C. S. Peirce as Resource for a Theology of Evolution

CONTINUITY, NATURALISM, AND CONTINGENCY: A THEOLOGY OF EVOLUTION DRAWING ON THE SEMIOTICS OF C. S. PEIRCE AND TRINITARIAN THOUGHT

by Andrew J. Robinson

Abstract. The starting point for this article is the question of the relationship between Darwinism and Christian theology. I suggest that evolutionary theory presents three broad issues of relevance to theology: the phenomena of *continuity*, *naturalism*, and *contingency*. In order to formulate a theological response to these issues I draw on the semiotics (theory of signs) and cosmology of the American philosopher Charles Sanders Peirce. Peirce developed a triadic theory of signs, underpinned by a threefold system of metaphysical categories. I propose a semiotic model of the Trinity based on Peirce's semiotics and categories. According to this model the sign-processes (such as the genetic "code") that are fundamental to life may be understood as vestiges of the Trinity in creation. I use the semiotic model to develop a theology of nature that addresses the issues raised by evolutionary theory. The semiotic model amounts to a proposal for a new metaphysical framework within which to understand the relationship between God and creation and between theology and science.

Keywords: creation; evolution; metaphysics; Charles Sanders Peirce; semiotics; Trinity.

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[*Zygon*, vol. 39, no. 1 (March 2004).]
 ISSN 0591-2385

EVOLUTION AND THEOLOGY

Evolutionary theory presents several issues of relevance to theology. I suggest that these may be classified into three main themes. The first is the phenomenon of evolutionary *continuity*. What are the implications of the connectedness of everything within the cosmos, and how does this affect our view of the place of humanity in relation to the rest of nature? The second is the issue of *naturalism*. If evolutionary theory offers comprehensive natural explanations for the way the world has developed, what place is there for the idea of the providential action of God? The third is the theme of *contingency*. If the course of evolution is characterized by a high degree of chance, what sense can be made of the notion of any divine purpose or plan for creation?

Each of these three themes may be thought of as corresponding to a phase in the evolution of Darwinism. The first such phase was the period from the publication of *The Origin of Species* (1859) to the early twentieth century. Although there had been significant evolutionary theories and debates before *The Origin of Species*, particularly in the first half of the nineteenth century (Brooke 1991, 226–74), it was Darwin's work that succeeded in convincing both the scientific community and the wider public of the fact that all species are related to one another. Darwin's phrase "descent with modification," which he preferred to the term "evolution," sums up clearly the concept of evolutionary continuity. However, although the effect of the publication of Darwin's theory was a rapid acceptance of the hypothesis of descent with modification, ignorance of the basis of inheritance weakened the case for Darwin's proposed mechanism of evolution, natural selection. Indeed, at the beginning of the twentieth century Darwinism, in the sense of the notion of evolution by natural selection, was widely thought to be on its deathbed (Depew and Weber 1995, 169–70).

The second phase of Darwinism, beginning in the early twentieth century and coming to fruition in the 1930s and 40s, followed from the synthesis of the concept of natural selection with the rediscovered theory of inheritance of Gregor Mendel. This "neo-Darwinian" synthesis resulted in mathematical demonstrations of the potential power of selection acting on small heritable variations and thus confirmed the likely importance of natural selection as an explanation of evolutionary change. By demonstrating that natural selection provides a credible natural explanation of the mechanism of evolution, neo-Darwinism marked the end of any role for vitalistic notions, such as Henri Bergson's *élan vital*, within mainstream biology (Mayr 1985, 47). The second phase in the evolution of Darwinism may therefore be characterized by its affirmation of the adequacy of ontological naturalism for explanations of the evolutionary process, even though the precise role of natural selection has subsequently become a matter of debate.

A third phase in the history of Darwinism may be thought of as originating around the 1970s with various pressures on the neo-Darwinian synthesis (Depew and Weber 1995, 14). A feature common to all of the consequent expansions of the neo-Darwinian synthesis is the theme of contingency. As David Depew and Bruce Weber say of current evolutionary biology,

> Just as Darwin's work exploded the Victorian's cozy sense of space and time, so contemporary evolutionary speculation is forcing twentieth century Darwinians to adjust to the even more expansive, chancy, contingent worldview that is already present in modern cosmology but that has so far been contained in evolutionary biology by the comforting rationalism of our talk about adaptations, according to which, even if we do not invoke God, we still seem to be able to give good reasons for what we see around us. (Depew and Weber 1995, 15)

This essay outlines a proposal for a new approach to the theology of evolution which attempts to offer a response to all three of the themes identified above. The proposal draws on the field of semiotics (the study of signs) to develop a new way of thinking about the Christian doctrine of the Trinity. I call this a semiotic model of the Trinity. The model amounts to a proposal for a new metaphysical framework within which to understand the relationship between God and creation and between theology and science.

Semiotics and Biology

The starting point for this new approach to the theology of nature is the observation that many biological processes depend on phenomena involving information or meaning. In other words, biological processes often appear to have a semiotic character. A well-known example is the genetic code, in which nucleic acid triplets specify the amino acid sequence of proteins in a manner that is not determined by any chemical necessity. Furthermore, the cellular processes that are involved in the utilization of this code are referred to by intrinsically semiotic terms such as "transcription," "translation," "messenger" and "editing" (Emmeche and Hoffmeyer 1991, 3). "Signalling" mechanisms between and within cells also appear to involve semiotic phenomena. For example, the functional effects of hormones, growth factors, neurotransmitters, and other "first messengers" are not directly determined by their chemical properties but are mediated by a set of intracellular "second messengers." Moreover, a multitude of intracellular signalling functions are accomplished by just four such second messengers: cyclic AMP, calcium ions, inositol triphosphate, and diacylglycerol (Barbieri 2003, 106). It is possible that these molecules originally were present merely as metabolic by-products but subsequently acquired semiotic functions during evolution (Tomkins 1975). Above the cellular level, whole organ systems may be involved in information processing. For example, it has been suggested that the function of the immune

system is analogous to the grammatical structure of language and that it is plausible to regard the immune system as performing a "cognitive" function concerned with distinguishing self from nonself (Jerne 1984; Sercarz et al. 1998).

In addition to the empirical observation of the apparent presence of semiotic processes in nature, theoretical considerations support the notion that life is a fundamentally semiotic phenomenon (Emmeche 1998). It is widely held that an understanding of the origin of life will require a synthesis of the fields of thermodynamics, self-organization, and information theory (Brooks and Wiley 1988; Wicken 1987, 31–32). The notion of a living agent that is able to interpret its environment in order to act on its own behalf implies some sort of semiotic capability (Kauffman 2000, 109–18). It is a matter of debate whether such a capacity would have required the existence of a cellular structure (Hoffmeyer 1998) or whether the simplest signs could have evolved at a molecular level, such as in a simple autocatalytic system (Pattee 1969). It has been suggested that, after the origin of life, a logical requirement for any system to be capable of both reproduction and evolution is that the system must include some sort of memory of itself (Von Neumann 1966; Hoffmeyer and Emmeche 1992; Etxeberria and Ibáñez 1999).

