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Glas, Gerrit; de Ridder, Jeroen

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Introduction to the Philosophy of Creation Order, with Special Emphasis on the Philosophy of Herman Dooyeweerd

Gerrit Glas and Jeroen de Ridder

Abstract In this introductory chapter, we provide some background to the main theme of these two volumes, to wit, creation order. We start with a quick historical sketch of how the traditional connection between the experienced orderliness of the world around us and the will of a divine Creator came under pressure as a result of various philosophical and scientific developments. We also show how scholars from Christian and other religious traditions responded in different ways to these developments. Next, we offer a brief overview of some key themes from the work of the Dutch philosopher Herman Dooyeweerd. We believe that his thought offers insights that can profitably be used to advance the contemporary discussion on creation order, as is evidenced by a number of contributions to these two volumes. The chapter closes with a brief overview of what can be expected in the chapters that follow.

Keywords Law of nature · Creation order · Herman Dooyeweerd · Reformational philosophy · Modal aspects · Christian philosophy

Context

This is the first of two volumes based on presentations that were given at the international conference “The Future of Creation Order,” organized by the (Dutch) Association for Reformational Philosophy in collaboration with the Department of Philosophy at Vrije Universiteit Amsterdam, at the occasion of the 75th anniversary celebration of the association, in August 2011. The purpose of the conference was to delve deeper into the current health of the philosophical concept of (creation) order and of such related concepts as law, structure, necessity, change, emergence, and principle.

G. Glas (✉) · J. de Ridder
Department of Philosophy, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands
e-mail: g.glas@vu.nl; g.j.de.ridder@vu.nl

In this introductory chapter, we will first provide a historical and intellectual update with respect to the theme of the conference, sketching how developments in the sciences and humanities led to the demise of the idea of a pre-given created order and presenting an overview of how scholars from Christian and other religious traditions have responded to this challenge.

We will then continue with a brief introduction to the systematic philosophy of Herman Dooyeweerd, one of the founders of what has become known as *neo-Calvinist* or *reformational philosophy*. This introduction enables readers to understand authors who develop and expound their ideas in discussion with this philosophy.

The chapter closes with an overview of the content of the book. The first part of this volume focuses on the philosophical discussion about creation order. The second part delves into the relevance of the creation order concept for the sciences and pays special attention to the notion of emergence. The third part of the volume investigates the possible role of theology and philosophy of religion with respect to the understanding of creation order.

Order, Orderliness, and Law

People of all times have experienced the natural world as expressing an overwhelming beauty, coherence, and order. In the great monotheistic traditions, this beauty, coherence, and order have been related to the will or nature of a divine Creator and this relation has been variously described with metaphors derived from the world of art, manufacturing, and agriculture. For a long time, philosophers found the notion of a divinely imposed order unproblematic. Natural philosophy transformed these lay conceptions into metaphysical concepts such as demiurge, first mover, highest being, and origin. This highest being was seen as the origin of *natural law*, which was reflected in the social and moral order of the world.

Things changed with the application of mathematical methods to issues that previously were dealt with in natural philosophy. The metaphysical order of natural philosophy became the object of scientific inquiry. Speculation was replaced by mathematics and mechanics, and the metaphor of the clock expressed the newly gained insight into the way the world was ruled (Harrison 1998).

The concept of law of nature emerged in this period. It not only reflected confidence in humanity's capacity to unravel the mysteries of the universe, but it also reinforced trust in God as the One who wills and maintains these laws (Harrison 2008). The Deist interpretation of the universe combined both: it maintained belief in God as sovereign monarch and it fostered trust in science as the way to read the book of nature.

Nowadays, scientists mostly ignore the theological background of the notion *law of nature*. As the Deist universe lost plausibility, the notion of a superior divine intelligence fell into disrepute and a deep and long-standing confusion about the status of laws of nature began. For one thing, laws denote both the way things are

and how they, in some sense, ought to be. The gradual disappearance of a Creator who is willing these laws weakened the support for the idea that laws of nature are willed and that they, therefore, hold with necessity (Clayton 2008). This is the background of the dispute between the so-called *regularity view* and *necessity view* of laws of nature (Armstrong 1983).

Evolutionary theory complicated the debate even more. The development of this theory mimicked developments in physics by replacing natural history, just like physics had replaced natural philosophy. The first edition of Darwin's *Origin of Species* drew an analogy between the law of gravity and the law of development. The law of development, he argued, would change our view of the organic world in much the same way as the law of gravity changed our view of the physical world. The laws of evolutionary biology soon came to be seen as deeply historical and contingent, challenging not only the theistic but also the deterministic view of laws of nature. Laws appeared to be nothing more than regularities or patterns holding for a certain period of time.

Reformational Philosophy

Ever since the emergence 75 years ago of the branch of Christian philosophy that has come to be called *reformational* (or *neo-Calvinist*) *philosophy*, the concepts of order and law (or principle, structure) have been at its heart. In fact, it is fair to say that this tradition can be characterized as a philosophy of creation order.

