EMERGENCE FROM PHYSICS TO THEOLOGY: TOWARD A PANORAMIC VIEW

by Philip Clayton

Abstract. At its best, the emergence debate provides a helpful model of what religion-science scholarship can and should involve. (At its worst it represents the faddishness and bandwagon effects to which our field is also prone.) Those involved in the debate must pay close attention to concrete theories and results in the natural sciences. They rely on the careful conceptual distinctions that philosophers of science draw concerning complexity, novelty, and organization. The resulting views about human mentality and consciousness are tested against these results and checked for their adequacy to the phenomena of human experience. Emergentist theories of nature and personhood have entailments for one's theory of religion and for theological reflection; conversely, theological accounts may constrain one's interpretation of emergent phenomena. In my response to the four symposiasts I draw out these deeper dimensions of the emergence debate.

Keywords: Terrence Deacon; divine action; emergence; God-world relation; Stuart Kauffman; neuroscience; phenomenology; philosophy of science; physicalism; theological anthropology; theory of evolution; transcendence versus immanence.

Emergence is in the first place a claim about the nature of the evolutionary process, about what natural history has produced. As scientists and philosophers of science grapple with the genesis of emergent novelty, students of science and religion recognize its importance for their own fields. In turn, they offer new interpretations of the source and telos of the emergent process of nature. If genuine emergence does not occur in the natural

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world, or if I am wrong and all instances of emergence are "weak" rather than "strong," all theological discussion of emergence is rendered otiose.

This symposium has both weighed the significance of this debate for the field of science and religion and advanced the debate itself. Because this particular discussion takes place largely within the context of theism, I should emphasize that one can pursue the discussion from the standpoint of a student of religion more generally—or, indeed, without any religious interests at all. The different understandings of the human person offered by the various emergence theories deeply affect one's understanding of human religiosity in general. Religious beliefs and practices take on a very different meaning if reductive physicalism is true, or weak emergence, or strong emergence. The difference between Pascal Boyer's interpretation of religion in *Religion Explained* (2001) and my view—and these differences are very great indeed—turns primarily on our different understandings of emergence in the natural world and on the different understandings of the human person that result.

Antje Jackelén

I am grateful for the typically astute and insightful comments of the first symposiast, Antje Jackelén—and not less because of the somewhat skeptical tone of her piece (see pp. 623–32 in this issue). Although she says she "likes" emergence, Jackelén nonetheless wonders aloud whether emergence is little more than an intellectual fad. She expresses doubts about its significance and, because there are competing models of emergence, she worries that what we call emergence may be an inconsistent position. Finally, even if there is a consistent position here, and the natural world actually is divided into a hierarchy of distinct levels, the view may still be morally and politically unacceptable because of the risk of "inadvertently promoting hierarchical views of society" (p. 629). Jackelén prefers "loops" and "tapestries" and "networks" to ladders. Evolution is better understood through "complex regular polytopes" (p. 631) than through emergence.

The tone of some her remarks surprises me, because we do agree that "the natural world exhibits a variety of levels at which distinct types of laws and causes can be recognized" (p. 631). Her title, "Emergence Everywhere?!" seems to imply that emergence is merely a bandwagon phenomenon. She concedes, "[Clayton] is aware of the risks of launching emergence as a 'magic pill' (p. 47), and he effectively counteracts any suspicion of faddishness by firmly lodging emergence in the realm of philosophy" (p. 624). Still, she worries, "Is emergence the magic wand that finally will bring about the great unified understanding of it all? Or, I ask, not without self-irony, is it merely a fad that, already abandoned by physicists, finally starts to excite the theologians?" (p. 624)

What significance does emergence have for the science-religion dialogue, for those who are not interested in fads? Many of us believe that some mistakes have been made in the interpretation of science *and* in the reactions against it. We believe that both reductionist-physicalist and dualist interpretations of evolution are mistaken. Emergence theory points to a space in between that more accurately describes the structural features of the natural world as they have unfolded. Yet one cannot just throw the term *emergence* against one's opponents; one has to do careful work to show where their mistakes lie and how an emergentist approach can do better. The difficult parts of my book are the places where I make this attempt. The goal is to develop a new position, or a set of competing positions, in a manner no less sophisticated than the physicalist and dualist philosophies—and that is a pretty high standard to meet.