In spite of the widespread use of implicitly semiotic terms in biology some philosophers are critical of the use of the concept of information in biological contexts. For example, according to developmental systems theory the idea that the genome contains information is both redundant and misleading (Oyama 1985; Griffiths and Gray 1994). According to this view, rather than functioning as a central controller of development, the nucleotide sequence in the genome should be regarded as merely one developmental resource among others. Developmental systems theory is undoubtedly justified in drawing attention to the fact that the notion of biological information often is applied uncritically in biology. One reason for this unquestioning use of semiotic terminology is the lack of any universally agreed and biologically appropriate definition of *information*. For example, Shannon and Weaver's (1949) definition of information often is appropriated without regard to the fact that their mathematical theory concerns the structural content of a message (its syntax) rather than the basis of its meaning (its semantics) (Qvortrup 1993; Harms 1998). What is required, it seems, is a more general theory of the nature of signs and signification. *Biosemiotics* is a field of theoretical biology, many of whose advocates hold that the basis of such a theory is to be found in the triadic semiotics of the American philosopher Charles Sanders Peirce (1839–1914) (Anderson et al. 1984; Eder and Rembold 1992; Hoffmeyer 1996).

Semiotics. The most general definition of a sign is contained in the medieval formula "something that stands for something else" (*aliquid stat pro aliquo*). The basis of Peirce's contribution to semiotics was his proposal that this dyadic definition of the sign should be replaced with a triadic conception. Peirce suggested that signs consist of a relation between three elements: a *repre-sentamen*, which stands for an *object*, and does so by virtue of the mediation of an *interpretant*. According to Peirce, this semiotic triad is irreducible: "its three members are bound together by it in a way that does not consist in any complexus of dyadic relations" (Peirce 1998, 273). Peirce used the term *interpretant* in order to emphasize that signs do not depend on the presence of a conscious *interpreter*. Peircean semiotics therefore differs from the implicitly anthropocentric tradition deriving from Ferdinand de Saussure (1857–1913), for whom the dyad of *signifier* and *signified* are necessarily held together in the mind of the sign user (Saussure 1959, 66). Peirce, in contrast, speculated that "the entire universe . . . is perfused with signs, if it is not composed exclusively of signs" (Peirce 1998, 394). According to Peirce, all signs are part of a connected web: an element of one sign (e.g., the interpretant) is able to become a different element in a new sign (e.g., the object), or the whole triadic relation of one sign might become a single element in another (de Waal 2001, 71). Thus Peirce's semiotic triads are not to be thought of as static structures but as moments in the dynamic flux of *semiosis*, a continuous process of semiotic growth (Peirce 1998, 411).

Peirce is known as the founder of the philosophical school of pragmatism, and because of the direction that this school subsequently took it is often assumed that Peirce was an epistemological anti-realist. He in fact sought to distance himself from this tendency in his followers. He announced in *What Pragmatism Is* that "the writer, finding his bantling 'pragmatism' so promoted, feels that it is time to kiss his child good-bye and relinquish it to its higher destiny; while to serve the precise purpose of expressing the original definition, he begs to announce the birth of the word 'pragmaticism,' which is ugly enough to be safe from kidnappers" (Peirce 1998, 334–35). One way of understanding how Peirce's semiotics is consistent with epistemological realism is to note that the triadic structure of the sign permits contact with real objects in the world. In contrast, the Saussurian tradition leaves signs floating unconstrained in the mind of the sign user. Furthermore, Peircean semiosis does not take place within isolated minds but is a social activity undertaken by the community of inquirers, participants in the web of semiosis, whose collective opinion would, given sufficient time, ultimately converge on the truth (Peirce 1992, 139).

Peirce's pragmaticism is not merely a theory of *human* knowledge but places human knowing within the context of a "struggle" of inquiry (Peirce

1992,114–15) that characterizes the whole of the evolutionary process. All reasoning, at whatever stage of evolutionary history, takes place by means of signs. Therefore Peirce's account amounts to an affirmation of a continuity in nature based on the processes of semiosis. Peirce regarded this as a manifestation of an important general phenomenon of continuity in nature, which he referred to by the term *synechism* (e.g., Peirce 1998, 335). He regarded his epistemology as building on the "common-sensism" of eighteenth-century Scottish philosophers such as Thomas Reid (1710–1796) and James Beattie (1735–1803) (Peirce 1998, 347), according to whom morality and reasoning are grounded in species-wide innate forms of knowledge (Corrington 1993, 53–54).

The Categories. Peirce's semiotics rests on his system of three fundamental categories (Peirce 1998, 272–73), which he called Firstness, Secondness, and Third-ness. He claimed to be able to derive these categories by two independent methods, one deductive and the other phenomenological. He summarized the categories as follows: "The First is that whose being is simply in itself, not referring to anything nor lying behind anything. The Second is that which is what it is by force of something to which it is second. The Third is that which is what it is owing to things between which it mediates and which it brings into relation to each other" (Peirce 1992, 248).

Expanding on the category of Firstness, Peirce emphasized that, by virtue of the fact that its nature is to be independent in origin from relation or reference to anything else, it can never be adequately grasped or described:

> The idea of the absolutely First must be entirely separated from all conception of or reference to anything else; for what involves a second is itself a second to that second. The First must therefore be present and immediate, so as not to be second to a representation. It must be fresh and new, for if old it is second to its former state. It must be initiative, original, spontaneous, and free; otherwise it is second to a determining cause. It is also something vivid and conscious; so only it avoids being the object of some sensation. It precedes all synthesis and all differentiation: it has no unity and no parts. It cannot be articulately thought: assert it, and it has already lost its characteristic of innocence; for assertion always implies a denial of something else. Stop to think of it, and it has flown! (Peirce 1992, 248)

Once we conceive of any phenomenon that manifests something of the nature of otherness or difference we meet the category of Secondness:

> The Second is precisely that which cannot be without the first. It meets us in such facts as Another, Relation, Compulsion, Effect, Dependence, Independence, Negation, Occurrence, Reality, Result. A thing cannot be other, negative, or independent, without a first to or of which it shall be other, negative, or independent. . . . We find secondness in occurrence, because an occurrence is something whose existence consists in our knocking up against it. . . . The idea of second must be reckoned an easy one to comprehend. That of first is so tender that you cannot touch it without spoiling it; but that of second is eminently hard and tan-

gible. It is very familiar too; it is forced upon us daily: it is the main lesson of life. (Peirce 1992, 248–49)

Finally, Thirdness is the category required to introduce the possibility of mediation, which cannot arise from Firstness and Secondness alone:

First and Second, Agent and Patient, Yes and No, are categories which enable us roughly to describe the facts of experience, and they satisfy the mind for a very long time. But at last they are found inadequate, and the Third is the conception which is then called for. The Third is that which bridges over the chasm between absolute first and last, and brings them into relationship. (Peirce 1992, 249)

Whereas the category of Firstness is characterized by an "airy-nothingness" and Secondness by the "Brute Actuality of things and facts," Thirdness "comprises everything whose being consists in active power to establish connections between different objects" (Peirce 1998, 435). As such, Thirdness is the source of meaning and intelligibility in the universe (Corrington 1993, 135).