Among its central concerns is a long-standing debate over the nature of *law*: its origin, its status as boundary between God and creation, its validity, and its relationship to history and human agency. Firmly rejecting both scholastic metaphysics and Deism, reformational philosophers have maintained the notion of law as *holding for reality*, thereby preserving a variant of the necessity view of laws. However, questions have arisen about the nature of such laws. For instance, can the philosophical concept of law be equated with the concept of law in physics and biology? Or is it in fact a concept at the level of worldviews; that is, an articulation of a fundamental assumption about the origin, nature, and destiny of the world? Does *law* mean more than just “orderliness”? More recently, the issue has been raised as to whether laws of nature have always existed or, rather, “emerge” in the process of the disclosure of reality (Klapwijk 2008). There have been discussions on the universality of laws, on their possible susceptibility to change, and on the difference between law and the law-side of reality (see below). Developments in the life sciences have challenged the distinction between creation and temporal becoming—a distinction that has contributed to the acceptance of evolutionary theory by some of the major figures in the movement.

Enlightening as these discussions have been, it is also widely acknowledged that they are far from finished. Some critics of reformational philosophy, for example, still tend to interpret its view of law and of order as a variant of Deism, Platonism, or Aristotelianism (for a discussion, see Wolters 1985; Henderson 1994, chap. 5;

Echeverria 2011). Others have reproached it for offering a fundamentally static, essentialist, and/or monarchical conception of order (see Chaplin 2011, 51–54; Strauss 2009, 201–204). Theologians have questioned the implicit assumption that it is possible to gain access to creation order independent of the cross and of mediation by the church (see Douma 1976). How cogent and compelling have reformational theories of law and order been if, 75 years later, they are still confronted with criticisms such as these (for earlier discussions, see especially Van der Hoeven [1981, 1986])?

The Current Debate in the Sciences and Humanities

In addition to what has been said about the theological roots of the notion *law of nature* and the ambivalences surrounding it, there are at least three major theoretical developments that have helped shape the current debate on the nature of law and (creation) order and especially its application to man and society: (1) evolutionary theory, (2) postmodern and constructivist social theory, and (3) philosophy. Although in the remainder of this book much emphasis will be put on the anthropological, social, and moral dimensions of creation order, it is good to keep in mind that the very idea of law itself cannot be seen apart from its theological reminiscences.

1. *Evolutionary theory* has exerted an enormous influence on the way we conceive of ourselves and the world. If the living world is the product of accident and chance, then order can be, at best, the product of a process of development, but never its presupposition. Order, in other words, is neither pregiven nor unchangeable. If the evolutionary account of order is true, then it appears that not only the living world but, more specifically, the existence of the human race itself is utterly contingent. Evolutionary theory, especially in its ultra-Darwinist renderings, has eroded the distinctness of humankind and the intuition that we are “at home in the universe.”
2. The *social sciences* have contributed via other routes to the demise of order and lawfulness. Historicism and postmodernism have been especially influential and dominant, propounding the view that order is constructed and should be seen as the product of human interaction and interpretation. Society, therefore, will inevitably be “plural.” This plurality initially denoted a factual condition but gradually evolved into a directive norm—i.e., “pluralism.” On such a view, there can be no universally valid rules and norms. Such rules and norms are simply reports of particular standpoints, whether personal or shared with the like-minded, but never a reflection of a moral order transcending human (inter)subjectivity.
3. *Philosophy*, finally, has also been of critical importance in the dramatic change of perceptions of order in our time. Philosophy was the birthplace of historicism and postmodernism. Together with Marxism, Nietzschean perspectivism, existentialism, and critical theory, these traditions were responsible for the downfall of the classical philosophical conception of order. Philosophers drew subversive

conclusions from the life sciences and announced the fundamental contingency of human existence.

Today's intellectual climate seems to be shifting and may bring us to the verge of a significant reorientation. Even the discipline of economics—probably the most persistently modernist among the social sciences—is in disarray after the near-catastrophic financial crisis of 2008 and later. Standard models of economic equilibrium have been discredited in an unprecedented way. Fundamental reflection on the presuppositions of economic order is called for. It seems we have been confronted with boundaries that cannot be violated without damaging repercussions—not least in the possibly irreversible destruction of a sustainable natural environment.

Signs of a reorientation are also noticeable in other areas. Cultural anthropologists are looking for models that go beyond standard constructivist approaches. Social and political scientists are seeking concepts that may deepen or even replace the usual language of a limitless pluralism. Even the discipline of public administration shows renewed interest in such notions as *reasonableness* and *fairness*. Psychiatrists are trying to find a way beyond the uneasy dichotomy between naturalist (biomedical) and constructivist approaches to disease. In short, there are signs that scholars in at least some fields are trying to unearth order again by looking for a middle ground between antiquated, static conceptions of order and newer approaches which give priority to contingency and plurality.

Christian Philosophical Responses

Christian philosophers have responded in different ways to the downfall of order.

Hermeneutically oriented Christian philosophers have mainly concentrated on the issue of plurality and have argued for a position that draws a distinction between plurality and pluralism. Recognition of plurality does not imply full-blown relativism in ethics, they have suggested. The issue of relativism itself needs to be scrutinized because it seems to presuppose some form of absolute and/or objective truth. Charles Taylor has developed an approach to plurality by relating it to the even more fundamental notion of recognition.

