INTELLIGENT-DESIGN THEORY: AN ARGUMENT FOR BIOTIC LAWS

by Uko Zylstra

Abstract. A central thesis of intelligent-design theorists is that physical and chemical laws and chance are insufficient to account for irreducibly complex biological structures and that intelligent design is necessary to account for such phenomena. This assertion, however, still implies a reductionist ontology. We need to recognize that reality displays multiple modes of being beyond simply chemical and physical modes of being, each of which is governed by laws for that mode of being. This essay argues for an alternate framework for understanding life phenomena that is neither philosophical materialism nor intelligent-design theory.

Keywords: Michael Behe; biotic laws; William Dembski; enkapsis; intelligent design; naturalism; reductionism.

In the last few years proponents of intelligent design have made some valuable contributions in providing a thoughtful critique of philosophical and methodological naturalism as the reigning paradigm for science. Philosophical naturalism, or more specifically philosophical materialism, is the worldview resting on the belief that the material world is all there is; there is no nonmaterial reality that interacts with and/or influences material reality. Naturalism perceives the world as self-contained, autonomous, and subject only to intrinsic laws. Methodological naturalism—or "scientific materialism," the term that Kenneth Miller uses (1999, 27)—is essentially doing science within the framework of the assumptions of philosophical naturalism. Even if one does not accept the worldview of philosophical naturalism, it is commonly assumed by most scientists, including many Christian scientists, that methodological naturalism is the appropriate

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paradigm for doing science. This situation presents a dilemma for those who affirm some form of divine interaction in the world. The acceptance of methodological naturalism as the paradigm for doing science can readily lead to either a form of dualism in which the physical world is considered to be autonomous and self-sufficient with God only engaged with the spiritual dimensions of human life or to a form of deism in which God is simply the creator or first cause of the universe. Both deism and dualism leave little room for a belief in God that is personal *and* intimately involved with the created world.

A major question for the Christian theists, scientists or otherwise, is a proper understanding of the relationship of the created world to God, the Creator. The theist professes that "the world belongs to God." But what does that mean for an understanding of *how* the world is contingent[1] upon God? In what way is the theist to understand the sovereignty of God? This topic continues to generate extensive debate among those interested in the relationship between science and religion.

The intelligent-design theory that William Dembski, Michael Behe, and others propose is in some ways a natural response of theists to a reflection on the nature of this world. Design in nature seems to be readily apparent to those who affirm that the universe is created by God and that it is created with order and a structure that is intelligible. For the theist the design and structure of the world affirms the belief in God, though such belief is not dependent on the recognition of design in the world. Even in scripture God frequently self-reveals as the Creator God, as one who is always engaged with the creatures he has made.

The intelligent-design (ID) school of thought can perhaps be traced back to British natural theology of the late eighteenth century in which William Paley and others argued for the existence of God from the evidence of design. Natural theology provided an important context for Charles Darwin in the development of his theory of descent with modification. William Paley's book *Natural Theology—or Evidences of the Existence and Attributes of the Deity Collected from the Appearances of Nature* (1802) was required reading for students in Darwin's day. This context is very important for an understanding of the thrust of Darwin's principal work, *On the Origin of Species by Means of Natural Selection* (1859). This classic is basically one long argument that the design we see in the world of living things is the result of natural selection and not the action of a Creator/Designer. It is important to note that Darwin doesn't necessarily repudiate design itself; he repudiates the causative agent of the design to be God. Even many present-day evolutionary biologists who affirm philosophical naturalism acknowledge "apparent" design. This design is considered apparent because their worldview of philosophical naturalism would not allow for any divine activity in the universe. All explanations must be

"natural," which is interpreted to be materialistic. Because Darwinian evolutionism supposedly provides a natural explanation not only for the origin of species through some process of speciation but also for all the intricate structural features, physiological processes, behaviors, and adaptations of organisms, it has become the reigning paradigm for biology.

The Inadequacy of Naturalism

A major problem, however, arises when philosophical naturalism provides the criteria for what forms of explanation are legitimate in science. Only naturalistic or materialistic explanations are allowed as being scientific. This implies that any reference to or incorporation of divine activity is outside the bounds of science. Where does that leave the Christian theist who believes that God is actively engaged with the creation and that the creation is dependent upon God for its continuing existence? Must God be left at the laboratory door for a Christian to engage science? *Can* a Christian leave God at the laboratory door?

