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Complexity theory has much explanatory power in the scientific community today. The author finds that its bottom-up methodology and some of its concepts can facilitate new understandings of the Christian doctrine of the Trinity.

You can see a world in a grain of sand
And a heaven in a wildflower.
--William Blake,
"Auguries of Innocence"

The potential of consonant discourses

From the heavens full of galaxies down to the tiniest grains of sand, our world is full of amazing complexity. The enormous progress being made in our understanding of complex phenomena is considered by many scientists to be one of the most impressive features of contemporary science.1 Nowhere are these gains more evident than in complex systems theory. This research method analyzes the complex interaction in groups of agents that work together to form a cohesive unit, such as an ant colony or human society. How does complexity arise? How can complexity increase our understanding of God? What type of deity would be found in the heaven seen in Blake's wildflower?

Today, complex systems theory can shed significant light upon theology. This essay makes the following arguments: first, that there is a consonance between complex systems theory and theology; and second, that complex systems theory helps to illuminate the Christian concept of the Trinity.

Ernan McMullin uses the term "consonance" to refer to a harmony of sounds or elements between two bodies of knowledge, such as religion and science.2 Complexity is one such element that unites these two disciplines. Despite the fact that science and religion are different disciplines, with different tasks, categories, and objects of study, they complement each other in many ways. There is consonance between these two discourses that can deepen our understanding of God through a new linguistic synthesis that reflects the complexity of the natural world. To illustrate this consonance, language from complex systems theory can be appropriated to articulate clearly the Christian doctrine of the Trinity, the Divine reality of three Persons united in one essence.

Within the Latin Medieval tradition of analogy, complex systems theory can make a great contribution to the elucidation of the received Christian doctrine of the Trinity. Most of the recent work written on complexity and God has focused on God's activity in the world.3 As Athanasius pointed out in Against the Arians, God's acts (energeia) cannot be separated from God's being (ousia), although these two are distinct.4 Many of these authors have neglected to discuss how complexity can be employed in the constructive task of understanding and explaining both the acts and the being of God.

The synthetic articulation of the Trinity at the end of this essay seeks to highlight the complex interaction among the three Persons within the Godhead. This task is taken up with great reverence and trepidation, since the being of God is a mystery. Complex systems theory is applied to doctrinal construction—a human analytic/synthetic explanation of God that does not presume to make univocal claims concerning the mystery of God's essential essence.5 The Trinity displays complexity in three
primary ways: the double-dimensionality of being both in time and eternity, the establishment of identity through interaction, and the dynamic relations of the three Persons. This essay examines the complexity within the nature of the Trinity, after introducing the contemporary discourses in Trinitarian theology and complex systems theory.

**Introduction to complex systems theory**

Complexity is a multivalent term used in a wide variety of contemporary discourses. It is a subject so wide-ranging that nobody quite knows how to define it. In a recent article, William Stoeger clusters many topics under the rubric of complexity including dynamical systems, chaos, non-equilibrium thermodynamics and the physics of self-organization and of complex systems. The physics of complex systems refers to the quality of a group of interrelated entities that form a single whole. A complex system provides a forum where many distinct agents are interacting and interdepending on each other in a number of ways. The millions of chemically interacting proteins, lipids, and nucleic acids that make up the brain are an example of a complex system.

The ant colony is another popular model for illustrating a complex system, because while the individual ant can perform only one task at a time, all the ants in the colony can together perform over three dozen tasks concurrently; their aggregate behavior enables the colony to operate almost as a single organism. Scientists analyze such systems from the bottom up, observing the behavior and patterns of the individual ants, in order to understand the system as a whole. Systems are often adaptive, so scientists frequently find surprising “emergent behavior,” such as clusters of ants dividing labor to perform various tasks.

Contemporary complex systems theory has some of its roots in the general systems theory of the fifties. In his book, *Problems of Life*, Ludwig von Bertalanffy, the father of systems theory, marvels at the “tremendous architecture” of systems in the body from chemical structures to cells, tissues, organs, and multi-cellular organisms. These multi-level systems all hold together in living beings. Systems theorist Ervin Laszlo unifies these natural complex systems in his philosophy of nature as “integrated pluralism,” or “an ontology that proclaims both the diversity and unity of the world.” Thus, systems in nature are complex, yet unified and simple. This is the central paradoxical insight of complexity theory—unity within complexity.