Peirce intended his categories to be comprehensive—sufficient to encompass all possible phenomena without further expansion (Peirce 1992, 251). Furthermore, he believed the categories to be irreducible to one another or to any other category (1992, 251–52). Of particular importance to the model of the Trinity proposed here is his conviction that the presence of one of the categories always implies the presence of the others. Although the categories can be abstracted—*prescinded*, as Peirce called it (1992, 2–3)—from experience, no experience can in fact avoid being composed of all three categories. As Peirce put it: "Not only does Thirdness suppose and involve the ideas of Secondness and Firstness, but never will it be possible to find any Secondness or Firstness in the phenomenon that is not accompanied by Thirdness" (Peirce 1998, 177). He notes the similarity of this position to that of Hegel. However, according to Peirce, Hegel's "absolute idealism" gives priority to Thirdness (i.e., rationality or mind), over the categories of Firstness and Secondness. In contrast, Peirce wished to uphold the genuineness of Firstness and Secondness in their own right:

Let the Universe be an evolution of Pure Reason if you will. Yet if while you are walking in the street reflecting upon how everything is the pure distillate of Reason, a man carrying a heavy pole suddenly pokes you in the small of the back, you may think there is something in the Universe that Pure Reason fails to account for; and when you look at the colour *red* and ask yourself how Pure Reason could make *red* to have that utterly inexpressible and irrational positive quality it has, you will perhaps be disposed to think that Quality [Firstness] and Reaction [Secondness] have their independent standings in the Universe. (Peirce 1998, 177–78)

Evolutionary Cosmology. Peirce developed his system of categories into a highly original evolutionary cosmology. He proposed that there are three possible modes of evolutionary change. The first is evolution by chance ("tychastic" evolution). Peirce regarded this as the basis of Darwin's theory: "Natural selection, as conceived by Darwin, is a mode of evolution

in which the only positive agent of change in the whole passage from moner to man is fortuitous variation" (1992, 358). Evolution by chance would be a manifestation of the category of Firstness, because Firstness is the category whose characteristic is a lack of constraint or determination by other events or entities. Peirce found Darwin's scheme ultimately unsatisfactory:

> The vast majority of our contemporary naturalists hold the opinion that the true cause of those exquisite and marvellous adaptations of nature for which, when I was a boy, men used to extol the divine wisdom, is that creatures are so crowded together that those of them that happen to have the slightest advantage force those less pushing into situations unfavourable to multiplication or even kill them before they reach the age of reproduction. . . . As Darwin puts it on his title-page, it is the struggle for existence; and he should have added for his motto: Every individual for himself, and the Devil take the hindmost! Jesus, in his Sermon on the Mount, expressed a different opinion. (1992, 357)

The second possible mode of evolution is that which is constrained by necessity ("anancastic" evolution). Evolution by necessity would be a manifestation of the category of Secondness, the category of constraint and determination by something other. Many current discussions argue that the process of evolution reflects a balance of chance and necessity (e.g., Bartholomew 1984; Ward 1996); in Peircean terms, a balance between Firstness and Secondness. Peirce rejected the idea that such a balance offers an adequate explanation of the world as we know it (Peirce 1992, 331), holding instead that beyond the categories of chance and necessity (Firstness and Secondness) a complete explanation of evolution requires the category of Thirdness. Thirdness is a prerequisite for semiosis, and therefore, according to the perspective of biosemiotics, for life.

Peirce also regarded Thirdness as the category that gives to the universe "a vital freedom which is the breath of the spirit of love" (1992, 363). For this reason he referred to the third mode of evolution as "agapastic" evolution: "Everybody can see that the statement of St. John [that 'God is love,' 1 John 4:8] is the formula of an evolutionary philosophy, which teaches that growth only comes from love. . . . The philosophy we draw from John's gospel is that this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution" (1992, 354).

Peirce speculated, in language which we might note in passing is suggestive of current notions of cosmogenesis from quantum fluctuations, that the order (Secondness) and intelligibility (Thirdness) of the universe evolved from a primordial condition of indeterminate chaos (Firstness):

> In the beginning,—infinitely remote,—there was a chaos of unpersonalised feeling, which being without connection or regularity would properly be without existence. This feeling, sporting here and there in pure arbitrariness, would have started the germ of a generalising tendency. . . . Thus, the tendency to habit would be started; and from this with the other principles of evolution all the regularities of the universe would be evolved. (1992, 297)

In summary, Peirce proposed a triadic theory of semiotics, underpinned by a threefold system of metaphysical categories. According to Peirce the categories, which form the basis of his evolutionary cosmology, are comprehensive, irreducible, and mutually implicative of one another. These characteristics, as I explore further in the following section, have strong similarities to the conceptual requirements of the Christian doctrine of the Trinity.

A Semiotic Model of the Trinity

I now draw on Peirce's semiotics and categories to develop a semiotic model of the Trinity. I suggest that scriptural and traditional accounts of the characteristics of the Father, Son, and Holy Spirit have significant parallels with the characteristics of Peirce's categories of Firstness, Secondness, and Thirdness respectively. I propose that the dynamic and irreducibly triadic process of semiosis offers a model of the mutual indwelling (*perichoresis*) of the trinitarian persons, a model that is able to address and clarify several ongoing issues in trinitarian theology.

The Son/Word and Secondness. "In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through him, and without him not one thing came into being" (John 1:1–3 NRSV).

These words from the prologue of the Fourth Gospel provide the obvious starting point for developing a semiotic model of the Trinity. John's prologue draws on the Hebrew notion of the Word (*dabar*) which, alongside those of Wisdom and Spirit, functioned in Hebrew thought as a personification of God's creative and redemptive activity. Thus the New Testament's most explicit statement of the concept of incarnation, culminating in verse 14, "the Word became flesh," is made using a semiotic metaphor. In the Johannine formulation the fact that the Word is *with* God implies that the Word is also in some sense distinct from God (the Father). Thus the Word is a manifestation of otherness, the cardinal feature of Peircean Secondness. This otherness, however, allows the Word to stand for, or represent, something else. John makes it clear that what the Son/Word represents is God (the Father), who would otherwise be unknowable, a theme that is repeated throughout his Gospel (cf. 2 Corinthians 4:4; Philippians 2:6; Colossians 1:15; Hebrews 1:3).

The metaphor of the uttered Word, which is both one with and yet distinct from its speaker, was to prove rich with trinitarian possibilities (O'Collins 1999, 79). When clear formulations of the relationship between the Father and Son came to be articulated in the second century, the Christian apologists who achieved this did so by employing the concept of the Word (Kelly [1958] 1977, 104). In doing so they were able to make contact with Greek thought in the form of the Stoic concept of the Logos,

the dynamic reason or plan that gives form to matter. In particular, the apologists adopted the Stoic distinction between the *logos endiathetos* (internal rational thought) and the *logos prophorikos* (the expression of that thought). Thus, for example, Justin Martyr (c. 100–165) expressed the relation between the Father and Son in terms of the following semiotic analogy: "When we utter a word, it can be said that we beget the word, but not by cutting it off, in the sense that our power of uttering words would thereby be diminished" (Justin 1948, ch. 61, *Dialogue with Trypho*).