One option, which is employed by the ID theorists, is to refute the basic tenet of methodological naturalism that only naturalistic explanations are valid for science. Such naturalistic explanations are rooted in mathematics and physical/chemical laws. Material reality can and should only be explained by physical/chemical laws. Coupled with another basic belief in the principle of continuity of reality, it is affirmed that life arose from nonliving things through emergent properties of chemical and physical interactions of nonliving things. Furthermore, causation is limited to the primary causative agents of chemical and physical laws (necessity) and chance.[2] The basic argument of the ID theory in refuting methodological naturalism is that the natural causes of chemical and physical laws or of chance are inadequate for providing an explanation of many phenomena and things of our experience (Dembski 1999, chap. 5).

The ID theory proposes an explanatory filter as a means of recognizing design and consequently resorting to design as an appropriate form of explanation of certain structures and phenomena. According to Dembski, "whenever we infer design, we must establish three things: *contingency*, *complexity*, and *specification*" (1999, 128). Contingency, according to Dembski, implies that the structure is not the result of an automatic or determined process; it cannot be attributed to natural laws. Complexity implies that the structure or system could not readily be the result of chance activity. Specification ensures that the structure displays a pattern that reflects intelligent activity. If a structure or process can be characterized by all three of these features, design is inferred as the causative agent for that structure or process. Specification becomes an important criterion for inferring design, and Dembski has spent considerable effort in establishing the meaning and nature of specification.[3]

A key feature of ID theory is that design is postulated as a causal agent for phenomena in addition to necessity (natural law) or chance. The detection of such a causal agent is through the application of the explanatory filter that determines whether intelligent causation is the explanation for a particular phenomenon. The filter works by asking three questions: "Does a law explain it? Does chance explain it? Does design explain it?" (Dembski 1998b, 94). As Dembski points out, "the logic of the explanatory filter is purely eliminative—eliminating law and chance" (1998b, 109).

The ID theorists have applied the explanatory filter most successfully in an analysis of the biological world in pointing out that many biological phenomena are inexplicable by physical and chemical laws (necessity) or by chance. Some of the best examples are provided by Behe in his book *Darwin's Black Box* (1996), in which he makes a strong case for the irreducible complexity of several biological structures and systems. Some examples he gives of irreducibly complex systems are the cilium, the bacterial flagellum, biochemistry of vision, and the blood-clotting system. The thrust of his argument is that all of the components of the structure or system need to be in place for the system to function. A structure in which some of the components are missing simply will not function. Precursor forms which lack some of the components or in which some components have variant structures for a different function would thus also not be functional since all the necessary components would not be in place. As a consequence, precursor forms would not be selected for the particular structure in question because there would be no selective advantage for those forms. Selective advantage for other functions that the precursor form might have does not provide advantage for a new or different function. In view of this, Behe asserts that Darwinian evolution with its focus on natural selection is unable to account for the evolution of irreducibly complex structures. Behe thus concludes that such structures are indicative of being designed.

Behe's book has generated a great deal of controversy and has received much criticism from evolutionary biologists. Frequently, this appears to be a defensive stance from evolutionary biologists who perceive it, consciously or unconsciously, as a critique of their evolutionary materialist worldview. But one must keep in mind what Behe is specifically challenging in his book. He is not challenging evolution as such; he finds "the idea of common descent (that all organisms share a common ancestor) fairly convincing and [has] no particular reason to doubt it" (1996, 4). Behe is challenging primarily the process and the chief mechanism of the process of evolution: Darwin's "descent with modification" with natural selection as the principal means of modification. Rather than welcoming the dialogue and critique of an aspect of a biological theory with the challenge to further develop the theory, the strong verbal attacks on Behe are perhaps indicative of the fact that the evolutionary materialist worldview is being undermined.

Various Meanings of Evolution

When discussing evolution, it becomes necessary to distinguish the various meanings of the word in order to avoid miscommunications and pseudo criticisms. Keith Stewart Thomson has written a very useful essay on the meanings of evolution that is very applicable to this discussion (1982, 529–31). Thomson distinguishes three basic meanings: evolution as pattern, evolution as process, and evolution as mechanism. It is important to recognize that there is considerable empirical evidence for evolution as pattern as seen, for example, in the fossil record, morphological homologies as well as similarities in DNA sequence information. It is largely this type of evidence that convinces many people (perhaps including Behe) of the common ancestry of organisms. There is scant empirical evidence, however, for evolution as process—the actual steps that may have brought about the pattern of evolution that we observe. Furthermore, although there is empirical evidence for natural selection as the mechanism for evolution in several cases, there is scant direct empirical evidence for the actual mechanism that brought about all the processes of evolution apart from the general covering statement that natural selection is the basic mechanism for all such processes.