Today, some of the most innovative work in complex systems theory is being conducted at the Santa Fe Institute. This research center has applied complex systems theory to a variety of disciplines, including computers, physics, anthropology, and biology. Mitchell Waldrop gives an account of the history of the Santa Fe Institute in his book, *Complexity: The Emerging Science at the Edge of Order and Chaos*, which contains one of the most comprehensive explanations of complexity theory to date. Waldrop argues that the structure, coherence and self-organizing cohesion of complex systems bring order and chaos into a special kind of balance. This balance is achieved at “the edge of chaos,” which Waldrop compares to the difference between solids, where the atoms are locked into place—and fluids, where the atoms tumble over one another at random. “The edge of chaos” is the transition stage between the extremes of order and chaos, where complexity is found: “a class of behaviors in which the components of the system never quite lock into place, yet never quite dissolve into turbulence either.”

**Recovery of trinitarian theology**

As the scientific community is coming to a new understanding of complexity, the Christian theological community is at the start of a new recovery of its central doctrine of the Trinity, which some would consider Christianity’s most complex concept. Under the tutelage of Augustine and Aquinas, the West has inherited a rich
tradition of Trinitarian theology. Yet, Western theology has not been without problems. The West has tended to emphasize the oneness of God, leading toward a psychological model of the Trinity quite different from the Eastern communitarian model. St. Augustine is often blamed for the Western emphasis on oneness at the expense of the three Persons.20 Karl Barth’s and Karl Rahner’s Trinitarian works build on this Augustinian foundation--where God is seen as the one self-conscious subject, in three “modes of being”19 and “distinct ways of subsisting.”20

This overemphasis on the unity of the Trinity was not found in the preceding strain of Christian theology in the East.21 Beginning with the three Persons of the Trinity, the concept of God held by Athanasius and the Cappadocian Fathers was decidedly more communitarian.22 To start with the three Persons of the Trinity in salvation history and then to move towards accounting for the nature of their unity, anticipates the bottom-up research approach of complexity theory. Many contemporary Eastern Orthodox theologians have employed this bottom-up methodology to preserve the communitarian tradition; they include John Zizioulas, who argues that the Trinity is being in communion.23 Community is central to the Christian understanding of God, since it posits Persons who are capable of fellowship. The contemporary recovery of the Trinity among Roman Catholics and Protestants also focuses on a relational and communal model.24

Some of these Christian theologians have begun to discuss God in light of contemporary science. Thomas Torrance has led the way in this integrative approach to Christian theology.25 More recently, during the summer of 1993, a cross-disciplinary group of twenty scholars and scientists met at the Center for Theology and the Natural Sciences in Berkeley, California.

Together they explored the implications of chaos and complexity theory for philosophical and theological understandings of God’s action in the world.26

One of the theologians in this group, Denis Edwards, wrote an important article, entitled "The Discovery of Chaos and the Retrieval of the Trinity," in which he argues that the universe is God’s self-expression, and that there are “proper” roles in creation for each Person of the Trinity.27 Edwards’ article is characteristic of most of the recent literature in religion and science today, with its concern for God’s activity in the world. Complex systems theory can also illuminate the Triune nature of God.

God’s nature in light of systems theory

If it is true that the God created the world, it would seem that God’s “invisible nature” would be mirrored in some ways in the creation, both in humanity, which bears the imago Dei, and in nature, which also bears the Divine imprint.28 Applying analogies from the natural world to the concept of God is a profitable way to deepen our understanding of God; however, there is no perfect analogy for God. The world is a

At the core of complexity is the conviction that complex systems share similar behavior; so, what is learned from one system can be applied to another.

to mirror of God, but God is not a mirror of the world. Furthermore, the world is an imperfect mirror of God, because of sin and the fall of humanity.

Analogies show similarity in difference. There is a fundamental difference between natural systems and the Christian God--namely the difference between created and uncreated, material and immaterial reality. As Thomas Aquinas said in the thirteenth century, “no term can be used of God in quite the same sense [univoce] as it is of other things.”29

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The Christian concept of a Trinity shows complexity in three primary ways: the double-dimensionality of being both in time and in eternity, the establishment of identity through interaction, and dynamic relations among the Persons.

Trinity are involved in the world from its creation to its consummation.

Even though the Son entered time, according to Christian theology, he was still one with the Godhead. Particularly illustrative are the statements of ontological unity in the Gospel of John. For example, Jesus said, "I and the Father are one." Through such statements, we see the intimacy and unity between the Father and Son, although they are distinct Persons and have different roles in redemptive history. The Father and Son are distinct, but not separate, because they are one communion, working together. Father and Son work together in different ways to redeem the world. The Father has the role of sender while the Son is sent into the world, to be crucified for the sins of humanity. The Father's and the Son's cooperative yet distinct roles in redemption make clear the personal interaction and interdependence of these two
distinct Persons, united with the Holy Spirit in one Godhead. The ants that work together in a colony, for their own self-preservation, model in a small way the Persons of the Trinity, who work together to redeem the world.