In spite of the richness of the metaphor of the Word, the expressions of trinitarian belief formulated at the Councils of Nicaea (325) and Constantinople (381) did not draw on the concept of the Logos. The reason for this appears to have been the apparent subordinationist implications of Logos Christologies. Until Nicaea a form of subordinationism was in fact the orthodox position, a position which could be considered to be grounded in the scriptural witness to the economy of salvation: the Son who is sent is inferior to the Father who sends (LaCugna 1991, 29–30). Likewise, the Word who is uttered would naturally have been held to be inferior to the Father who utters. It was the Arian crisis that made it necessary for theologians to articulate how the apparent subordinationism implicit in the economy of salvation does not imply subordinationism at the ontological level of the intra-trinitarian relations. In these circumstances it is perhaps not surprising that in the Nicene Creed the apparently subordinationist Logos Christology was quietly dropped.

After Nicaea, "Logos" was generally replaced by "Son" as the standard title for Jesus in Christian thought (Dunn 1989, 214). It appears, then, that John's bold Logos Christology, which had been so fruitfully developed by the early apologists, had not lived up to its original promise when it came to formulating the statements of trinitarian and christological orthodoxy in the fourth and fifth centuries. The semiotic model of the Trinity that I propose here may be regarded as an attempt to reaffirm the appropriateness and fruitfulness of the Logos concept.

The Father and Firstness. The fourth-century creeds that became the expression of trinitarian orthodoxy were formulated in response to Arianism. Arius had argued that the Son is begotten (generated) from the Father, and that to be begotten is the same as to be created. According to Arianism it therefore followed that the Son must be a creature. The creed that arose from the Council of Nicaea rejected this argument, asserting that the Son is *homoousios* (of one substance) with the Father. After Nicaea a reaction occurred in favor of Arianism. At the Council of Constantinople a compromise term, *homoiousios* (of like substance), was rejected and the Nicene formulation was confirmed.

One of the theological developments that facilitated the eventual acceptance of the *homoousios* formula was Athanasius' clarification of two terms

that had hitherto been considered interchangeable. The challenge posed by Arius may be regarded as having depended on an ambiguity in the terminology used to describe the transcendent character of the Father. Specifically, at the time of the crisis leading up to the Council of Nicaea no clear distinction was generally made between the terms *agenetos* (from *ginomai*, I come into being) and *agennetos* (from *gennao*, I beget). It was agreed by all parties that the Father was *agennetos* (unbegotten). However, at the time there was no difficulty in contrasting this with a description of the Son as *genetos* rather than *gennetos*, since a clear distinction between these two terms had not yet been made (Prestige [1936] 1952, 151). The Arians seized upon the term *genetos*, claiming that it implied something that was made or created, unlike the uncreated nature of the Father. It was Athanasius who resolved this ambiguity in the terminology by distinguishing explicitly between *agennetos* (unbegotten) and *agenetos* (uncreated) (Prestige 1933, 264–65). This made it possible to say of the Son that he is begotten (*gennetos*) but uncreated (*agenetos*).

Athanasius' assertion of the difference between *agenetos* and *agennetos* has a parallel in the semiotic model. To say that a phenomenon manifests Peircean Firstness is, I suggest, equivalent to saying that the phenomenon is *agennetos*. In other words, Firstness is the category of unbegottenness, the quality of not being defined in relation to something else. This is not the same as saying that the phenomenon is something uncreated (*agenetos*). Likewise, the category of Secondness describes a phenomenon which is *gennetos* (begotten; whose being is defined by being different from or opposed to something). By describing phenomena within the created order in terms of the categories of Firstness and Secondness, the semiotic model is thus able to illustrate the difference between *gennetos* and *agennetos* in a way that does not confuse either of these with the question of whether something is created or uncreated (*genetos* or *agenetos*). In short, the semiotic model is able to affirm (contra Arianism) the coherence of holding that the Son is begotten but not created.

The semiotic model is not merely able to clarify the concept of the ingenerateness of the Father; it also is able to offer some constructive ways forward in thinking about the First Person of the Trinity. First, Peirce's categories do not rest on a substance metaphysics (Hausman 1993, 107–8). Unhelpful connotations of the word *substance* (such as immutability) in relation to the persons of the Trinity are thereby avoided. Similarly, Peirce's category of Firstness does not imply simplicity or straightforward unity. The semiotic model is therefore able to provide a response to Eunomius's version of Arianism, according to which the nature of the Father can be fully understood by reference to a definition (as opposed to a description) of the Father as ingenerate (LaCugna 1991, 55–66). According to the semiotic model, in contrast, the Father is characterized by the ungraspable, incomprehensible richness of the qualities of Firstness.

Second, an uncritical approach to male trinitarian terminology can lead to a hierarchical and patriarchal view of the Trinity in which the Father is seen as the authoritarian head of the trinitarian household (Johnson 1992). In contrast, the semiotic model portrays the First Person of the Trinity in terms of a rich collection of concepts, many of which are perhaps more usually thought of as feminine attributes—beauty and spontaneity, for example. I do not wish to imply that the Father is in fact characterized by female rather than male qualities or that these qualities are properly thought of as being exclusively feminine; my point is that by identifying Peircean Firstness with the Father the semiotic model undermines a simplistic patriarchal interpretation of trinitarian language.

The Spirit and Thirdness. In the semiotic model I suggest that the Holy Spirit may be understood as manifesting the characteristics of Peirce's category of Thirdness. According to the traditional Christian reading of Genesis 1:2 it is the Spirit (*ruach*) who sweeps over the formless void, with the promise of bringing order (Thirdness) to the primordial chaos (Firstness). In the Old Testament the Spirit, like Thirdness, is described as the source of all life (Psalm 104:29–30; Ezekiel 37:1–10), both human (Genesis 2:7; Job 33:4) and nonhuman (Genesis 6:17, 7:15; Job 34:14–15; Psalm 104:25). In the New Testament the emphasis shifts to the role of the Spirit as the source of the *new* creation, the new life heralded by the resurrection (e.g., Romans 8:11). In the light of this biblical background it is legitimate to identify one of the distinctive characteristics of the Spirit, like that of Thirdness, as that of bringing the life-giving power of God to creatures.

In addition to the similarities between the Spirit and Thirdness as the source of life there are parallels in the roles that each may be understood to play in relation to history. The Spirit may be regarded as the source of openness to the future (Pannenberg 1994, 97–98), which coheres with Peirce's notion that Thirdness is the category on which genuine freedom depends. Another aspect of this parallel is that in Peirce's *agapasticism* this openness to the future is closely connected with the nature of love. Likewise, in trinitarian theology there is a strong tradition of understanding the Spirit in terms of love, notably in Augustine's identification of the Spirit as the bond of love between the Father and Son (Augustine 1991, *De Trinitate* XV.43). A further parallel with the category of Thirdness is that the Spirit may be regarded as the source of knowledge and reason. The Spirit inspires the prophets (e.g., Isaiah 61:1) and is the source of insight and understanding (e.g., Isaiah 11:2) and of interpretation (1 Corinthians 12:10). In this respect the semiotic model is consistent with an early strand of Christian thought, found in the writings of Theophilus of Antioch (died c. 185) and Irenaeus of Lyons (c. 130–200), which identified the Spirit, rather than the Word, with the Hebrew personification of Wisdom (Kelly [1958] 1977, 102–6).