Behe addresses primarily the proposed mechanisms that are presumed to account for the process of evolution. In particular, Behe questions whether the gradualism of Darwinian natural selection is able to account for the process. Many of the critics of his book fail to recognize or at least fail to respond to that primary issue. Their responses typically focus on an appeal to the truth of the pattern of evolution without providing what Behe states is woefully lacking in evolutionary theory. Bruce Weber's critique of Behe's book (1999) illustrates this problem. On one hand, Weber criticizes Behe for his selective scholarship in not addressing fully the research that has been and continues to be done in molecular evolution. However, much of the research Weber references provides evidence for the pattern of evolution, such as sequencing information, rather than evidence for the process or actual mechanisms of evolution. Weber also acknowledges the as yet intractability of understanding the mechanisms by which the supposed irreducibly complex structures may have arisen, the very point that Behe is actually making. Weber may well be correct in his concluding comment "that the proper study of biological complexity is its emergence, its developmental trajectories, and its evolutionary lineages" (Weber 1999, 603); however, these studies do not yet answer the fundamental question that Behe is addressing.

A similar weakness is present in the critique of Behe's analysis by Miller, who frequently interprets Behe as rejecting the idea of evolution rather than simply natural selection as the causal agent for accounting for the irreducible complexity of living cells (1999, chap. 5). Miller constantly

interchanges the terms *evolution* and *natural selection* as if they were one and the same thing. Since the idea of evolution has been substantiated by so much empirical evidence, Miller believes that he has refuted Behe's central claim against Darwinian natural selection. Here again, the lack of making critical distinctions between pattern, process, and mechanism in the idea of evolution in accounting for irreducibly complex structures makes his critique of Behe largely irrelevant.

The Reductionism of Intelligent Design

The ID theorists consider the evidence for irreducibly complex structures and specified complex information systems as evidence for intelligent design as the causative agent for such structures and phenomena. It is worth noting that most of the examples of ID theorists are in the realm of living things. But why is it that structures and processes in the biology world appear to reflect design more so than in the nonbiological worlds? I think that a deeper problem is involved. The assertion that irreducibly complex structures such as the structure and function of the eye or the bacterial flagellum must be attributed to intelligent design still implies the acceptance of a reductionist ontology. This, I believe, is a fundamental weakness of the ID theory paradigm. The issue at hand has been and continues to be a central question for biology: Are living things radically different from nonliving things? Are life phenomena simply a special case of physical/chemical phenomena, or are life phenomena to at least some degree irreducible to physical and chemical explanations? There are various ways to phrase this question, but it ultimately comes down to whether living things are only physical/chemical things, subject only to physical/chemical laws. Is biology reducible to chemistry and physics? Or are life phenomena subject to ordering principles (laws) that are different from and in addition to physical and chemical laws? If living things are irreducibly complex, what accounts for such complexity?

This central question has been and continues to be one of the defining questions in the history and philosophy of biology. It was at the heart of the mechanism/vitalism controversy in the nineteenth century, the rise of organicism that replaced vitalism as the antidote to mechanism in the twentieth century, and, in my view, it is at the heart of the discussion about intelligent design. I agree with the proponents of ID theory that a reductionist/mechanist interpretation of the living world arises from or is motivated by a philosophical materialism: matter is all there is. The term *physicalism* would be an appropriate designation for such a worldview. The worldview of materialism has difficulty accounting for a nonmaterial reality, whether that be mind, consciousness, emotions, or even life itself. As a consequence, biologists who adhere to a philosophical materialism are forced to propose concepts such as emergent properties and self-organization to account for life phenomena and for irreducibly complex organizations in

the hierarchical structure of living systems. These concepts, however, are somewhat vacuous unless a precise explanation can be provided for the emergence and self-organization. Different levels of structure in the hierarchical organization of living things do reveal different properties. We may perhaps refer to such properties as emergent if we mean only that they are new properties, not present in lower hierarchical levels. But doing so cannot mean that we have explained such properties on the basis of the structures and entities constituting the lower levels. Such an explanation is still required for the many so-called emergent biological structures and phenomena.

As a biologist I find many suggested explanations for emergent properties unsatisfying. They fail to adequately account for the multidimensional aspects of our experience of living things. I have attempted to analyze and critique some of these explanations in a previous publication on hierarchy theories in biology (Zylstra 1992). Central to my critique is the notion that living things are subject to more than physical and chemical laws. In this regard I very much support and appreciate the analyses of the ID school of thought in its arguments that living things possess structures and express phenomena that cannot be explained by physical/chemical causality.