The presence and activity of the Holy Spirit in the Trinity intensifies the complexity within the Godhead. The Holy Spirit, traditionally referred to as the third Person, is also revealed and implied in the acts and interactions of the Father and Son. For example, the Holy Spirit plays many important roles in the life of Jesus—as the agent of the virgin birth of Jesus, the one who inspires his earthly life and the enabler of his works, death, and resurrection. As with the Father and the Son, the Holy Spirit’s Triune identity comes through mutual interaction and relations in the shared activities of the Godhead. The Spirit is the Spirit by virtue of its interaction with the Father and the Son. The relations are constitutive of each Person’s identity.

The Holy Spirit, as third Person of the Trinity, has an essential place in the Triune communion, because it is the presence of a third Person, regardless of which one, who ushers in the complexity. The three-body problem from astrophysics will illustrate this point. When two planets are in orbit, astronomers have no problem predicting their coordinates. However, when a third planet is added, the conditions become infinitely more complex. Because of the mutual perturbations of the three, there is no longer a closed solution for the equation. Although the parallel between the three planets and Persons of the Trinity is accidental, the fact remains that the Holy Spirit ushers an infinite amount of complexity into the Triune communion.

The Trinity displays complexity through the establishment of identity through interactions, and through the double-dimensionality of being in both time and eternity. This complexity reaches its zenith in the perichoretic relations between the three Persons. “Perichoresis” is the traditional term that describes this mutual containment, interpenetration and in-dwelling of the three Persons. Not only are there three Persons, displaying an infinite complexity, but these Persons wholly dwell within one another. This interpenetration is the height of complex interaction. The paradox is that, though each of the three distinct Persons mutually in-dwell, they are still three Persons united in one essence. While there is complexity in the Christian Trinity, God is also simple in very nature. Thus, the paradoxical insight of complexity theory—simplicity in complexity—is present in the Triune conception of God.

In order to redeem the world, the Son entered into time, displaying a complex, double-dimensionality within the Trinity, of being simultaneously in time and in eternity. Although Jesus was in time, he was not separated from the Father and the Spirit, because it is through their complex mutual interactions that their respective identities are found. The perichoretic relations among the three are the highest expression of the inner complexity present in the Trinity. Complexity is ordered into a beautiful unity in the concept of the Trinity. This appropriation of the language of complexity theory into the doctrinal construction of the Christian concept of God is only the beginning. Other religious perspectives should be incorporated into the modern discourse on complexity.

Clearly, a consonance may be found between complex systems theory and religion. As an example of how to work dialogically between these two disciplines, complex systems theory may be applied to concepts of God. The bottom-up methodology of complex systems theory is a further example of consonance between these fields and holds much promise for contemporary theological method.

The discourse of complexity theory is especially suited for clear theological articulation. Not only Christians, but theologians from all religious traditions, can use findings from complexity theory for a fresh articulation of their concepts of God. The complexity theorists can also benefit from dialogue with these faith traditions, to understand the deeper spiritual aspects of
complex natural phenomena. From a grain of sand on the beach to the little children building sand castles, complexity in our world points to the multitudes of galaxies in the heavens and beyond. Not only can we see a world in a grain of sand, but we can ascend to heaven in our viewing of a wildflower.

Works cited:


### Endnotes:

1Kuppers, p. 93.
2See McMullin.
3See Russell, Murphy, and Isham; Johnson; Polkinghorne.
4Athanasius, 2.2, 2.28, 3.65.
5Barth, pp. 179 ff; pp. 297 ff.
6Stoeger, p. 183.
7von Bertalanffy, p. 23.
8Laszlo, p. 47.
9See Zurek.
10See Gell-Mann.
11See Johnson.
12See Kauffman.
13See Waldrop.
14Ibid., p. 12.
15Ibid., p. 237.
16Ibid., p. 239.
18See Gunton: Augustine, 5.7, 8.11, 9.12, 10.3.
19Barth, pp. 479 ff.
20Rahner, pp. 110 ff.
21See Martland.
22Basil of Caesareâ, pp. 42 ff; Gregory of Nazianzen, pp. 217 ff.
23See Zizioulas.
24See Moltmann; LaCugna; Bracken; Gunton; Peters, *God As Trinity: Torrance, The Christian Doctrine of God.*
See Torrance, "God and the Contingent World."
See Russell, Murphy, and Peacocke.
See Edwards.
Romans 1:20; Augustine, 11:8.
Aquinas, 1/32:143.

The author dedicates this essay to his former teacher at Wheaton College (Illinois), Professor Mark Noll.

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