In 1 Corinthians 12 Paul appears to write of the gifts of the Spirit as particular to humans, as opposed to manifesting a creative power which is active throughout the cosmos (e.g., Joel 2:28–29). Thus there appear to be two divergent traditions concerning the Spirit: on the one hand, the cosmic creative action of the Spirit; on the other, the special gift to humans of knowledge and understanding (Deane-Drummond 2000, 116–21). The semiotic model offers a way of reconciling these traditions. From a Peircean perspective the source of life and the basis of knowledge and understanding are both to be found in the category of Thirdness. For this reason the semiotic model makes sense of the affirmation in the Niceno-Constantinopolitan Creed that the Holy Spirit is both "the Lord, the giver of life" and "has spoken through the prophets." Furthermore, Peirce's notion of Thirdness as the source of intelligibility, together with his emphasis on the communal nature of knowledge (Peirce 1992, 149–50), ties closely with the Spirit's paradigmatic inauguration of the church, expressed as it is by Luke in terms of otherwise incomprehensible languages becoming intelligible (Acts 2). The semiotic model would thus support attempts, such as that of John Zizioulas (1991), to reaffirm the role of the Spirit in "constituting" the church.

These considerations demonstrate that there are significant parallels between the characteristics of the Spirit and those of Peirce's category of Thirdness. A further question is whether the reason for these parallels can be traced to a single defining feature shared by both the Spirit and Peircean Thirdness. In other words, is it justifiable to claim that, like Thirdness, the identifying characteristic of the Spirit is the function of mediation? I suggest that the answer to this is that neither scripture nor tradition has clearly and consistently made such an identification, at least not to the same extent that, as discussed above, the Father may be identified with ingenerateness (Firstness) and the Son with distinction and begottenness (Secondness). Indeed, the absence of a clear notion of the distinguishing features of the Spirit may lie at the root of the difficulty that the theological tradition has had in expressing the place of the Spirit in the Trinity and the consequent tendency for the Spirit to be relatively neglected in theology and worship.

Nevertheless, some support can be found for an identification of the Spirit with the phenomenon of mediation. In John's Gospel, Jesus promises that the Father will give the disciples the Spirit as an "advocate" (John 14:16) who will act as what amounts to a mediator between Christ and the world (John 16:13–15). In fact, in pre-Christian and non-Christian Greek literature the word *paraclete*, usually translated as "advocate" or "helper," can also mean "mediator" (Arndt and Gingrich 1952, 623). Paul uses the language of mediation when he declares that "God's love has been poured into our hearts through the Holy Spirit" (Romans 5:5) and that the Spirit "intercedes" for the saints (Romans 8:26). Augustine suggested

that "the Holy Spirit is a kind of inexpressible communion or fellowship of Father and Son" (Augustine 1991, *De Trinitate* V.12). The idea that the primary characteristic of the Spirit is the phenomenon of mediation is summed up by John V. Taylor when he calls the Spirit "the Go-Between God" (Taylor 1972, 22).

Semiosis as Perichoresis. How does the semiotic model contribute to understanding the relationships between the trinitarian persons and the related problem of the basis of the unity of God? Trinitarian theology has produced two main approaches to the latter question. In the West, the divine unity has tended to be understood in terms of an underlying substance (*ousia*). This approach is sometimes suspected of leading, in contrast to the biblical view, to a philosophically based conception of God as an impersonal, necessarily existent being (Zizioulas 1991, 24–25). Furthermore, the idea that the unity of the trinitarian persons rests on an underlying substance leads toward modalism, because the persons then appear to be mere modes of manifestation of that substance. These problems are avoided by what has traditionally been the Eastern approach, which is to see the unity of God as derived from the person of the Father, who is held to be the sole origin of the Son and Spirit (Kelly [1958] 1977, 265).

The semiotic model has affinities with this Eastern approach to God's unity but has the advantage of offering a response to the common suspicion that the Eastern view leads to subordinationism. In Peirce's cosmology, Firstness is prior to Secondness and Thirdness in the sense that the latter two depend logically on the existence of the former. However, Secondness and Thirdness are not subordinate to Firstness. The semiotic triad is irreducible: none of the three elements would constitute a sign in the absence of the other two. Indeed, Peirce held that Firstness must necessarily generate Secondness, and the two together unavoidably give rise to Thirdness (de Waal 2001, 11).

The most important safeguard against subordinationism in the semiotic model, however, is the fact that Peirce's semiotic triad is not a static entity but an abstraction from the dynamic web of semiosis. An element of one sign can become a different element in a new sign, or the whole threefold relation constituting one sign can become a single element in another. Therefore the three categories do not correspond to a fixed triangle with Firstness at the apex; rather, they are the threefold ground of the dynamic process of semiotic growth. This aspect of the semiotic model corresponds, I suggest, to the concept of the perichoresis of the trinitarian persons.

The term *perichoresis* means mutual indwelling and dependence: "being-in-one-another, permeation without confusion" (LaCugna 1991, 271). The term was initially used by the Cappadocian Fathers to describe the relationship between the two natures of Christ but was subsequently found

to have a more useful role in trinitarian theology, expressing the dynamic unity of the persons without grounding this unity in either an underlying substance or in the person of the Father. Two Latin translations of perichoresis emerged: *circumincessio* (from *circum-incedere*, to move around), and *circuminsessio* (from *circum-in-sedere*, to sit around). The former of these captures better the dynamic aspect of the concept and is suggestive of one analogy which is often referred to, that of perichoresis as a dance (though the Greek for "dance around," *perichoreuo*, is etymologically unrelated). My suggestion, then, is that the dynamic, mutually dependent, and creative interplay of the categories that underlies the triadic process of semiosis is a model of the "being-in-one-another," the perichoresis, of the trinitarian persons.

The semiotic model thus offers a new way of thinking about the Trinity which avoids the hazards of either subordinationism or modalism. What of the further requirement of any satisfactory model of the Trinity, that the model be capable of accounting for the limitation of the number of persons to three? The short answer to this is that Peirce's system of categories is intended to show that three, and only three, categories are sufficient to encompass all phenomena. A more subtle implication of the semiotic model concerns the very possibility of counting the number of trinitarian persons. As the Cappadocian Fathers pointed out, there is a sense in which the category of number is altogether inapplicable to the Godhead. Basil of Caesarea, for example, argued that numerical concepts may only be applied to God "reverently" and claimed that, although each of the persons is spoken of as "one," this does not imply that they can be taken as numerically equivalent in the sense that they may be simply added together (Kelly [1958] 1977, 268). Likewise, in the semiotic model, although we may speak of three categories, the very notion of a threefold distinction of categories draws on the category of Secondness, without which the difference (otherness) of the categories from one another would not be recognized.