But what does bring about the presence of irreducibly complex structures and the existence of complex hierarchical living systems in which the whole cannot be explained by the sum of the parts? What accounts for the interrelationships between wholes and parts?[4] Is intelligent design an adequate explanation for such biotic structures and phenomena? Does ID provide the causality for living things, especially those structures and phenomena that cannot be accounted for by physical or chemical laws? And, if so, in what manner does it provide causality? Is ID really more than an affirmation that the universe is created and upheld by an intelligent being or by a Creator God? In what way do explanations for organized complexity by intelligent design differ from explanations by chemical and physical laws for physical structures and phenomena? Are not structures that are governed by physical and chemical laws also designed? Is the latter type of design of a different nature than other types of design such as, for example, that revealed in living things? How is the concept of intelligent design related to the notion of the contingency of the creation to the Creator? What does contingency mean with regard to structures that are governed by chemical and physical laws? or are only structures caused by intelligent design contingent upon the intelligent being?

I commend the critical analyses by ID theorists as to whether Darwinian natural selection can account for irreducibly complex structures. Evolutionary biology, I believe, is in need of such critical analysis. The failure to acknowledge the shortcomings of Darwinian evolution as explanatory for the process of evolution is the source for the rejection of evolutionary

theory by many persons. Nevertheless, I am not convinced that the concept of intelligent design provides an adequate alternate explanation for the nature of being of living things. In my view ID theory still works from the assumptions of a reductionist ontology, that this world is governed by only chemical and physical laws. Furthermore, similar to the viewpoint of physical materialism, ID theorists appear to consider such chemical and physical laws as autonomous, not as a form of contingency upon God. This reductionism implies that living things are also subject to *only* chemical and physical laws. The idea that living things are subject to biotic laws in distinction from and in addition to chemical and physical laws is foreign to a reductionist mindset. But it also appears to be foreign to ID theory. Such reductionist thinking is revealed in a basic perception, common among biologists, that life is characterized by living matter. Living things are generally perceived as constituted of living matter. But the conceptualizing of living things as consisting of living matter exposes the core of the problem: How can matter be alive? To reduce a living thing to its material components is to strip away the very character of its being alive! Living things, however, reveal a nonmaterial (viz., nonphysical) dimension that cannot be captured by its material constituents.

So how do we account for the phenomena of life? We need to begin with the recognition that all of reality is law-governed. There is no structure or process that is not subject to laws or ordering principles. Science itself would not be possible in a universe that is not ordered or not governed by laws. This includes life phenomena and the irreducibly complex structures and systems that are characteristic of living things. The patterns of structure and function revealed in living things indicate that living things are indeed subject to ordering principles (laws). Without being subject to such ordering principles, life phenomena could not even be studied or observed.

The proponents of ID theory, however, seem to dissociate intelligent design from any natural laws. Intelligent design is posited as a causative agent apart from or in addition to chemical and physical natural laws. Does this imply that God then interacts with the natural world through two different avenues: through natural laws and through the implementation of design in some way outside of natural law? Or are natural laws perceived as autonomous, free from any relation to God as the sustainer of creation through laws, whereas intelligent design implies contingency of certain structures to an intelligent being? I find this just as problematic as autonomous principles of self-organization of irreducibly complex structures for an explanation to account for living things. It indicates a sort of scholastic dualism that splits reality along the line of nature/supranature. To avoid such a dualism, we need instead a more comprehensive perception of laws and the recognition of a diversity of natural laws including biotic laws for living things.

NATURALISTIC THEISM

One significant negative consequence of the scholastic nature/supranature dualism is the development of a view of nature as being autonomous and self-existent. God is largely confined to the realm of supranature. When God is engaged with nature, such interaction is then seen as an interruption of the natural course of causality in nature. God is thus perceived as intervening in the natural laws that govern nature even when such laws are considered to be established by God in God's creative actions. This nature/supranature dualistic view of God's interactions with the world has resulted in some abiding tensions and conflicts between theism and science. David Griffin summarizes these tensions quite clearly in his book *Religion and Scientific Naturalism: Overcoming the Conflicts* (2000). According to Griffin, the fundamental conflict arises because the mechanistic, modern scientific worldview can accept only natural causes for the material, physical world. This worldview rejects any divine action in the world because divine action is seen as interrupting or intervening in the natural laws. Such divine intervention would undermine the very a priori foundation of science that assumes that the fundamental principles of causality are never interrupted. This certainly helps to explain the strong negative reaction to ID theory by many members of the scientific community. To the extent that intelligent design is indicative of special divine action, this action is perceived as an intervention in the normal physical/chemical causality in an autonomous, self-existent nature. A fundamental weakness among ID theorists is that they have failed to provide an adequate coherent view of God's interaction with the world. If they continue to theorize within a nature/supranature paradigm, they will have difficulty incorporating intelligent design within scientific theorizing, because the latter is focused on nature rather than supranature.