In *Mind and Emergence* I distinguish three types of emergence: *façon de parler* emergence, weak emergence,[1] and strong emergence (Clayton 2004, chap. 2). Today, having been influenced by discussions with Michael Silberstein and Achim Stephan, I would actually distinguish four varieties of emergence: (1) weak and (2) strong epistemological emergence, and (3) weak and (4) strong ontological emergence. That is, our inability to reduce higher to lower levels (1) might merely reflect limitations in our theories and experimental methods or (2) might reveal inherently unknowable features of the natural world. Likewise, emergent units or wholes such as organisms (3) might reflect merely more or less stable structures in the natural world or (4) might be entities that are fully as real as quarks and muons. I continue to advocate strong emergence in both cases.

What then of Jackelén's main criticism? I do not intend any value judgment to be built into the term *hierarchy* as I use it. It merely means that there has been an increase in complexity over time. Natural history has produced this increase in complexity, which manifests in complex forms of natural dependence and irreducibility. But no scientist qua scientist can argue that the more complex natural systems—the ones that have more nested layers—are more valuable than the less complex ones. Judgments of value must be made by ethicists, theologians, and everyday people. Such judgments permeate the social world, the world structured by the human (or divine) construction of meanings and values. I do not think that Jackelén and I differ greatly in the sorts of value judgments we are drawn to make at this level.

For this reason, I beg to differ with Jackelén's remarks on emergent hierarchies. It is true that only organisms with central nervous systems of a certain level of complexity can develop and be influenced by cultural ideas and symbols. Still, the emergentist perspective means precisely that values questions in the human-cultural sphere cannot be resolved by (often hierarchical) biological facts. Indeed, attempting to resolve values issues "downward" in this fashion is precisely the (antiemergentist) mistake often made

by sociobiologists and evolutionary psychologists. Evolutionary psychology tends to underestimate the strong emergence that characterizes human behavior—or, to put it differently, the degree of difference between biological evolution and cultural evolution. Thus emergence should pull in precisely the opposite direction from Jackelén's ethical allegations.

Jackelén quotes the sentence from my book, "When basic physical, emotional, and social needs are met, humans invariably raise questions of the 'ultimate meaning of it all'" (2004, 192). In that passage I allude to the well-known hierarchy of needs developed by Jewish humanist psychologist Abraham Maslow. Jackelén replies to both Maslow and me with the ad hominem question "What is it that gives the quest for ultimate meaning articulated by, for instance, satisfied academics a higher place in the hierarchy than the cry for meaning out of the depths uttered by a person in great need?" (p. 630) But this is surely to miss the point of Maslow's hierarchy. Maslow does not value one person's "peak experiences" above another's. Rather, he, and I following him, is making the progressivist social point that *no person* can attain her full potential when her basic biological and social needs remain unmet. Is not this an entailment of emergence theory that one would want to endorse?[2]

JAMES HAAG

I welcome James Haag's invitation to dialogue with a more physics-based version of emergence, the theory of Terrence Deacon, nicely summarized by Haag (see pp. 633–47 in this issue). Deacon offers one of the most sophisticated theories of emergence in the recent literature, and I deeply respect his achievements. A complex blend of scientific results and philosophical interpretation of this sort is precisely what we must offer if we are to avoid Jackelén's fear that emergence is being used as a "magic wand." Unfortunately, Deacon's otherwise brilliant theory is incomplete in certain respects and needs to be supplemented.