The fundamental issue at stake here is the nature of the trinitarian persons and their relations. Whereas the meanings of the words *hypostasis* or *person* have usually been recognized to be somewhat problematic (Augustine 1991, *De Trinitate* V.10; Rahner [1967] 1999, 42–45), the term *relation* is normally used as if its meaning is easily understood and requires no discussion. This amounts, I suggest, to loose talk about the nature of relations. Peirce's scheme of categories allows for not just one but three types of relation. Firstness is what we might call a zero-order relation, an absence of derivation from relation to anything else. Secondness is the relation of distinction or otherness. Thirdness is the relation of mediation. We glimpse here a radical implication of the semiotic model: namely, that in discussing the relationship between the unity and distinction of the persons of the Trinity, theology has become tied (as the very language of "unity" and "distinction" exposes) to a limited view of the nature of relations. The currently

fashionable idea of a trinitarian unity based on the concept of relationship risks elevating *relation* to the status of an underlying substance beyond the Trinity (cf. Harris 1998, 224–25). Our talk of trinitarian relations must therefore acknowledge that the very possibility of relationship arises from *within* the Trinity and not from outside it. This is precisely what the semiotic model offers. The three persons are distinct, and the possibility of this distinctness is derived from the distinction (Second-ness) of the Son from the Father. The three persons are also related to each other by the relationship of mediation, and the possibility of such mediation (Thirdness) is grounded in the person of the Spirit. The free and irreducibly triadic interplay of Firstness, Secondness, and Thirdness that constitutes the process of semiosis thus offers a model, in my proposal, for the perichoretic unity of the Trinity.

The Trinity and Creation

Irenaeus of Lyons has been credited with developing "the first thoroughgoing and expansive Christian doctrine of creation" (Gunton 1998, 52). At the heart of Irenaeus's vision lay an emphasis on the role of all three persons of the Trinity in God's creative activity:

> It was not angels, therefore, who made us, nor who formed us, neither had angels power to make an image of God, nor any one else, except the Word of the Lord, nor any Power remotely distant from the Father of all things. For God did not stand in need of these [beings], in order [that] the accomplishing of what He had Himself determined with Himself beforehand should be done, as if he did not possess His own hands. For with Him were always present the Word and Wisdom, the Son and the Spirit, by whom and in whom, freely and spontaneously, He made all things. (Irenaeus 1867, *Adversus Haereses* 4.20.1; cf. John 1:1–3, 1 Corinthians 8:6, Colossians 1:15–17, Hebrews 1:1–3)

This passage from Irenaeus neatly summarizes the central features of his trinitarian doctrine of creation (Gunton 1998, 41–64). To begin with, Irenaeus's assertion that God creates through the mediation of the Son and Spirit points to the closely connected doctrine of creation out of nothing (*ex nihilo*). If creation is brought about by the mediation of God's own self, there is no need to suppose that it takes place from some other coeternal reality alongside God. Furthermore, the idea of the creative mediation of the Son and Spirit dispenses with the need to suppose, as neo-Platonism did, that creation takes place through a hierarchy of intermediaries between God and the world. If creation is neither the work of an inferior demiurge nor a necessary neo-Platonic emanation from God, it is possible to affirm, contrary to Gnosticism and neo-Platonism, the goodness of the whole created order.

In the passage cited above Irenaeus refers to the mediation of creation by the Son and Spirit in terms of the actions of the two "hands" of God. This points to a weakness in Irenaeus's doctrine—one that tends to be

repeated in current trinitarian theology—in that his failure to give a clear account of distinctive roles for the Son and Spirit leaves it unclear why both should be regarded as playing a necessary role in creation. The semiotic model offers to remedy this weakness by bringing to light the distinctive work of each trinitarian person. As argued above, in the semiotic model the Son/Word may be regarded as possessing the characteristics of Peirce's category of Secondness. In the light of the semiotic model I therefore suggest that the role of the Son in creation may be understood as that of providing the ground of the *distinction* between God and the created order. A similar idea, which can be traced back to Hegel, has recently been developed by Wolfhart Pannenberg, according to whom "In the Son is the origin of all that differs from the Father, and therefore of the creatures' independence vis-à-vis the Father" (Pannenberg 1994, 22). This absolute otherness (Secondness) of the creator from the created is central to the Christian doctrine of creation *ex nihilo* (May 1994, 161). Extending this idea of the Son as the source of Secondness, the Son may be also regarded as the origin of every distinction *within* the created order (cf. Pannenberg 1994, 28).

Likewise, as suggested above, the scriptural and traditional understanding of the Spirit has significant parallels with Peirce's category of Thirdness. I suggest that the role of the Spirit in creation may therefore be regarded as that of mediating between God and the world, bringing into relationship that which would otherwise be separated by the otherness of Secondness. This coheres with the scriptural witness, according to which God enters the world in the Incarnation through the mediation of the Spirit (Matthew 1:20; Luke 1:35) and the reconciliation of the world to God is regarded as a function of the Spirit (e.g., Romans 8:1–27). Just as the Son may be understood as the ground of the distinction between God and creation and as the source of all distinctions (Secondness) within creation, so the Spirit may be understood as the ground of mediation between God and creation and as the source of all mediation (Thirdness) within creation.

If, as I am proposing, the trinitarian being of God may thus be understood as the source of the categories of Firstness, Secondness, and Thirdness in the world, then we may say that the presence of these categories, including their manifestation in natural processes of semiosis, is—to use a concept introduced by Augustine—*a vestige of the Trinity in creation* (Augustine 1991, *De Trinitate* VI.12).

What is gained theologically by understanding Peirce's categories and semiotics as vestiges of the Trinity in creation? The answer, I suggest, is that the claim that particular aspects of nature are vestiges of the Trinity implies an intrinsic connection between those phenomena and the being of God. Karl Rahner's well-known axiom that "the 'economic' Trinity is the 'immanent' Trinity and the 'immanent' Trinity is the 'economic' Trinity" is an attempt to affirm this intrinsic relationship between the created

order and the triune creator (Rahner [1967] 1999, 22). The tendency to disconnect the immanent Trinity from the economic Trinity is reflected in the idea that the creative work of the Father, Son, and Spirit cannot be distinguished but that different roles can be "appropriated" to each of them. When theology comes to see in God's relation to the world "only the appropriated relations of the divine persons," Rahner argues, then we "have nothing to do with the mystery of the Holy Trinity except that we know something 'about it' through revelation" ([1967] 1999, 14). No wonder that, as Rahner puts it, "We must be willing to admit that, should the doctrine of the Trinity have to be dropped as false, the major part of religious literature could well remain virtually unchanged" (p. 11).

According to Rahner, a symptom of the isolation of the doctrine of the Trinity from the rest of Christian theology, including the doctrine of creation, has been a reluctance to consider the possibility that the world may exhibit vestiges of the triune creator (pp. 13–14). The semiotic model offers a new way of developing this neglected theological concept and thereby of constructively addressing perhaps the most pressing problem for trinitarian theology today—that of reconnecting immanent and economic trinitarian thought (cf. LaCugna 1991).