Christian philosophers inspired by *Anglo-American* (analytical) philosophy have concentrated on logic, language, knowledge, and the semantics of possible worlds. Their conceptual armory has helped lay bare foundationalist tendencies in both naturalist and (creative) antirealist accounts. As a response to both naturalism and creative antirealism, Alvin Plantinga (2000) has developed the idea of *proper function*—with the idea of (divine) design in the background. Nicholas Wolterstorff (1995, 2008) has cleared the ground for a philosophical understanding of the claim that God speaks and, recently, for a theistic conception of justice and human rights (albeit one set against a notion of “justice as right order”). All this work has been enormously important for the preservation of philosophical ground for notions such as *law*, *design*, and *intrinsic quality*. However, much work still needs to be done in

relating this philosophical work to discussions in the life sciences and social sciences.

Neo-Thomist philosophers have made significant advances in reformulating classical notions of law, substance, and natural order. Moreland and Rae (2000), for instance, have argued for a substantialist account of human nature and for a concept of the person that is firmly rooted in a substance view of the soul. They see both contemporary philosophy of mind (especially the approach known as non-eliminative physicalism) and postmodern philosophy as threats to the classical Christian doctrine of humanity, and argue for the continuing importance of the idea of natural law. This argument is echoed in the recent encyclical *Caritas in Veritate*, which urges that truly compassionate responses to human need must remain rooted in stable moral truth.

Christian thinkers in the tradition of *radical orthodoxy* distance themselves from modern notions of order conceived as absolute, rational, and universal order. John Milbank, for instance, argues for an approach that does not focus on an independent creation order as point of departure for ethics and political theory but rather calls for a “counter-ontology” and a “counter-ethics” narratively constructed by the church, as an *altera civitas*, and based on her specific experience of participation in divine, creative love (Milbank 2006; Milbank et al. 1999). Such a counter-ontology would, they propose, help us discern again the deeper intentions of classical Christian notions of metaphysical order, which have been obscured in Christian capitulations to modernity.

Christian thinkers inclined toward *process philosophy* and/or *chaos theory* have also distanced themselves from classical concepts of natural law and creation order, and tended to a view in which God is seen as creative counterpart in the process of the development of creation from its inception. According to Ian Barbour (1997), we should give up the monarchical view of an almighty God who rules the world through unchangeable laws. We must instead be open to a *panentheist* view in which God participates in reality. This participation should be “located” in the openness and indefiniteness of creation, in the receptive side of both the living and the non-living worlds. In this approach, order is temporal and, therefore, inevitably in constant change.

Finally, some Christian philosophers in the tradition of *reformational philosophy* have been ready to give up the idea that biological species are rooted in an originally given creation order, yet without distancing themselves from the idea of creation order as such. They have not been unanimous, however, in the way they characterize the laws by which such order is constituted. Are laws best understood as philosophical concepts referring to the boundary between God and creation, as knowable structures such as physical laws, or as terms referring to the theological notion of divine providence? And should the notion of order be conceptualized in terms of dynamic principles that are waiting for (various forms of) disclosure, or as a fixed, pre-given order? With respect to societal and moral order, reformational philosophers have often proposed that a knowable framework exists of *structural principles* or *normative structures* for social institutions. However, there is a variety of

interpretations of these principles and structures, both with respect to their nature and to the range of their possible implementations (or *positivizations*).

To summarize, the impetus for the conference and, therefore, for the contributions in these two volumes comes from two sides: on the one hand, rapid developments in the natural and social sciences, the humanities, and particularly philosophy; on the other hand, the challenge presented by the wide diversity of views in Christian philosophical circles. Both evolutionary theory and social philosophy challenge the idea of the pre-givenness of norms, laws, and structures. They suggest that there are no such norms, laws, and structures and that what we know under this heading are products of either the process of natural selection or human construction and subjective interpretation. Christian philosophers have responded to the collapse of order in a variety of ways. There are strands of Christian philosophy that still argue for the idea of a pre-given, if not fixed, world order. Other scholars, however, see this idea of a stable creation order and/or natural law as redundant and in need of thorough rethinking. These two volumes give a sketch of the landscape and are an attempt to answer the question whether there is still room for affirmation of pre-given norms—or what one could call *ontic normativity*—while also acknowledging the particularity and “situatedness” of our articulation of those norms.

Herman Dooyeweerd: A Short Introduction

Since many contributions in these volumes refer to and make use of terminology that was originally developed in Dooyeweerd’s systematic work, we will give a brief introduction to some of these terms and the fundamental ideas behind them.

Herman Dooyeweerd (1894–1977) was one of the founders of what has become known as *reformational philosophy*. He developed his philosophy in the interbellum, in an intellectual climate that was characterized by uncertainty, deep divides between philosophical traditions, and the presentiment of the decline of Western culture.¹ A former president of the Royal Dutch Academy of Arts and Sciences once called him “the most original philosopher the Netherlands has ever produced, even Spinoza not excepted” (Langemeijer, quoted in Kalsbeek [1970, 10]). Dooyeweerd studied law and philosophy at Vrije Universiteit Amsterdam. He had a brief career in public administration before he became secretary of the Abraham Kuyper Foundation, a precursor of the scientific institute of the Anti-Revolutionary Party, one of the Christian political parties in the Netherlands before World War II. Dooyeweerd worked there between 1922 and 1926. From 1926 until his retirement in 1965 he was professor of philosophy and history of law at Vrije Universiteit Amsterdam.