First, however, a quick response to Haag's attempt to dismiss supervenience language. He argues that, because "supervenience language cannot express the essential distinctions"—I think he should have said "cannot express *all* the essential distinctions"—therefore "it seems wise for Clayton to jettison its use within his theory" (p. 642). I affirm the antecedent, at least as modified, and for the same reasons as Haag: supervenience does not tell us all we need to know about the nature and origin of mental properties. But the consequent does not follow. Supervenience serves at least three positive functions: it emphasizes the continuous dependence of the mental on the physical, reminds us that *part* of this dependence is synchronic, and tells a part of the story that no theory of mind (or anthropology) should ignore: the crucial connections between one's thought and one's brain. As a strong emergentist who affirms mental causation, I deny

that neurophysiology tells the whole story; like Jackelén, I affirm the "network aspect" of societies, cultures, emotions, and ideas. Yet surely an exclusively "horizontal" understanding of thought and emotion is empirically false. For if you damage the neurophysiological platform on which human agents run, you will detect synchronic changes in mental functioning. If I suffer a stroke while writing this sentence, you are less likely to be satisfied with the result. If an academic discussion takes place after a wine and cheese reception, when the participants have a higher ethanol content in their bloodstream, their criticisms are likely to be less astute, although they may seem more funny.

But back to the role of physics. Here I have to express a certain puzzlement about the overall thrust of Haag's essay. He wishes to emphasize "development from a physics base" (p. 634) and criticizes my view for not "constructing upward" from "a physics-based theory" of emergence (p. 645). At the same time he endorses a phenomenological method that depends crucially on first- and second-person accounts, and he appears to believe (following Michael Spezio) that "scientific accounts that favor the third-person perspective are incommensurable with first- and second-person accounts" (p. 644). These tensions are not resolved in the essay.

Haag and I agree that understanding mental properties requires one to include first- and second-person perspectives, which are "utterly indispensable" (p. 644). Haag also correctly stresses that "first- and second-person explanations typically come in the form of reasons," which he correctly identifies as a "sort of causation" (p. 644). Yet increasing the physicalist component in one's theory of emergence, as in Deacon's approach, stands in tension with Haag's (and my) belief that reasons and other mental states function as real causes in the world. A more physicalist approach would emphasize the causal closure of the physical (because of the conservation of energy), which implies that all causes are ultimately expressions of microphysical processes. It also would warn that, if mental processes are not expressions of microphysical causal processes, the problem of overdetermination is insoluble (Kim 2000). Physicalists generally resolve this problem by giving up on the (final) reality of mental causes.

If Haag shares my view on the irreducibility of mental causes, as he seems to, why would he then wish to replace strong emergence with a weaker version that is, as he puts it, "predominated by physics" (p. 634)? I suggest that in the essay Haag uses this expression in two different senses and that he unwittingly slides from the one sense to the other. Consider the sentence, "While [Clayton's] position claims that the mental is irreducible to the physical, it also acknowledges [a] the mental's dependence on the physical. This dependence gives predominance to physics [b] as necessary for a complete explanation of mental properties" (p. 638). One should indeed grant both [a] and [b], for higher-order natural systems do indeed remain dependent on lower-order laws, structures, and energies.

But it does not follow from the fact that physics plays a necessary role in explaining mental properties that physics is *sufficient*. Explanations of mental phenomena also must take account of mental causes and the role of persons as psychosocial agents in the world; and it just is not true that physics "predominates," or could predominate, in such explanations.[3]

Now I turn directly to Deacon's position. He describes thermo-, morpho-, and teleodynamics as three "orders" of emergence. Deacon and I agree that thermodynamics and the dynamics of form are necessary but not sufficient for explaining biological and psychological phenomena. Two main differences seem to divide us: exactly when teleodynamics first occurs and whether there are additional distinct orders of emergence in the natural world. The distinctions are reflected in two forthcoming articles (Deacon forthcoming; Kauffman and Clayton forthcoming). Deacon's "autocell" concept seems to imply that third-order emergence can occur at a prelife and even previrus level[4]; no new "order" is introduced when self-reproducing cells arise. By contrast, the five necessary conditions that Kauffman and I identify for minimal autonomous agents are probably met only by biological agents such as unicellular organisms. We focus on minimal biological agents as distinct natural structures with distinct types of causal interactions that require distinct modes of explanation. If Kauffman and I are right, "agency"—even in its most minimal form, at the cellular level—represents a *new* "order" or type of organization in the natural world. If teleodynamic structures are not agents in this minimal sense (and if they do indeed represent a distinct "topology," as Deacon believes), we would have to speak of living organisms as an additional order of emergence.[5] (Actually, I think we are both trying to describe the same emergent level—the third—but are diverging in our accounts of it. I hypothesize that the tools of semiotic analysis, derived from the work of C. S. Peirce and widely used in biosemiotics today, could help to resolve our differences.)