A New Theology of Nature

At the beginning of this essay I identified three issues that evolutionary theory raises for theology: continuity, contingency, and naturalism. How does the semiotic model help to articulate a theological response to these apparent challenges?

Continuity. The theological problem posed by the phenomenon of evolutionary continuity is twofold. First, a theology of nature must provide an adequate account of how humans are related to, and what we have in common with, the rest of the natural world. Second, theology must be able to give an account of what, if anything, is special about human existence. The danger is, on the one hand, of falsely separating humanity from the rest of creation and, on the other, of failing to recognize our genuine distinctiveness as a species. The theology of nature proposed here avoids these twin hazards by drawing on the idea that there is a *semiotic continuity* between all living things.

From the perspective provided by Peirce's semiotics the most fundamental biological processes are connected with, and provide the ground of, human semiotic capabilities. From its origin life is dependent on sign-processes. The feature common to the whole subsequent history of biological evolution is a general increase of "semiotic freedom" (Hoffmeyer 1996, 61; cf. Moltmann 1985, 198). The triadic semiotic relationship which permits, for example, the sequence of nucleotides to act as a biological "code" is part of the same web of semiosis as that in which human

religious signs (or "symbols") are able to provide the vehicle for our self-transcendence (Corrington 1997, 22). The "symbolic structure of revelation" (Dulles 1980) is thus placed within a cosmic perspective.

In short, according to the semiotic model the distinctive feature of humanity is our particular use of the general phenomenon of semiosis: we are *Homo symbolicus* (Deacon 1997, 340) or, perhaps better, *Homo semioticus*.

Contingency. The semiotic model offers a response to the issue of evolutionary contingency by suggesting a new threefold classification of types of contingency.

One of the most important scientific advances of the twentieth century was the recognition that some occurrences, such as quantum events, are causally indeterminate—that is, due to chance. Peirce was arguably the first physicist and philosopher to anticipate this twentieth-century rejection of determinism (Brent 1998, 6). I suggest that this first type of contingency, the type characterized by sheer chance, or ontological indeterminacy, is a manifestation of the category of Firstness. This is because Firstness is the category of absence of determination by anything else. This is not to suggest that chance events occur completely outside the constraints imposed by the regularities of nature; it is simply to acknowledge that some events are not the predictable outcome of a causal chain. Neither is it to imply that such events are uncreated. The presence of Firstness in nature, the analogue of the ingenerateness of the Father within the Trinity, is a *created* Firstness, as much dependent on the creator for its existence as any other phenomenon in nature.

The second type of contingency, I suggest, is that which corresponds to the theological idea that the world depends on God and the closely connected notion that the way that the world is depends on how God willed it to be. As Michael Foster argued in the 1930s, this theological voluntarism may be regarded as distinguishing the Christian doctrine of creation from Greek thought. If the world is the way that it is because God willed it to be so, as the Christian doctrine of creation holds, then the world might have been otherwise. On the other hand, if the world is an emanation from God, or otherwise necessarily connected with God's being, then no alternative configuration of the world, other than the one that we know, would be conceivable (Foster 1934, 464).

Foster suggested that the rise of modern science depended on the Christian concept of the contingency of creation (Foster 1936). If the world could have been other than it is, rationalist attempts to deduce how the world must be will inevitably fail. Only empirical investigation can reveal what sort of world God has chosen to create. It is notable that Foster attributed the divergence between Christian and Greek views of the contingency of creation to the development of the doctrine of the Trinity (Foster 1935, 445). Plato had described the relationship between God and the

world both in terms of that of a maker to something made and that of parent to offspring. The Christian insight, according to Foster, was to restrict the latter type of relationship to the intra-trinitarian relations. As Brooke and Cantor put it (1998, 20), "This left the natural world as a created artefact, the artistry of which could be elucidated and appreciated."

In the model that I propose here, the contingency of creation, in the theological sense discussed above, would likewise be understood in trinitarian terms. A distinctive feature of the semiotic model, however, is that the contingency of the world in relation to God would be regarded as a specific function of the Word, the Second Person of the Trinity. This is because in the semiotic model the Word/Son is understood in terms of Peirce's category of Secondness, the category of otherness, constraint, and necessity. In the semiotic model the basis of the world's distinction from God is the trinitarian distinction between the Father and the Son. God the Father creates by speaking the Word, and the Word is also the source of all distinctions and otherness within the created order. From a creature's point of view the Word is thus the source of everything in creation that is experienced as necessary or constraining. The world exists as it does (and not some other way) because it is created through the mediation of the Word. The necessity of the laws of nature, from a creaturely point of view, is a reflection of the contingency of creation in the theological sense.

The third type of contingency in the classification that I am proposing is that which corresponds to the category of Thirdness. This type of contingency is familiar as the form of openness normally described as "free will." A distinctive feature of the semiotic model is that some degree of decision making, in the form of a capacity for the interpretation of signs, is attributed to even the simplest living things. (Unlike process theology, however—cf. Whitehead [1929] 1978—my proposal does not imply that such freedom is also a characteristic of nonliving entities.) In the course of the growth of semiotic freedom during evolution, sign-using organisms interact with an environment that exhibits both order (Secondness) and unpredictability (Firstness). In doing so, such agents, and preeminently human beings, manifest a form of contingency (freedom) that, as in Peirce's evolutionary cosmology, goes beyond the possibilities offered by any mere balance of chance and necessity.

In summary, the semiotic model invites a threefold classification of types of evolutionary contingency: sheer indeterminacy (Firstness), theological voluntarism (Secondness), and the growth of semiotic freedom and free will (Thirdness). This may be regarded as a development of Peirce's evolutionary cosmology, according to which evolution depends on all three of the categories. What the semiotic model adds to Peirce's cosmology is a trinitarian interpretation, according to which these three types of contingency are each understood to be grounded in the corresponding person of the Trinity. Thus, evolutionary contingency need no longer be regarded as

an embarrassment to Christian theology but may be understood as a reflection (and vestige) of the freedom of the trinitarian life of God.

Naturalism. Finally, how may the semiotic model offer a theological response to the issue of ontological naturalism? Many theologians regard a commitment to naturalism as by definition incompatible with theism, while others are more sympathetic to an exploration of the idea that God does not act in the world by means of supernatural interventions (e.g., Drees 1996; Knight 2001). It is worth noting that my proposal for a semiotic model of the Trinity, as developed so far in this article, could still stand without a commitment to naturalism. I provide here a brief sketch of the direction in which the model could be developed as a way of engaging theologically with the implications of ontological naturalism.

In Christian theology the way in which God relates to creation is expressed in terms of the relationship between nature and grace. Since Augustine, the tendency in the West has been to regard the relationship between nature and grace in terms of a sharp dichotomy. According to Augustine, left to its own devices human nature does not have the freedom to choose good, this freedom having been lost at the fall. Humans can be saved from their necessarily sinful nature only by grace; with grace humans necessarily desire to do good and no longer have the capacity for sin (Gelpi 2001, 64). A consequence of Augustine's sharp dichotomy of nature and grace is therefore a denial of human freedom: Left to itself, human nature necessarily sins; once subject to grace, humans cannot but choose to do good.