Griffin attempts to resolve this conflict of a nature/supranature dualism by proposing a naturalistic theism that accepts divine action in the world as a divine-creaturely cooperation but rejects a supranatural divine being that acts by way of interrupting natural causation. Griffin's naturalistic theism, however, strikes me as being a form of synthesis in which the divine is necessary to account for events such as nonsensationist phenomena and ethical and religious experience, experiences that are difficult to explain or account for by physical/chemical causality. Because Griffin cannot accept a divine interruptive action from without, he proposes a divine presence within nature, a presence that acts in a persuasive rather than in an intervening, coercive manner (2000, 93). Whether this type of synthesis, which attempts to combine a radically altered form of theism with a radically altered form of naturalistic science, will withstand the critique of both science and theology remains to be seen. Though I think that Griffin is correct in rejecting scientific naturalism with its reductionism (2000,

176), the solution to such reductionism is not in redefining matter to include the divine as being present in matter.

What I do find interesting in Griffin's naturalistic theism is the theoretical potential that such a view has for ID theory. Apart from the personal beliefs of the ID theorists, the arguments that they propose for intelligent design do not necessarily entail a supranatural divine being. The intelligent design could just as well be caused by the persuasive divine action of the immanent universal soul or mind that Griffin proposes. In other words, the actualization of the "eternal forms" that are the "material of the divine persuasion" (Griffin 2000, 293) could well be the intelligent design that Behe, Dembski, and others are claiming exists in the universe.

Even though a persuasive form of divine action might be somewhat more palatable to a Darwinian evolutionist than a coercive form of divine action, Griffin's naturalistic theism still runs counter to much of Darwinian evolution, as he himself makes clear in the rejection of different meanings of evolution (2000, chap. 8). For example, the eternal, ideal forms of naturalistic theism would be soundly rejected by Ernst Mayr, a leading evolutionary biologist, in his rejection of any form of essentialist and/or typological form of thinking (Mayr 1982, 38–39). Furthermore, all the criticisms of intelligent designs not being testable, etc., are presumably also applicable to the universal divine mind as a persuasive casual agent in the universe.

Another alternative viewpoint to scientific materialism is the Robust Formational Economy Principle proposed by Howard Van Till,[5] who has been a harsh critic of ID theory. His criticism centers on the view he perceives as entailed by ID theory that an intelligent agent (a divine being) must act in an intervening manner to bring about the designed structures and systems present in the universe. Van Till argues that the creation is "fully gifted" (1999, 173) such that the development in the creation occurs without any "ontological gaps." There is no need for God to interrupt the causal principles in nature and to add to the capabilities in the creation in a form of episodic creationism. In other words, according to Van Till, the creation is endowed with a "Robust Formational Economy Principle" (RFEP) that provides for the actualizing of all the potentialities that become realized in the "creation's formational history" (2000, 214).

This RFEP, however, is in need of some further analysis. One question is whether it is primarily an epistemological principle providing some account for things that we do not fully understand or whether it is an ontological principle providing some form of causality to creation's formational history. If it is an epistemological principle, it would appear to function as a different form of the "God of the gaps" in attempting to provide an explanation for a developmental or evolutionary process that we do not fully understand. If it is an ontological principle embedded in the creation as a formational capability, what then is its ontic status, and how does it

function as a principle of causality? It seems that whatever novel structure appears or unfolds in creation's formational history is due to this principle. The entities in the creation become redefined such that they now possess whatever capabilities are needed for forming other more complex structures through some form of self-organization. For example, "molecules possess the capabilities to interact in ways that lead to their organizing themselves into molecular ensembles having still more remarkable capabilities, perhaps even the capabilities that constitute life" (2000, 214). One might ask whether this capability resides in the molecules themselves or whether it resides in the creation as a whole. In other words, the creation may have the capabilities for forming living things but not the atoms and molecules. Even the term *robust* seems to imply capabilities that extend beyond the capabilities of the chemical and physical entities subject to chemical/physical laws. Furthermore, one might argue, it is not the creation that is actualizing the full array of potentials but God actualizing the capabilities through God's laws for creation. I would argue that the "robustness" of the creation really implies biotic laws that provide the causal principles for the "creation's formational history."