¹ Dooyeweerd himself also refers to the popular and highly influential book *The Decline of the West* (*Der Untergang des Abendlandes*) by the German thinker Oswald Spengler, of which the first volume appeared in 1918.

He wrote extensively and had an almost encyclopedic knowledge not only of philosophy and the history of philosophy (in particular neo-Kantianism and ancient philosophy), but also of the sciences of his time, especially mathematics, physics, biology, law, and social and political sciences. Most of his ideas in systematic philosophy were developed and refined in the interaction with the sciences.

To understand Dooyeweerd's philosophy it is useful to keep in mind that it is built up around two main themes: (1) the distinction between what he called different *modal aspects* (or ways of functioning); and (2) the idea that all human activity is rooted in what he called the *heart* and which denotes a kind of concentration point within our existence where we are known deepest by others and respond to our ultimate concerns.

In the following sections we will discuss first the theory of modal aspects, then the theory of entities or *individuality structures*, followed by the concepts of law and cosmic order, next the idea of the heart and, finally, what Dooyeweerd saw as the fundamental flaw of Western philosophy and science: its absolutization of the theoretical attitude of thought.

Modal Aspects

Dooyeweerd says in an interview that the idea of modal diversity came to him in a flash during a walk in the dunes somewhere around 1921 when he was overwhelmed by the astonishing diversity and the incredible coherence in the way things exist and are functioning (Van Dunné et al. 1977, 37). Everything exists in many different ways—ways that are both distinguishable and interconnected in our ordinary experience of the world. A flower, for example, exists in a spatial, a physical, and a biotic way: it occupies a certain space, it has physical properties (e.g., mass), and it functions as a biotic entity, because it grows, blossoms, and reproduces. A flower may also function in other spheres or aspects—for instance, in the economic or the aesthetic aspect. It then functions as an economic or aesthetic object, respectively. All these different ways of functioning are woven together in a seemingly self-evident and natural way in our everyday experience. We do not even notice the manifold differences.

However, we can become aware of them in certain contexts in which a particular feature stands out, or when we step back and reflect on the differences. For example, a flower seller will be more aware of certain physical properties of plants and flowers, such as their weight, because he has to handle them. Consumers on the other hand may be more interested in how flowers function in the aesthetic and economic aspects. Similarly, a physician will explicitly take notice of specific features of a wound (e.g., color, temperature, size) whereas the patient will be inclined to focus on the pain the lesion causes. Dooyeweerd calls the most general ways of existing (or functioning) *aspects*, or *modal aspects*—other terms he employs for the same notion are *functions*, *modal functions*, and (more technically) *law-spheres*. The term *modal* does not refer to logic (modal logic) but to the Latin term *modus* which

Table 1 Modal aspects and meaning nuclei

Modal aspects	Meaning nucleus of each aspect
Numerical (or quantitative) aspect	Discrete quantity
Spatial aspect	Continuous extension
Kinematic aspect	Uniform movement/flow, constancy
Physical aspect	Energy
Biotic aspect	Life
Psychic (or sensitive) aspect	Feeling, sensitivity
Logical aspect	Analysis
Historical (or cultural-historical) aspect	Formative power/control
Lingual (or sign) aspect	Signification, articulation
Social aspect	Social life
Economic aspect	Frugality
Aesthetic aspect	Allusivity, imaginativity
Jural aspect	Retribution
Moral aspect	Love, sincerity, honesty, integrity
Pistic (or certitudinal/fiduciary) aspect	Trust, confidence, reliability

means “way of existing or functioning.” Dooyeweerd discerns 14 (and later, 15) of these modes of functioning (see Table 1).

Everything functions in a number of *spheres*; not in one sphere at a time, diachronically, but in all spheres synchronically, in an orderly way and in close conjunction. A sphere is not a layer—an ontic cross section, so to say—within an entity. It is a way of functioning or existing, not a part of a substance.

Things function in these spheres in basically two ways; namely, as subject or as object. Flowers exist (or function) within a numerical, a geometrical, a kinematic, a physical, and a biotic sphere. That is, they exist numerically, spatially, physically, and biotically; which means that, in their existing, flowers manifest discreteness (numerical sphere), spatial continuity (geometrical sphere), persistence/constancy (kinematic sphere), qualities such as mass and energy (physical sphere), and generation and tendency to self-maintenance (biotic sphere). In these five spheres, flowers function as *subject*—that is, they manifest these qualities themselves, *actively*. Flowers also function in other spheres as *object*; for instance, as object of scientific analysis (logical sphere) or as object with aesthetic qualities (aesthetic sphere). In all these other spheres flowers function as objects, *passively*, in their interaction with human beings (or animals and plants). Object-functions are, in other words, latent as long as their qualities are not disclosed (or opened up) by other subjects.

It is safe to say that modal aspects refer to kinds of properties rather than properties per se. The term *property* is usually understood as referring to an instantiation of a more general category. When I say, “This car is black,” then black is a property of the car. It is an instantiation in this particular car of the general category of blackness. Analytic philosophers often refer to property instantiations as tropes and to properties as universals. Modes, or modal aspects, refer neither to property instantiations, nor to properties, but to the general categories or families of properties—

more specifically, to kinds of properties. The distinctness of these kinds has something to do with the distinctness, or *sovereignty*, of laws and/or principles, according to Dooyeweerd. More precisely, the distinctness of kinds of properties is a reflection of the irreducible distinctness in the way laws and principles determine and delimit what exists and occurs.