Let us think next of the sorts of processes that Deacon powerfully describes in his important book *The Symbolic Species* (1997). Wouldn't one need to construe the "co-evolution" of brains and language or culture as representing a new emergent order, a new "topology" in Deacon's terms? Surely the phenomenal features of brain-language interaction, and thus the causal factors necessary for explaining it, differ importantly from the order of complexity achieved in the origin of life. I would therefore defend the inclusion of a fourth level or order of emergence, which we might call "semantic" emergence—the emergence of interpreting agents, agents who are aware of themselves and who act with reference to self-conceptions of their own. The conceptual topology of semantic agency, I suggest, deserves to be distinguished from the "orders" that precede it. Comprehending it requires the sorts of uniquely *hermeneutical* tools that Jackelén, for example, has helpfully developed in her own work.

J. WENTZEL VAN HUYSSTEEN

The discussion so far suggests that there is something like a logic of emergence. For a given level of organization, L, emergentist claims concern the relation between L and (L+1). If one is working, say, at L_3, which gives rise to an emergent level L_4, one's attention must focus on the specific features of the relationship between L_3 and L_4. But if the empirical study of emergence is about the specifics of this relationship, its logic stands opposed to physicalism, for physics may or may not offer the best conceptual framework for conceiving the relationship between L_3 and L_4. This is why emergence is so significant for anthropology and the social sciences, where the distinctive problems are not about physics but about the relation between third-person neuroscientific theories and first-person phenomenological accounts.

This insight leads us to ask whether there might not be yet another level, the level of spirituality and spiritual realities. Is there a level of emergent deity? Assuming there is a God, how are human being and divine being related?

J. Wentzel van Huyssteen offers an excellent account of the transition from emergentist theories of science to questions of religious significance (see pp. 649–64 in this issue). Although he and I disagree on the epistemic priority of science for explaining empirical phenomena, he provides a sympathetic and accurate analysis of my position. He also offers intriguing hints of the position on human uniqueness that he defended in detail in his recent Gifford Lectures, which have just appeared as *Alone in the World?* Because there is a fair stretch of common ground here, it will be more interesting if I focus on the points where we might in the end differ.

Van Huyssteen interprets my position as maintaining that God can have no influence in the universe prior to the emergence of organisms that are conscious. By that point, I have argued, one detects a sufficient amount of spontaneity that some psychophysical organisms—perhaps only humans, but presumably also many other organisms evolutionarily prior to us—have enough degrees of freedom that they could respond to a divine lure without God actually determining their behavior. But, he worries, theologians cannot be limited in this fashion by the results of science; they should not be satisfied with a view that constrains God's scope of action to only some parts of the natural world.

Let me take up this challenge. For the nontheistic reader I emphasize that emergence does not require a preexisting God or even an emergent deity, and it does not presuppose divine action in the world. Still, suppose that one does believe that this universe was created by an intelligent divine being. In setting up the basic cosmological principles that define this universe's history, God could establish laws, tendencies, and initial conditions such that it was likely (or highly likely, or virtually inevitable) that

intelligent life would naturally arise over the course of cosmic history. If "convergent evolution" (Conway Morris 2003) is correct, God could have arranged the creative order in order to reliably achieve certain divine goals by means of it, without requiring additional interventions on God's part. On this point, van Huyssteen and I do not disagree.