Both of these views involve a revised understanding of the concepts of matter. Both views appear to be driven by a reaction to a concept of God as an *intervening* divine being. Perhaps what we need in place of these is a nonintervening supranaturalism, a view in which God is continually engaged with and upholding the creation in all of its modes of being.

Law as the Relation between God and Created Reality

This leads to another option in response to methodological naturalism for a theist who believes that God is actively engaged with the creation. We need to recapture or rethink the meaning of law as the relation between God—the Creator—and the creation and all things in the creation. This involves a deeper analysis of the nature of *things* as well as of *living things*. My own framework of analysis is very much influenced by the philosophy of the cosmonomic idea, or the philosophy of the law-idea, proposed by Herman Dooyeweerd, a Dutch legal philosopher who spent considerable effort in such an analysis.[6] I am convinced that Dooyeweerd not only provided an important critique of scientific thinking, which views the world as autonomous, but also made a major contribution to the analysis of modes of being of reality.

For Dooyeweerd, law is the relation between God and all of creation. All of reality is conceived as law-governed, as subject to God's laws for reality. Law is the very condition for the existence of created reality, including living things. Everything that exists can do so only insofar as it is subject to the laws for its existence and behavior. Without the structural laws, for example, for an oak tree or a squirrel, there would be no oak tree

or squirrel. Such laws are typically referred to as natural laws.[7] Natural laws are here conceived as structural laws as opposed to normative laws that hold for human behavior and can be disobeyed by human subjects. Furthermore, natural laws are not limited to or exhausted by chemical and physical laws. There is a differentiation of laws that hold for each of the differentiated modal aspects of reality including the biotic mode of being. Biological structures and phenomena are also law-governed, and biological structures or phenomena are accounted for because they are subject to biotic laws in addition to chemical and physical laws.[8] Does that eliminate intelligent design? I do not believe so. I would affirm that all of reality is contingent upon the Creator and that all law-governed reality is indicative of intelligent design. Natural laws, including biotic laws, are the very foundation for the presence and recognition of intelligent design in the world. Chemical structures also reveal design, even though such structures are governed by chemical and physical laws for the material world and thus can be accounted for by chemical and physical laws.

Dooyeweerd's analysis is perhaps best illustrated in his discussion of the structure of a thing (1957, vol. III, chap. 2). Dooyeweerd conceived of each thing has having two dimensions, the law side and the subject side. It may be helpful to conceptualize these dimensions as two halves of a sphere, with one half being the law side and the other the subject side as illustrated in Figure 1. The subject side is the actualization of the law side. This conceptualization points out the important distinction between the law side and the subject side of each thing. We experience the law-governed nature of reality through the subject side of each thing, viz., as each thing is subject to the law structure (indicated by the lines in the figure) for the things in the created world. We do not experience the law side of each

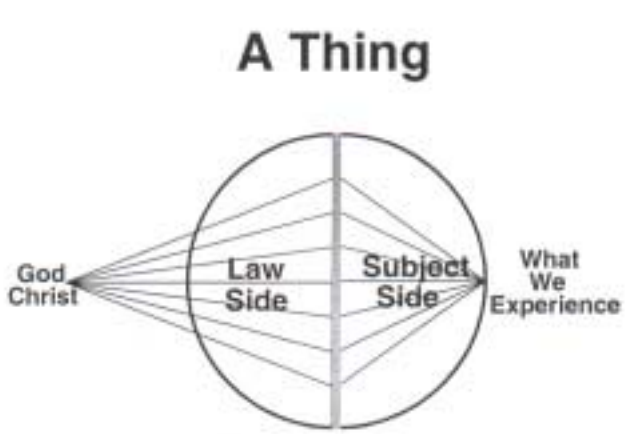

Fig. 1. A diagrammatic presentation of a thing. Note the nature of law as the relation between God and each thing.

thing directly. The laws that hold for each individual thing are in themselves inaccessible to our direct experience. We experience the things of the created world only as they are subject to the laws that hold for the individual structures. As a consequence, our understanding of the laws for reality are necessarily indirect and imprecise. We can only begin to approximate the character of natural laws in our minds. In this regard, an important distinction must be made between our description of the law and the law itself. Our descriptions or law statements are not the governing principles themselves. We can describe the patterned behavior of things and formulate law statements only because things are subject to laws. Even what we call the law of gravity is only a (quantitative) description of our experience of how things are subject to the physical law for the attraction of bodies to each other. The failure to make this distinction between laws and human law statements has led to frequent confusion over the proper understanding of law as the condition for the existence of all the structures in the created world. Perhaps that is one reason why there seems to be an unfortunate reluctance to even refer to laws as governing principles for reality.