The idea of distinctness picks up a theme from the thought of Abraham Kuyper, the nineteenth-century theologian, philosopher, statesman, and prolific author who probably inspired Dooyeweerd most. Kuyper had developed the idea of *sphere sovereignty* in order to understand how different social spheres can overlap but retain relative independence at the same time. For example, the activities of the church and of the state overlap, but are at the same time *sovereign in their own sphere*, because both obey to their own normative principles. These normative principles are ultimately not man-made but intrinsic to our social existence and “given”—although their specific implementations are, of course, influenced by culture and local circumstances. Dooyeweerd applied this sociological principle of sphere sovereignty to all kinds of laws. The cosmos we inhabit manifests an order with a manifold of laws. Each of these laws belongs to a particular type and these types represent modal spheres.

Dooyeweerd devoted the entire second volume of his magnum opus *A New Critique of Theoretical Thought* (1953–1958) to the analysis of and distinction between these modal aspects. He distinguished 15 modal aspects (see Table 1), each with its own typical character, or meaning. As mentioned earlier, modal aspects are not layers or components but rather modes of existence—they concern the *how* and not the *what*. In the next section we will explore what Dooyeweerd has to say about the *what*—i.e., about entities and their structure.

In his systematic philosophy, the modal analysis precedes and is more fundamental than the analysis of entities. Dooyeweerd is, of course, aware that most scientists are primarily occupied with entities; i.e., with things, part-whole relationships, and with the interactions and relations between particular types of things. He nevertheless maintains that science starts by selecting a particular modal point of view. It is only after having gone through “the gate of modal analysis” that the scientist will study the relationships between and within things. To be sure, this modal point of view does not have to be similar to the modal aspect that qualifies the thing to be studied. Physics, for instance, became a science not by adopting a physical point of view but by applying mathematical principles to physical phenomena.

The Difference Between Modes and Entities

The failure to recognize the relevance of the distinction between modes and entities is the cause of much trouble in the sciences, according to Dooyeweerd. Mental phenomena, for instance, are often conceived as expressions of a mental part (substance, layer, or component) within the organism. In other cases, they are seen as

products that are causally brought about by some mechanism in the brain. This mechanism is usually considered to be non-mental.

Both ways of conceptualizing mental phenomena are problematic in the Dooyeweerdian view. The implicit assumption of the first position is that if there are mental properties and functions, they can only exist if there also exists some mental “stuff” that serves as a bearer of these properties and functions. This view leads inevitably to a form of mind–body dualism, which most scientists and philosophers today find unattractive (as did Dooyeweerd). From a Dooyeweerdian perspective, the argument is based on a non-sequitur—namely, a confusion between the modal and the entitary point of view. Mental properties and functions are not just mental: the phenomena they are referring to are always also biological, social, and moral, to mention but a few of the most obvious other candidate spheres. The term *mental* is in itself slightly confusing because it refers to so many kinds of psychological activities and experiences. But all these psychological kinds of functioning presuppose entities (e.g., activities, processes, actions) that realize them. And these entities also have other qualifications: they involve the working of certain brain circuits (biotic sphere), they presuppose molecular and metabolic processes in these circuits (physical sphere), and they have a developmental history with social, cultural, and moral characteristics.

In short, mental phenomena are entities that function in all modal spheres. To see them as immaterial expressions of an immaterial part within the organism is mixing the modal point of view (their modal qualification) with the entitary point of view; in other words, the psychological *aspect* of the thing (i.e., thought or feeling) is held to be a proof of the existence of a psychic thing (*entity*) in us. Dooyeweerd would, for this reason, be very hesitant to speak of levels or layers as ontic realities. Such layers often do not exist in reality and are, in fact, the product of the ontologizing of a modal point of view. The fact that we can distinguish biological, psychological, social, and moral aspects in our functioning as human beings does not warrant the conclusion that we are composites built up of biological, psychological, social, and moral components.

The implicit assumption of the second and more popular position (i.e., viewing mental phenomena as products of an underlying mechanism or brain process) is also based on the confusion between the modal and the entitary point of view, but in a different way. Here, the point is that mental phenomena are first isolated and then conceptualized as products of the preceding operation of another entity or component in the organism, usually the brain, which is conceived as a biotic entity. Then, the transition from the biotic to the mental becomes problematic, because how can mental phenomena be the output of biotic processes in the brain? The difficulty we have in imagining this is the result of the preceding conceptual separation between production process and product. This separation runs parallel with a tendency to reify both process and product. The picture of the brain as an organ that produces mental phenomena is as old as the sciences of psychology and psychiatry and offers a clear example of this reification tendency. It is problematic because it construes causal relationships between processes that logically and factually imply one another. The phenomena that are produced cannot be separated from the producing

process. Mental processes, for example, are in many respects embodied; their existence can never be seen apart from a context of embodiment and embeddedness. The production metaphor is therefore wrong: it suggests that mental processes and brain processes are separated in time and that they belong, logically and factually, to a different order.

