

God and the World of Signs: Semiotics and the Emergence of Life

with Andrew Robinson and Christopher Southgate, "Introduction: Toward a Metaphysic of Meaning"; Christopher Southgate and Andrew Robinson, "Interpretation and the Origin of Life"; Bruce H. Weber, "Selection, Interpretation, and the Emergence of Living Systems"; Jesper Hoffmeyer, "A Biosemiotic Approach to the Question of Meaning"; Robert E. Ulanowicz, "Process Ecology: Stepping Stones to Biosemiosis"; Andrew Robinson and Christopher Southgate with Terrence Deacon, "Discussion of the Conceptual Basis of Biosemiotics"

INTRODUCTION: TOWARD A METAPHYSIC OF MEANING

by Andrew Robinson and Christopher Southgate

Abstract. We introduce a two-part collection of articles (Part 2 to appear in the September 2010 issue) exploring a possible new research program in the field of science and religion. At the center of the program lies an attempt to develop a new theology of nature drawing on the philosophy of C. S. Peirce. Our overall idea is that the fundamental structure of the world is exactly that required for the emergence of meaning and truth-bearing representation. We understand the emergence of a capacity to interpret an environment to be important to the emergence of life, and we see the subsequent history of biological evolution as a story of increasing capacities for meaning making and meaning seeking. Theologically, we understand God to be the ground of all such meaning making and the ultimate goal of the universe's emerging capacity for interpreting signs. Here we explain our reasons for seeking a new metaphysical framework in which science and theology may each find a home. We survey the contributions to the two-part collection, and we suggest that the interdisciplinary collaboration from which these have arisen may serve as a methodological model for the field of science and religion.

Keywords: interpretation; meaning; metaphysics; C. S. Peirce; research program; science and religion; semiotics

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This is Part 1 of a two-part collection of articles, Part 2 to appear in the September 2010 issue. Taken together, these represent a snapshot of the current state of what we hope is a significant new research program in the field of science and religion.¹ At the center of the program lies an attempt to develop a new theology of nature drawing on the semiotics (theory of signs) and metaphysics of American scientist, semiotician, and philosopher C. S. Peirce (see Robinson in press). The program amounts to a proposal for a new metaphysical framework within which explorations in both theology and science might find a home. In essence, the framework is a metaphysic of meaning. Our overall idea, one with profound theological undertones, is that the fundamental structure of the world is exactly the structure that is required for the emergence of meaning and truth-bearing representation. We understand the emergence of entities capable of interpreting their environments to mark the emergence of life, or at least of protolife, and we see the subsequent history of biological evolution as a story of increasing capacities for meaning making and meaning seeking. Theologically, we understand God to be the fundamental ground of the possibility of all such meaning making and the ultimate goal of the universe's emerging capacity for interpreting signs.

Why the need for a new metaphysical framework, and why a metaphysic of meaning? Our initial motivation for exploring the field of semiotics and its metaphysical ramifications arose in the context of questions about whether Christian theology remains coherent when examined in the light of evolutionary biology. Consider the story of the Earth in terms of an analogy with a 450-page book.² Our planet is about 4,500 million years old, so each page of the book represents 10 million years of terrestrial history. Life originated relatively early on, perhaps on about page 70 (about 3,800 million years ago). For more than half the book life consisted of nothing more complex than single-celled organisms. Complex multicellular organisms appear about 60 pages from the end. Just six pages from the end the dinosaurs go extinct as a result of a meteorite impact, leaving the way open for the adaptive radiation of mammals into the vacated ecological niches. If that chance event had not occurred the dinosaurs might still dominate the Earth; mammals would still be small and nocturnal, and humans would not have evolved. Half a page from the end of the book the hominid line splits from the line from which chimpanzees are descended, and anatomically modern humans appear only in the very last line. The whole narrative of biblical history from Abraham to the present—something over 3,000 years—would be compressed into the last letter of the last page. Traditional Christian theology has held that humanity is important, indeed central, to God's creative purposes. Evolutionary biology appears to tell us that humanity might never have existed. If the tape of life were rerun over and over the outcome would never be the same (Gould 1991).

One possible theological response to this evolutionary narrative is to argue that although the specific outcomes of evolution are not predictable, there are generic outcomes that can be more or less guaranteed (Conway Morris 1998). Humanity might not have arisen in the particular form in which we exist, but conscious beings would have done. The question then arises, is consciousness really a generic phenomenon, or do modes of cognition depend more specifically on exact forms of embodiment? Furthermore, if something resembling human consciousness was the goal, what was God up to for the other 449+ pages of the book, not to mention the two equally large preliminary volumes between the Big Bang and the formation of the Earth? Wasn't there a simpler and less costly way of getting to the last line of page 450? These questions lead us to look for a modified version of the consciousness-as-generic-goal-of-evolution kind of argument. Is there a biologically plausible and theologically satisfactory property or process that could be regarded (theologically) as a truly generic goal of evolution? Furthermore, can such a property or process be understood to be in continuity with the rest of biological evolution (and the prebiotic history of the universe) in such a way that its full or distinctive emergence in humans appears to be in some sense a continuation and fulfillment of the evolutionary process rather than a peripheral curiosity?