Even if one rejects the notion that laws are the relation between God and the creation, that does not necessarily lead to a denial of the existence of laws. Reality is still ordered, and that order reflects ordering principles or laws that account for such order. Scientific inquiry assumes and requires an ordered universe as the foundation of any inquiry. In such a perspective, laws would presumably be immanent, originating or residing within each thing, as indicated in Figure 2. Each thing is subject to differentiated laws that govern the existence of each thing. For living things, that would include differentiated biotic laws that hold for biotic phenomena.

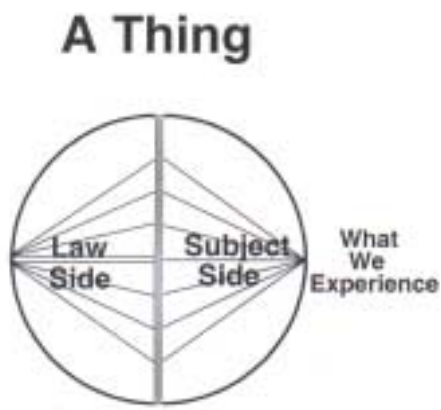

Fig. 2. A diagrammatic presentation of a self-existent thing in which the law is seen as immanent.

BIOTIC LAWS

Having said this, can we begin to formulate some law statements for biotic phenomena that reflect living things as law-governed structures and phenomena? We typically recognize laws through regularities and patterns in the world of our experience. To begin with, some law statements that are a description of biotic laws would be (1) the law that, in reproduction, like begets like; (2) the law of cell division that all cells come from cells; (3) the law of natural selection; (4) the laws of mating and courtship that define many forms of animal behavior; and (5) the laws of development that define the various regularities and patterns that we observe.

It might be helpful to provide an expanded discussion of a biotic law such as the law of cell division. Cell division is a phenomenon that in its regularity and precision appears very much to be governed by biotic ordering principles. There is a complex pattern of integration of cellular and molecular activity that characterizes the cell-division process. Numerous cell-division cycle genes and proteins have already been identified that play an important role in the regulation of the cell-division process. Nevertheless, the process of cell division is a feature of the cell as a whole, not of the collection of genes and proteins that are involved in the cell-division process. Regulatory molecules of cell division do not themselves govern the cell-division process. The genes and proteins are bound to the cell as a living entity. As molecules, proteins and nucleic acids continue to function as chemical and physical structures within the cell and are subject to chemical and physical laws. But their specific roles and activities are orchestrated by the cell as a whole. The cell is subject to ordering principles that govern this orchestration in the spatial and temporal configuration of the cell. For example, the division and migration of the centrioles, the spatial organization of the mitotic spindle, the supercoiling of the chromosomes into compact structures, and the sequential timing of all these dynamic events are indicative of ordering principles that go beyond the properties of the molecular constituents. There is a cell program that supersedes the genetic program that provides the information for the synthesis of the numerous proteins and other molecules that play a critical role in all of these activities. This is essentially the point that Steven Rose makes in his critique of reductionism in his book *Lifelines:* "the functioning cell, as a unit, constrains the properties of its individual components. The whole has primacy over its parts" (Rose 1997, 169).

THE THEORY OF ENKAPSIS

This relationship of molecular constituents to the cell as a whole or, more broadly, of components of one level of organization that are enclosed within a higher level of organization Dooyeweerd refers to as an enkaptic relationship.[9] A key element of the theory of enkapsis is that the constituents of

the lower level are seen as wholes within a higher level rather than merely as parts of a higher level as in the concept "the whole is greater than the sum of its parts." Whole-whole relationships differ from part-whole relationships. In a part-whole relationship the parts are qualified by the same function as that which qualifies the whole. Thus, if the whole is qualified by the biotic function because it is governed by biotic laws, the parts would also be qualified and governed by biotic laws. That would imply that molecules within cells are also governed by biotic laws that govern the cell as a whole. This is simply not the case. Molecules within cells retain their integrity as molecules, subject to chemical and physical laws, and thus as wholes rather than parts. The cells, in turn, are subject to biotic ordering principles, and they embrace (encapsulate) the molecular entities that are enclosed within the cells. That encapsulation finds expression in how the molecular constituents are orchestrated in their chemical functioning within the cell such that the cell functions as a living entity, a living whole. Does this orchestration reflect intelligent design? It does in the same way that the structure of the solar system or of a hemoglobin molecule reflects design. But the design is attributable to some biotic laws analogous to the physical and chemical laws that bring about the design of molecules and solar systems.