Contemporary adherents of this second approach reject mind–body dualism and therefore have difficulty with the idea of the mental as more or less independent output of the brain. Their rejection of the mental as substance (a rejection with which Dooyeweerd would concur) leads to a reduction of the mental to either an illusion or an epiphenomenon of something else, i.e., processes in the brain. To put it differently: if mental phenomena are not conceived as intrinsically connected with brain processes and if mind–body dualism is not an option, then mental phenomena can only be seen as either illusions (a position which is known as *eliminative physicalism*) or epiphenomena of material processes in the brain (a position known as *non-reductive physicalism*). In the first case, there are no mental phenomena—they only exist in the mind of the perceiver. In the latter case, mental phenomena are only epistemic realities and not ontic—again, they do not really exist.

Dooyeweerd would reject the very presuppositions of this line of reasoning; most notably the idea that modal distinctness should be taken as proof of entitary distinctness. This in turn leads to unjustified substantialization (or reification) of both mental activities and (brain) processes. It is true that neurobiology is an important gateway to the study of the brain. But brain functioning is always embedded in the functioning of the nervous system as a whole, and the nervous system can only function in its interlacements with the body. The body in turn functions in its interlacements with all other aspects of who we are—persons who are interacting with their environment. This relatedness and these interactions are not secondary but constitutive for what it is to be a brain and to function as a brain.

One cautionary remark needs to be added, however, which saves the general point but allows us to qualify this account. In the case of humans—and in fact all living beings—the functioning in some modal aspect might still be the result of the functioning of a part of the entity. Whether or not this is the case is a contingent, empirical matter. It seems relevant and adequate to observe that there are parts in the human body (such as livers, spleens, intestines, and certain metabolic processes) that function relatively independently of other parts. Dysfunctioning of these relatively autonomous parts and processes leads to biological and other symptoms that are more or less immediate expressions of that part's function. Other processes lack such relative independence and are, as it were, absorbed within the functioning of the whole. In the initial phases of collaboration between parts they may retain their relative independence. Later on in the process—for instance, under the influence of certain environmental constraints—this independence may be given up for the benefit of the system as a whole: the whole becomes not only more than its parts, but the parts are also no longer identifiable as parts because they are absorbed within the system. The brain might be a candidate for this absorbing type of part-whole relationships. Whether or not this is the case is an empirical matter, however, if one reasons along Dooyeweerdian lines.

Dooyeweerd on Laws, Order, and Transcendental Ideas

Let us return to the relationship between modal aspects and laws. The distinctness of kinds of properties, we said, is a reflection of the irreducible distinctness in the way laws determine what exists and occurs. What does this mean?

Dooyeweerd is a kind of realist with respect to laws and, consequently, order. He adheres to the transcendental view on laws according to which laws exist as conditions; this means that without laws, the things for which they hold would not exist. For something to be *transcendental* is for it to be a necessary presupposition of something else. This necessity is not only epistemic, as in the Kantian, idealistic version of transcendental philosophy, but also ontic (or cosmic—Dooyeweerd’s own preferred term). Without these transcendental conditions not only logical thinking would be impossible, but also our everyday experience, and even existence itself. The existence of flowers, for instance, requires—that is, necessarily presupposes—laws or lawful principles in the spatial, kinematic, physical, and biotic spheres. In order to do justice to the pretheoretical intuition that the biotic aspect is fundamentally distinct from the spatial, kinematic, and physical aspects of the flower, we need a concept of modal distinctness that does not reduce the distinctions to cultural and/or subjective expressions (as in constructivistic epistemologies). In addition, the concept should reflect the insight that the distinctive features of the respective modal aspects cannot be objectified nor conceptually grasped. In other words, the proper meaning of *being biotic*—that is, of *biotic functioning*—can neither be reduced theoretically to notions derived from another modal aspect, nor restlessly scientifically defined. This meaning transcends the logical conception of it, so to speak.

An analogy with beauty might be helpful here. Beauty as a real-life phenomenon entails more than what is meant with the theoretical, or logical, concept of beauty. What it is for a piece of music or poem to be beautiful cannot be fully scientifically defined in the form of a precise concept of beauty, because scientific concepts can only capture the logically graspable aspects of things. Concepts are logical artifacts; the concept of beauty is a derivative of the original meaning of beauty. What beauty is, is difficult to express, even in ordinary language. Its deeper and original meaning comes to expression in the coherence of the aesthetic aspect with other aspects of reality. Beauty has to be experienced, for instance (psychic aspect)—it emanates as an enigmatic quality of our experience, which is itself based in our bodily existence (biotic aspect). The experience of beauty, in turn, is not a solipsistic event—it can be shared with other people (social aspect). It is undeniably there, and we can approach it in different ways: by undergoing the experience, by practicing the relevant form of art, by studying a piece of art, and by learning from what others say about their experiences. But, in doing all of this, we do not grasp a fixed conceptual structure behind or within the phenomenon itself. Rather, we intuit that there is something special and distinct in the phenomenon of beauty that we can approach by paying attention to the richness of the phenomenon, without ever being able to completely grasp and/or define it.