The field of biosemiotics offers the prospect of just such a property (see Hoffmeyer 1996; Wheeler 2006). Semiotics is the field of the study of sign processes.³ Biosemiotics is concerned with the place of signs, interpretations, and meanings in biological processes. The biosemiotic perspective regards sign processes as a generic feature common to all living things. The most obvious, although controversial, example is that of the genetic "code." Life as we know it on Earth makes use of the capacity of large biomolecules, particularly DNA, to code for (represent) the sequence of amino acids that makes up a corresponding protein. The cell interprets the DNA sequence in order to make the protein. At the other end of the biological "scale" semiotics also can contribute to understanding the basis of human distinctiveness, which arguably rests on our capacity to use semiotic processes in other ways—including the capacity to communicate by means of language (Deacon 1997). From a biosemiotic point of view, the evolutionary process consists of a growth in the extent and variety of the manifestations of the generic process of semiosis (Hoffmeyer 1996). Semiotics may thus offer a resource for a theological response to the apparent implications of evolutionary theory mentioned above. We can imagine reruns of the evolutionary story in which humans would not have evolved in the exact form of *Homo sapiens* and yet hold that the evolutionary process was nevertheless likely to lead to creatures with richly developed capacities for sign making and sign interpretation. Furthermore, such capacities may be understood as a natural development from earlier and simpler forms of semiosis. Humans

are genuinely distinctive, yet our distinctiveness is in continuity with, and deeply rooted in, the rest of the living world.

Some philosophers of biology are skeptical about whether the biosemiotic perspective is scientifically and philosophically sustainable. Skeptics argue that the terminology of signs, meanings, and interpretations to fundamental biological processes is merely a shorthand convenience, not a reflection of an underlying reality about biology (Oyama, Griffiths, and Gray 2001, 5). According to this view, semiotic terminology in biology could be entirely replaced with accounts in terms of mechanistic causes and effects. The challenge posed by these critics of biosemiotics is to show how semiotic concepts offer any explanatory advantages over a purely mechanistic account. Another way of putting this is to ask whether biosemiotic thinking gives rise to testable scientific hypotheses that cannot be framed merely in terms of mechanistic causes and effects.

The first article in Part 1 of this collection summarizes our own attempt to respond to the challenge of demonstrating the scientific relevance of the biosemiotic perspective. We focus on the question of the simplest entity capable of making an interpretation of some aspect of its environment, analogous to an amoeba's interpreting the presence of a chemical attractant molecule as a sign of "food" in that direction. We explain our proposal for a new general definition of interpretation. This definition, we argue, shows why interpretative responses are irreducible to merely mechanistic explanations, and we suggest how this gives rise to testable hypotheses about the origin of life. This work is, we hope, of considerable scientific interest in itself. In addition, the philosophical and scientific fruitfulness of the program would encourage and support the kind of theological appropriation of a semiotic view of nature that constitutes our wider project.

Our essay is followed by a response by Bruce Weber, who examines Terrence Deacon's concept of an autocell (which is the basis of one of our own empirical tests of our definition of interpretation) within the wider context of the current state of the field of origin-of-life research. These initial articles focus narrowly on the task of developing a philosophically robust and scientifically useful definition of interpretation.

The next two broaden the perspective. Jesper Hoffmeyer, one of the founders of biosemiotics, shows how semiotic and biosemiotic thinking requires a relational ontology. He offers a biosemiotic account of evolution, according to which the growth of "semiotic freedom" is understood to be an essential aspect of evolutionary dynamics, and gives a semiotic perspective on the concept of emergence. Without an emergentist theory of meaning, he argues, science cannot give an account of the origin of intentionality and subjectivity, the "me-ness" of me. Robert Ulanowicz remarked, during the conference from which these articles emerged, that some of the resistance to the biosemiotic paradigm might be overcome by approaching it from the perspective of process thought, suggesting that

process philosophy may provide a stepping stone to a semiotic metaphysic. His essay offers a sophisticated analysis of why the prevailing post-Enlightenment mechanistic metaphysic is beginning to unravel. In its place he explores an ontology of process as way of understanding the emergence of life. This “process ecology,” he suggests, “paves the way for Hoffmeyer’s top-down apologetics to be buttressed by a bottom-up description of the emergence of biosemiotics.”

Part 1 ends with a dialogue between ourselves and Deacon about the differences between our own approach to biosemiotics and the eight “theses” recently proposed by a group of biosemioticians, including Hoffmeyer and Deacon, as a step toward formulating a coherent conceptual basis for biosemiotics. The discussion gives a flavor of the complexity of the issues at stake. Such detailed involvement in disputed areas of science is perhaps not normally expected as part of the science-and-religion enterprise and reflects the ethos of the Science and Transcendence Advanced Research Series (STARS) program—on which more below.