The same thing would apply to the irreducibly complex structures and systems that Behe claims are planned and designed (1996, chap. 9). I would agree with Behe that "Life on earth at its most fundamental level, in its most critical components, is the product of intelligent activity" (p. 193). But the intelligent design itself is not the causative agent. Rather, it is the designer working through biotic laws for the structure of the bacterial flagellum, through biotic laws for the structure of the cilium, and through biotic laws for the blood-clotting system that bring about such structures and processes. The same applies to the unfolding of organisms during development from the zygote to the adult organism. Morphogenetic processes occur in an organism subject to the governing laws for the development of that organism. Such development involves the expression and regulation of hereditary information. The emphasis cannot be on the expression of the hereditary information but on how the organism enkaptically incorporates that information in its morphogenesis. The same concept can be applied to evolutionary development of organisms. Organisms are not the result of mutations and selection of hereditary material.[10] They are the result of biotic and morphogenetic laws that hold for the development and evolution of organisms. In this regard we must recognize, with regard to evolution, that living things may evolve; laws do not. Any evolution or development is subject to governing laws for such processes. It is precisely through such laws that God is interacting with creation to bring forth all the creatures and ecosystems that we observe. This is undoubtedly a form of evolutionary development but is radically different from a Darwinian,

materialistic, autonomous form of evolution. This form of God interacting with the creation is thus not one in which God intervenes in the creation or in which God interrupts the physical and chemical laws for the creation. Rather, it is one in which God upholds the creation through biotic laws as well as through physical and chemical laws.

CONCLUSION

Does this eliminate design? Not at all. It does, however, remove design as the immediate causative agent, emphasizing instead the fact that irreducibility of living things is due to the irreducibility of law structures for higher modes of being. This irreducibility is the basis for the irreducibly complex structures characteristic of living things. This irreducibility is also indicative of the discontinuity of levels of being and thus levels of organization. Higher levels do not simply emerge from lower levels; laws for higher levels do not emerge from laws for lower levels. Life is not some material substance that can be reduced in its analysis to chemical and physical properties. Life is a function of living things that are subject to biotic laws.

I believe that discussion about intelligent design is very beneficial but falls short of a proper account of reality. Design is present at every level of reality, including the physical and chemical levels. In fact, design is basically a reflection of law-governed reality, of the manner in which God interacts with all of creation.

NOTES

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1. I am using the word *contingent* in the sense of "dependent on or conditioned by something else."
2. A good example of this reductionist and mechanistic position is that of the Nobel Laureate Jacques Monod (1972).
3. In addition to Dembski's *Intelligent Design* (1999), see his technical analysis of specification in his book *The Design Inference* (1998).
4. Though the use of the word *parts* is commonly used in this context, I believe it is a misnomer, because for something to be a part entails that its structure and properties are defined by the whole. There are many components of living things, such as water molecules, that are not defined or determined by the cell or living organisms as a whole. For a further discussion of this see my analysis on part-whole relationships in Zylstra 1992.
5. For a presentation of Van Till's Robust Formational Economy Principle, see his articles on "The Fully Gifted Creation" (1999) and a "Partnership Response" (2000).
6. The presentation of Dooyeweerd's philosophy is contained in his four-volume *A New Critique of Theoretical Thought* (1957). A more readable introduction to the philosophy of the cosmonomic idea is provided by L. Kalsbeek (1975).
7. For an expanded discussion of the meaning of natural law see Stafleu 1999.

8. Dooyeweerd actually distinguishes the sensitive (psychic) mode of being that characterizes the animal world as a mode of being additional to the biotic aspect that, in his view, characterizes the plant world. He is attempting to provide the basis for radical distinctions between the plant and animal kingdoms of living things. I believe that his analysis is limited by the two-kingdom view that was prevalent at the time he developed his theory of modal aspects. In a previous article (Zylstra 1981) I argued for a further differentiation of modal aspects and distinguished between the biotic, morphogenetic, and sensitive (psychic) modes of being that qualified, respectively, the protist, plant, and animal kingdoms. For convenience, however, for the purposes of this essay I collectively refer to these three modes of being as the biotic mode of being.

9. For an expanded discussion of Dooyeweerd's theory of enkapsis see Part 3 in vol. III (1957). A summary analysis of the theory of enkapsis is also provided in my article "Living Things as Hierarchically Organized Structures" (1992).

10. Brian Goodwin (1994) provides an excellent critique of genocentric thinking and makes a strong case for an organocentric perspective.

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