The relevance of the concept of grace to the plausibility of the notion of divine causal interventions in the world is that the idea of such interventions rests on the assumption of just such a dichotomy—that there is something called nature which exists independently of the grace of God and that divine grace "acts" on this nature from the outside to produce an effect. In Scholastic terminology, God's *act* was called "uncreated grace," whereas the *effect* of grace on the human being was called "created grace" (Schwöbel 2000, 277). From the time of the Enlightenment the theological concept of nature became reframed in terms of the scientific notion of the order of things which obey natural laws. As a result, grace came to be understood in terms of God's freedom to act in a world otherwise governed by necessity (Moltmann 1981, 207–8). A consequence of this further development of the dichotomy between nature and grace was that "the traditional conception of human nature as always destined for God-given union with God fell apart" (Kerr 1997, 113). Once nature and grace were regarded as discontinuous with one another the way was open to conceive of grace as God's causal intervention in nature.

According to Rahner, it is an "anti-trinitarian timidity" that has "induced theologians to conceive the relation brought about by grace between man and the three divine persons as one based upon 'created grace,' a product

of God's efficient causality, merely 'appropriated' differently to the single persons." If God relates to the world by means of efficient causes, there does not appear to be any intrinsic connection between the trinitarian relations *ad intra* and the actions of the Trinity *ad extra*: "It [average theology] sees in divine grace only the appropriated relations of the divine persons to man, the effect of an efficient causality of the one God. In final analysis, all these statements say explicitly in cold print that we ourselves have nothing to do with the mystery of the Holy Trinity except to know something 'about it' through revelation" (Rahner ([1967] 1999, 13–14).

The Eastern theological tradition has tended to take a different view of the relationship between nature and grace. According to the Orthodox approach, the relationship between nature and grace is understood not in terms of sanctification, as in the West, but in terms of participation (*theosis*) in the divine nature (cf. 2 Peter 1:4). The Eastern approach calls into question any sharp dichotomy of nature and grace and at the same time rejects the characterization of grace in terms of efficient causes. As Vladimir Lossky puts it, "The Eastern tradition knows nothing of 'pure nature' to which grace is added as a supernatural gift. For it, there is no natural or 'normal' state, since grace is implied in the act of creation itself. . . . 'Pure nature,' for Eastern theology, would thus be a philosophical fiction corresponding neither to the original state of creation . . . nor to the state of deification which belongs to the age to come" (Lossky [1944] 1957, 101).

The question arises, How is it possible for creatures to participate in the transcendent being of God? Gregory Palamas (1296–1359) offered an answer to this question that has subsequently become central to Orthodox thought on the relation between nature and grace. According to him, although the essence of God is unknowable, God's essence becomes accessible to creatures through the divine *energies*: "The difference [between the Eastern and Western traditions] consists in the fact that the western conception of grace implies the idea of causality, grace being represented as an effect of the divine Cause, exactly as in the act of creation; while for eastern theology there is a natural procession, the energies, shining forth eternally from the divine essence" (Lossky [1944] 1957, 88).

Although the Orthodox account is helpful in overcoming the notion of a strict dichotomy between nature and grace and therefore appears potentially more compatible with ontological naturalism than the Western approach, the concept of the divine energies gives rise to some difficulties. In the first place, it is not clear that the concept of the energies helps to explain the possibility of creaturely participation in God. According to Rowan Williams (1977, 44), Gregory's scheme "has hardened a somewhat *ad hoc* epistemological point [i.e., that God's essence is unknowable in itself] into an ontological differentiation really present in God." Second, the concept of the divine energies appears to undermine the relevance of the Trinity to the relationship between God and the world. For example, although Lossky

asserts that the concept of the energies is closely connected to the doctrine of the Trinity, the characteristics of the energies in fact correspond not to those of the Trinitarian persons but to the "innumerable" names of God, such as Wisdom, Love, and Power (Lossky [1944] 1957, 71, 80). The idea that the divine essence is separated from the created order by an intermediate level of being, the energies, distances the being of God from God's manifestation in the world. This is, as LaCugna puts it (1991, 194), bound to "break the back" of trinitarian theology. Gregory's assertion that every energy is common to the three divine persons is equivalent to the Western idea that the works of the persons *ad extra* are indistinguishable: the effect in both cases is to render the doctrine of the Trinity irrelevant (LaCugna 1991, 196–97).

What can the semiotic model of the Trinity add to the Eastern account? The answer, I suggest, is that the semiotic model offers an approach to the concept of *theosis*, which, unlike Gregory's notion of the divine energies, is able to connect the idea of participation in God with the doctrine of the Trinity. Specifically, in the semiotic model the idea of *theosis* may be envisaged as *creaturely participation in the semiotic life of God*. According to the semiotic model, the triune being of God is understood in terms of a semiotic *perichoresis* of the trinitarian persons. Creation may then be understood as mediated by the Word (the source of the otherness of creation from God, and of all distinctions within the created order) and the Spirit (the source of mediation between God and creation, and of all mediation within the created order). The created order is thus constituted in the image of the triune creator, the process of semiosis in nature being a vestige of the Trinity in creation. By the incarnation of the Word, through the mediation of the Spirit, God comes to participate in the semiotic life of the world. And through the new life that is the gift of the Spirit, manifested in the resurrection of Christ, creatures may participate in the semiotic life of God.

Conclusion

I offer, then, a semiotic model of the Trinity based on the philosophy of C. S. Peirce. The semiotic model may be summarized as follows: For God the Trinity—Father, Son, and Holy Spirit—semiosis is *perichoresis*; in creation, semiosis is the *vestigium trinitatis*; and for the creature, semiosis is *theosis*.

Although Peirce alluded to the possibility of a connection between his categories and the doctrine of the Trinity (Orange 1984, 21–22), he never attempted to develop his philosophy in a trinitarian direction (Raposa 1989, 167). Some Peirce scholars have noted similarities between Peirce's categories and the Trinity (Corrington 1993, 72; Smyth 1997, 70; Deledalle 2000, 173–80), but I am not aware of any fully developed Peircean model of the Trinity such as that outlined in this essay.

The argument presented here begins from a consideration of the theological challenges posed by evolutionary biology. The semiotic model of the Trinity that I develop in response to these challenges provides both a new way of thinking about the doctrine of the Trinity and a new approach to the theology of nature. Alfred North Whitehead famously described Christianity as "a religion in search of a metaphysic" (Whitehead [1926] 1960, 50). I propose the semiotic model as a new metaphysical framework within which to understand the relationship between God and creation, and the interface between science and theology.

NOTES

I gratefully acknowledge my debt to Dr. Christopher Southgate for his encouragement and guidance during the course of this research and thank Prof. John Dupré, Dr. Mark Wynn, Rev. Dr. Jeremy Law, and Prof. Roger Trigg for their helpful advice on the project at various stages of its development.

1. Peirce's writings are referred to in their currently most accessible form, the two volumes of *The Essential Peirce* (Peirce 1992; 1998).

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