Having explored in some depth, in Part 1, the scientific and philosophical promise of the field of biosemiotics, we turn in Part 2 (to appear in the September 2010 issue)⁴ to develop some theological aspects of our research program. We begin by setting out a summary of our semiotic approach to trinitarian thought and incarnational theology. Two integrating themes in our essay, and in the framework as a whole, are the sense in which semiotic processes in nature may be understood as vestiges of the Trinity in creation and the question of how creaturely semiosis may be understood as a mode of participation in the divine life. F. LeRon Shults responds, suggesting other theological directions in which Peirce’s philosophy may lead. He emphasizes the way in which religious symbols are potentially transformative for human lives and are themselves in perpetual need of transformation. We in turn respond to some of Shults’s specific criticisms of our approach. Jeremy Law then reflects on some of the implications of the philosophical and scientific work in Part 1 by developing a “theology of boundary.” Finally, Philip Clayton draws Parts 1 and 2 together with a critical afterword.

The STARS venture, organized by the Center for Theology and the Natural Sciences (CTNS) and generously funded by the John Templeton Foundation, has been innovative in sponsoring work that seeks to do more than merely to identify coherences between scientific and religious accounts of ultimate reality, or to develop religious insights from scientific thought. The STARS vision is to promote work involving fundamental reevaluation of areas of philosophy, science, or theology in such a way as to lead to constructive new thinking and/or experimental work in all three fields in parallel. The interdisciplinary research project that we began to develop over a decade ago has proved to be particularly consonant with the STARS ethos, and we express our gratitude to CTNS and the Templeton Foundation for

the way in which the methodology encouraged by their program has enabled our work to bear fruit. We also are grateful to the many scholars who have helped us to sharpen our thinking over the years, including those who have contributed essays to the present collection. We emphasize that the willingness of colleagues to engage in debate with us and to publish their ideas alongside and in dialogue with us in this collection does not necessarily imply acceptance or endorsement of our overall theological aims.

At the 2008 meeting of the European Society for the Study of Science and Theology (ESSSAT) in Sigtuna, Sweden, Willem B. Drees presented a major challenge to the science-and-religion community by raising serious questions about whether current work in the field could genuinely be considered to represent a progressive research program (Drees 2010). We offer the interdisciplinary research collaboration reported here as a model of an innovative method for the field, as well as a bold proposal for a new metaphysical framework within which science and religion might each find a home.

NOTES

1. The essays stem from an invited consultation, "Semiotics, Metaphysics, and the Emergence of Life," that took place in Berkeley, California, in November 2008.
2. This illustration was first used in Southgate, Negus, and Robinson 2005.
3. The semiotic processes themselves—the operation of signs as opposed to the study of them—is sometimes referred to as *semiosis*.
4. Essays in Part 2 include Andrew Robinson and Christopher Southgate, "Semiotics as a Metaphysical Framework for Christian Theology"; F. LeRon Shults, "Transforming Theological Symbols"; Andrew Robinson and Christopher Southgate, "Broken Symbols? Response to F. LeRon Shults"; Jeremy Law, "Toward a Theology of Boundary"; and Philip Clayton, "Critical Afterword."

REFERENCES

- Conway Morris, Simon. 1998. *The Crucible of Creation*. Oxford: Oxford Univ. Press.
- Deacon, Terrence. 1997. *The Symbolic Species*. Harmondsworth, U.K.: Penguin.
- Drees, Willem B. 2010. *Religion and Science in Context: A Guide to the Debates*. London: Routledge.
- Gould, Stephen Jay. 1991. *Wonderful Life: The Burgess Shale and the Nature of History*. Harmondsworth, U.K.: Penguin.
- Hoffmeyer, Jesper. 1996. *Signs of Meaning in the Universe*. Bloomington: Indiana Univ. Press.
- Oyama, Susan, Paul E. Griffiths, and Russell D. Gray. 2001. "Introduction: What Is Developmental Systems Theory?" In *Cycles of Contingency: Developmental Systems and Evolution*, ed. S. Oyama, P. E. Griffiths, and R. D. Gray, 1–11. Cambridge: MIT Press.
- Robinson, Andrew. In press. *God and the World of Signs: Trinity, Evolution and the Metaphysical Semiotics of C. S. Peirce*. Leiden: Brill.
- Southgate, Christopher, Michael Robert Negus, and Andrew Robinson. 2005. "Theology and Evolutionary Biology." In *God, Humanity and the Cosmos: Second Edition Revised and Expanded*, ed. C. Southgate. London and New York: T&T Clark.
- Wheeler, Wendy. 2006. *The Whole Creature: Complexity, Biosemiotics and the Evolution of Culture*. London: Lawrence and Wishart.