We do disagree if, as sometimes appears in his text, van Huyssteen is asserting that God, having once set the world in motion, also acts to change the outcomes of physical or chemical systems. Call this *counterfactual divine action*—additional interventions by God that cause the outcome of physical and chemical processes to be different than they would otherwise have been. I am clearly denying counterfactual divine action at physical and chemical levels. I deny it not because I believe God is metaphysically incapable of altering such systems; in fact, I assume that God *could* change these systems if God chose to. Instead, I am forced to this conclusion by considerations concerning the problem of evil (Clayton and Knapp forthcoming). If God once changed the outcome of a physical process—say, God diverted a falling boulder out of the way so that it did not fall on a group of hikers—wouldn't God be responsible for not similarly diverting falling rocks from all other groups of hikers? For that matter, wouldn't God be responsible for not preventing the loss of innocent life also in the case of landslides, mudslides, avalanches, earthquakes, tsunamis, hurricanes, and so forth—in short, for not intervening in physical processes in all cases where suffering could thereby be avoided or reduced?

Yet God does not consistently intervene in this way. Moreover, were God consistently to act in this fashion to reduce or eliminate suffering, the conditions for the emergence of finite agents would not be met, for the order and regularity required for us to develop and exercise agency would be missing. Thus, Knapp and I accept the "not even once" principle: If God wishes for finite agents to develop over evolutionary history, God cannot coercively alter the outcome of any purely physical or chemical system at any time. (Whether God can lure biological organisms without coercion depends on one's understanding of those organisms at each stage of evolution. If they are more like physical and chemical systems, the same prohibition applies to them, whereas if the organisms are more like human agents—that is, agents who synthesize complex sets of lures and influences into self-chosen courses of action—noncoercive divine influence would be possible.)

The loss of interventionist miracles is a hard cost to pay for traditional theists. But after a period when it seemed impossible to many to maintain *any* account of divine action, it is encouraging to have found a framework that allows one to speak of divine action in at least some spheres, as I have done, without conflicting with scientific results or methods. Emergence provides a way for theists to speak of the response of agents to the divine while remaining consistent with the scientific study of natural history.

STEVEN CRAIN

We turn finally to Steven Crain's interesting constructive theological proposal (see pp. 665–73 in this issue). In the end, I do not think his view of the God-world relation is all that distant from the constructive theology on which I have been working (cf. p. 670). The disagreement turns instead on his claim that the resources of classical philosophical theism are sufficient to provide the conceptual underpinning for this position. I have three questions about this claim.

First, I fear that even the more "radical" sense of transcendence advocated by Crain is not sufficient to establish the deeper level of immanence that I and other panentheists seek to express in our theologies. In the attempt to deemphasize the conceptual differences between emergent panentheism and classical philosophical theism (CPT), Crain turns to Kathryn Tanner's "non-contrastive" characterization of divine transcendence (p. 669) as an ally: "God transcends the world not only by virtue of not being part of or identical to the world but also by virtue of not being alongside of and separate from the world. Neither identical to nor outside of and separate from the world—this is noncontrastive transcendence" (p. 669). In the double negative one hears overtones of the Hindu *neti, neti* ("not this, not that") and, possibly, of apophatic theology. One can, of course, opt out of philosophical theology and indeed out of rationality altogether. But if one wishes to do philosophical theology, one accepts the obligation to provide a positive account—a philosophically sustainable position—of how divine immanence might work. As far as I can tell, Crain's radicalized transcendence does not provide this account. A more radical doctrine of transcendence does challenge the claim that God needs the world (or any world); hence "God can be God without the world's having to exist at all." Moreover, *if* God were to create a world, the creative act, not being a product of necessity, would have to be interpreted as "grace" (p. 670). But free creation and grace are not by themselves sufficient to establish a more radical understanding of divine immanence in the world.

At the crux of his argument, Crain writes, "In sum, were God not the creator of a world that did not have to be, God's transcendence of the world would not be 'radical,' and God could not therefore be the creator of a world in which God is thereby intimately present precisely as its creator" (p. 670). The first clause, as we have already seen, makes sense, but how does radical transcendence entail the second? The sentence seems to say that *only* in a theology of radical transcendence and free creation—and therefore not in, say, a process theology that accepts panentheism and a necessary creation—can God be intimately present. But why should one accept this claim? In fact, is not the opposite true? In a theology of radical transcendence, immanence will be *harder* to establish, whereas in a theology conceived from the ground up in terms of radical immanence, immanence should be easier to defend conceptually.