Let us now, for the sake of the argument, presume that beauty is the essential feature of the aesthetic aspect. Dooyeweerd would then contend that just as the essential feature (or *meaning kernel*, as he would say) of the aesthetic aspect cannot be grasped conceptually, theoretically, or scientifically, so, too, cannot the biotic aspect's essential feature be defined conceptually, theoretically, or scientifically. And something similar holds for all the other aspects: they have essential features that transcend theoretical conceptualization and should be thought of as presupposed (i.e., as always being already there) rather than as results of theoretical reflection. This is what Dooyeweerd has in mind when he speaks about the irreducible nature of the modal aspects. Table 1 provides the entire list of the modal spheres' essential qualities.

So far, we have connected Dooyeweerd's conception of law with his ideas about the modal aspects, especially their logical irreducibility. We can now see why this connection can be made. Rather than being a logical order, the lawful order turned out to be transcendental (i.e., necessarily presupposed). The first qualification of the laws by which the order exists is modal. Laws hold, in other words, first of all by determining *how* things exist (and only later by determining *what* exists). Transcendental conditions are special in the sense that they refer to realities of which we have a pretheoretical intuition but to which we have no immediate epistemic access. Our pretheoretical intuitions can be deepened and explicated in the form of theoretical intuitions. These theoretical intuitions are what Dooyeweerd—and Kant and the neo-Kantians before him—calls *transcendental ideas*; i.e., intuitions without which we cannot have the experience or knowledge we appear to have. Behind this looms a distinction between *concept* and *idea* which stems from the Kantian tradition. Concepts can be grasped by pure—that is, theoretical/scientific—reason; they can be defined accurately. Transcendental ideas cannot be accurately defined; they are a kind of intuitions that give a clue about the diversity (i.e., the irrevocable modal distinctness) of reality.

Before proceeding, we should first clarify that what scientists call a law of nature—or principle, lawful regularity, or lawful pattern—is not the same as the ideas of law and order on which Dooyeweerd is focusing. Scientific laws are interpretations, or approximations, of a lawful order; they are not the order itself. The terms *law* and *order* are therefore, strictly speaking, boundary concepts for theoretical thinking. Scientists and philosophers have to presuppose the existence of a lawful order in order to make sense of the regularities and causally relevant relations they discover in their sciences—relations which appear to manifest a fundamental distinctness in the ways in which things function. The presupposition that such an order exists entitles and enables them to discern the more mundane laws of their respective branches of science, Dooyeweerd suggests. The laws that the sciences discover are thus interpretations, fallible attempts to grasp the order of reality.

Let us now take one final step with respect to this notion of transcendental order. We have strong pretheoretical intuitions about the fundamental diversity of reality—a diversity which has its origin in a cosmic order that transcends our conceptual abilities and of which we have no empirical proof. In a similar fashion Dooyeweerd also speaks of other important (transcendental) features of our

knowledge, experience, and existence: the *coherence*, *unity*, and *origin*, respectively, of the cosmic order we inhabit. The fundamental diversity in our experience of reality is a reflection of the fundamental distinctness of laws and of how they hold.

At the same time, however, there is also a fundamental connectedness between the things in the world and between us and the world. This experience of connectedness is a reflection of what is theoretically expressed with the term *coherence* as transcendental idea. Coherence and diversity belong together: they are two sides of the same coin and indicate the first transcendental idea. The experience of meaning—the fact that things refer to one another, together with the suggestion that their connectedness reflects a deeper wholeness and unity—is the pretheoretical precursor of the second transcendental idea, to wit, the idea of *unity* or *wholeness* (totality) of meaning. This sense of unity and wholeness requires in turn a notion of origin of meaning, according to Dooyeweerd. This is expressed in the third transcendental idea, which is the idea of an *origin* of meaning. Diversity (in conjunction with coherence), unity, and origin are the three most fundamental ideas, or transcendental presuppositions, of our experience of reality—and of reality itself, as Dooyeweerd would add.

Do We Need This Framework?

Do we really need these difficult and unpopular transcendental conceptions of law and of an underlying lawful order? Does Dooyeweerd have arguments for this? Would not a more pragmatic notion of law suffice, such as laws as models for the lawful regularities we encounter in our objects of study, or laws in the sense of the regularities, constants, and definitions scientists are working with in their everyday practices?

This is very much the topic of this book, and different authors will respond differently to this question. We will give an example of a possible response to show how Dooyeweerdian intuitions can be brought into contact with current discussions. This response says that maybe we do not need this florid notion of law in the everyday practice of laboratory research or while digesting large amounts of data, for instance, in genetic or epidemiological research. But as soon as the artificiality of the laboratory and other experimental conditions is left behind, the old and well-known questions return. How does it all fit together? What does this theory say about the object under study in its larger context? Are our simplifying models valid and if so, to what extent? Thus, coherence and wholeness will inevitably, if perhaps sometimes implicitly, be on the table, not only in science itself, but also in its applications. References to these notions emerge when scientists tell their own story of what they have been doing, or when they are educating the public. Pointing out what we know about the brain, the origin of the universe, or our genes, will inevitably bring us to a point where implicit assumptions can no longer be kept implicit.