Elsewhere Crain argues that, given radical transcendence, "both the divine presence in the world and divine action in the world are nonintrusive, noninvasive, and noninterventive" (p. 670). But how do these three key qualities follow from a doctrine of transcendence, however radical? It is true that, if creation is free, God gives the world "the gift that might not have been: the gift of being" (p. 670). But that alone is surely a rather truncated sense of divine immanence, especially when one contrasts it with the rich descriptions of divine immanence reflected in the biblical documents and the intimate internal divine lure advocated by (for example) process theology.[6]

Second, it is difficult to see why Crain would think that "emergent panentheism and the metaphor *The world is the body of God* sever [the] connection" between God's immanence and the divine act of creation (p. 671). A central goal of panentheism is to *strengthen* the dependence of the world on its creative Source over against CPT; it is for this reason, for example, that panentheists conceive the world as being located within the divine rather than as a separate finite reality outside the divine. Whether one looks at the panentheism of F. W. J. Schelling's *Of Human Freedom* (1936) or Charles Hartshorne's criticisms of Scholastic theology (1984), one finds new conceptual means, not present within CPT, for conveying more intimate relations between God and world (Clayton 2000, chap. 9). By contrast, a classical doctrine of creation may obscure the depth of the bidirectional relationship of Creator and creation, as in this passage from Thomas Aquinas:

> Now a relation of God to creatures *is not a reality in God* but in the creature, for it is in God in our idea only; just as what is knowable is so called with relation to knowledge: not that *it* depends on knowledge, but because knowledge depends on *it*. Thus it is not necessary that there should be composition in the supreme good, but only that other things are deficient in comparison with it. (*Summa Theologica*, Q6, a2, reply to First Objection)

Third, Crain closes by emphasizing that "God is the body of the world" (pp. 671–72).[7] The beautiful way in which he develops this metaphor, I suggest, stands much closer to the logic of panentheism than to CPT. For example, he wishes to say that "God bodies forth the world, continuously sustaining and energizing its story, especially its human stories, from within" (p. 672). The question is: Where does one find conceptual resources adequate to conceive what Crain (and I) seek here? Is not a philosophical theology based on a doctrine of internal relations, such as one finds in Whitehead, much better suited to accomplishing this task than a metaphysics of substances in the Patristic sense, which by definition can only be externally related to each other? Elsewhere Crain stresses the divine humility: God provides a service that "lifts up the one served through bowing beneath her and bearing her" (p. 672). But is not this language much more compatible with "kenotic trinitarian panentheism" than with the

classical language of God as the highest substance (Clayton 2005)? Crain's beautiful phrases are reminiscent of the twofold "in" of recent panentheism (Clayton and Peacocke 2004). For example, Jürgen Moltmann's panentheistic doctrine of creation employs powerful (though decidedly not classical) metaphors for conveying the same insights. In *God in Creation* (1993) Moltmann relies on the Kaballistic concept of *zimzum* and the feminine metaphor of the world as existing within the womb of God. Indeed, doesn't the full symmetry of Whitehead's understanding of the God-world relationship—"It is as true to say that God is within the world as it is to say that the world is within God" (Whitehead 1978, 348)—offer a much more effective conceptual means for achieving these goals than a metaphysics of substance?

In short, Crain and I do not seem to differ on the theology we would like to defend. Contemporary theology should indeed strive to understand how "God empowers the world from within, especially in bringing human free agents among God's creations" and how God is "continuously sustaining and energizing [the world's] story, especially its human stories, from within" (p. 672). What is unclear is how the notion of radical transcendence gets one there. Although a free, contingent creation may well be a necessary condition for achieving this goal, it is not sufficient. Crain's essay, at any rate, does not appear to derive the sort of radical immanence he seeks from the doctrine of creation by a transcendent God. In order to fulfill *this* task, I suggest, philosophical theologians need a well-developed theory of the divine participation in the world and the world's participation within the divine life. The Neoplatonic and process traditions (to name just two candidates) offer such a theory, and I have elsewhere sought to ground it in kenotic trinitarian panentheism. But all of these theologies use resources outside CPT.

Conclusion

Taken as a whole, these five papers have covered a rich variety of topics: the strengths and weaknesses of emergence language in the sciences; choices between competing emergence theories in the philosophy of science; theoretical alternatives to emergence; and the possible implications of emergence for understanding evolution, life, consciousness, human nature and personhood, ethics, human religiosity and spirituality, the question of God, God's relationship to the world, and divine action—certainly as ambitious a symposium as one could hope for.

Each reader will evaluate the arguments differently and will place her vote. As Jackelén rightly notes, "there is a cost to walking the tightrope of the double commitment to maximal empirical testability and metaphysical minimalism. In one way or another, this is the price that cannot be avoided in religion-and-science" (p. 626).

Nonetheless, I suggest that, however one votes, the intense debate surrounding emergence today is a sign of the vitality and importance of debates that span the entire scale from science to religion. Listening carefully to the sciences, attempting to integrate across scientific disciplines, drawing on philosophical analyses and distinctions, seeking to do justice to the rich data from religious studies, and debating the theological alternatives found across cultures and history—combining these activities makes for the most comprehensive, and therefore the most adequate, perspective one can achieve on questions of the ultimate nature of reality. Emergence may not be the final telos of the religion-science debate; indeed, one should be suspicious of *any* claims to know the final outcome of debate on topics as complex as these. Nevertheless, it continues to nicely focus discussion of the core issues, and perhaps it has moved the debate a bit further along. This in itself is no mean achievement.

NOTES

A version of this essay was presented at a religion-and-science session during the annual meeting of the American Academy of Religion, Philadelphia, 19 November 2005.

1. "Weak emergence" is not a pejorative; the term goes back to Mark Bedau (1997), who endorses the view.
2. It is also not true that I derive God from emergence. Emergence by itself does not prove God. This point is dealt with in more detail below.
3. I cannot recognize my position at all in Haag's description of what I do *instead of* granting the predominance of physics: "For Clayton, it is impossible to begin with physics and end with phenomenology; instead, we must begin with phenomenology and deconstruct our way back down to physics," or "Clayton identifies the agent phenomenologically and then seeks bridging rules to allow for a 'downward' path toward physics" (p. 645). Neither of these is an accurate expression of how the argument proceeds in *Mind and Emergence*.
4. In earlier presentations of his work (including Deacon 2003), Deacon tended to speak of third-order emergence as coextensive with the origin of life. I take the autocell article to represent a shift of position, however subtle.
5. It appears that Haag's essay actually breaks from Deacon's analysis, though without clear acknowledgment of doing so. He first describes Deacon's three types of processes. But then, in complete parallelism with Deacon's three orders, and in the same sentence, he goes on to speak of "evolutionary processes" and "semiotic" processes (p. 641). Are these not new, emergent orders of organization in the natural world, beyond Deacon's thermo-, morpho-, and teleodynamic processes? These "evolutionary processes" sound more similar to what Kauffman and I mean by our account of the "minimal autonomous agents" on which natural selection operates. Does Haag's essay not therefore imply that evolutionary processes are a fourth fundamental level or order in natural history?
6. In the version of Crain's paper presented to the American Academy of Religion, he wrote that God's being "nearer to us than we are to ourselves . . . necessarily requires that we . . . conceive of God as the One who continuously bestows the gift of being to all that exists." That could well be. But to say that divine creation (or even *free* divine creation) is a necessary condition for a full theology of immanence is not to say that it is *sufficient*. This Crain has not shown.
7. Crain also explores the analogy of the world as the body of God. As a panentheist, I have employed and endorsed this model (see Clayton 1997; 2001; 2005). But the classical philosophical theism within which Crain is working does *not* endorse emergent panentheism in this sense. Thus Crain has to write, "For just as the human mind, because it emerges from the body, can thereby act through the body, so God, *as if* emergent from what is analogous to God's body—namely, the world—can act within that world" (p. 671; emphasis added). Adding the

phrase "as if" is necessary, because for CPT God is not actually emergent from (something like) God's body. But if the two terms are not actually analogous, the conclusion ("so God . . . can act within that world") does not follow.

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