For Dooyeweerd there are also philosophical reasons for this difficult transcendental route. The argument for cosmic order and for the modal distinctness of laws

is indirect and in fact a philosophical conjecture, as he would say—a conjecture that is defensible given the unattractiveness of some of the alternatives. Dooyeweerd suggests that if we try to account for what we know without presupposing the ideas of order and law, this will sooner or later lead to inconsistency.

More precisely, without the presupposition of a (transcendental) cosmic order, our philosophical position would either become nominalistic or rationalistic. Nominalists traditionally believe that laws only exist in our minds. Rationalists think that the order of reality is intelligible and that laws can be accessed and known by (theoretical) reason. Both positions are unattractive for Dooyeweerd. He rejects nominalism because it removes the point of contact between the sciences and everyday experience. For Dooyeweerd, pretheoretical intuitions are important, not because they are always true, but because they give a clue as to the different forms of distinctness and coherence at the level of the cosmic order—a distinctness and sense of coherence that are lost as soon as the scientific attitude is adopted. From a more practical perspective, nominalism is also unattractive because of its sharp contrast with the commonsense realism of most scientists. Their hypotheses are conjectures about what they think really exists. Thus, nominalism with respect to laws would introduce a contradiction in the heart of the empirical sciences.

Dooyeweerd's rejection of rationalism is based on his objections against classical realism (as espoused by Aristotle and the scholastics). According to classical realism, we can grasp the order of reality with our intellectual faculties—the capabilities of our intellect, in other words, correspond to the intelligibility of reality. Dooyeweerd rejects this position because ultimately it absolutizes theoretical reason or, more precisely, the theoretical attitude of thought. For Dooyeweerd theoretical reasoning is always a derivative of our everyday understanding of the world. What is lost in the theoretical attitude is the “indissoluble interrelation” among the modal aspects which present themselves as completely interwoven within our everyday experience (Dooyeweerd 1953–1958, 1:3). This everyday understanding is of course less precise and more subject to error than scientific knowing, but it is characterized by a holism and sense of diversity that fades away as soon as the scientific attitude is adopted. To express this in yet another way: the experience of coherence and diversity is so fundamental that we cannot go behind it—not by reasoning or experience, not even by a scientific reconstruction of the phenomenological properties of our experience.

We have no doubt that Dooyeweerd's nomenclature will raise questions, if not eyebrows. Dooyeweerd's position seems to thrive on what some would call a certain *mysterianism*; i.e., on pretheoretical intuitions that can be made explicit only partially in the form of transcendental ideas. Let us just say that for the reader with a primary scientific or theological interest it is much more important to understand the idea that something is lost when the scientific attitude is adopted—most fundamentally, our pretheoretical sense of diversity, coherence, and wholeness—than to understand the transcendental framework in which Dooyeweerd captures and expresses these ideas. The discussion about this framework is for specialists, and it has no immediate bearing on the discussion about absolutization and reification.

Nowadays, the scientific image of the world has merged with our pretheoretical understandings in many respects. It is very much in line with Dooyeweerd's philosophy to see this as a challenge—that is, to see it as the inevitable consequence of our culture's differentiation, not as something which is in itself wrong or deplorable. It is important to recognize where scientific images are conflated with pretheoretical understanding, to investigate what this means and implies, and to evaluate such confluations in terms of their benefits and disadvantages.

Dooyeweerd on the Heart

Let us finally turn to Dooyeweerd's other core idea which concerns our functioning as humans, both individually and collectively. It is Dooyeweerd's deep conviction that all human functioning is ultimately rooted in what he calls the "heart." The heart is the concentration point of our existence. The term refers to the idea that humans are driven by fundamental concerns, motivations, commitments, and convictions. These are not only individual psychological realities, but they also have an existential and moral/spiritual core and are typically aimed at what is beyond the horizon of our knowledge and experience. The heart itself is not something that can be studied by empirical means. Rather, it is presupposed and it expresses itself in all human functioning, most clearly and explicitly in a person's worldview.

Dooyeweerd's Christian, neo-Calvinist inspiration is definitely important in these ideas of rootedness in the heart and of striving beyond the horizon of our knowledge and experience. However, Dooyeweerd goes to great lengths to support his claim that the idea of the heart as origin of an existential/religious dynamic refers to a reality that is structurally given, and is not limited to a philosophical translation of insights taken from a specific religious tradition. All human beings have an inclination to transcendence, so to speak, independent of their ethnicity or religion. This inclination is ingrained and structurally given. Philosophy cannot answer the question as to what (or who) the existential dynamic is aimed at. It can only argue that the deepest and most central human commitments are aiming at an ultimate meaning of which the source cannot be grasped or explained or immediately experienced. Dooyeweerd calls this source "origin" or "origin of meaning"; it lies beyond the horizon of experience and reflection.

The difficulty with conceptualizing the notion of the heart is that it cannot be equated with functioning in one of the modal aspects nor identified with a part of our biopsychosocial existence. It is not the same as aesthetic feeling, or moral sensitivity, or religious openness, though all of these may represent what is in our hearts. We could call the functioning of the heart a *dynamic*; a dynamic that is itself not bound to one modal aspect and resonates with a person's character, morality, ethos, and worldview. If the modal aspects are plotted on the y axis, then the activity of the heart could be plotted on the x axis. Followers of Dooyeweerd have described this as a relation between structure and direction. *Structure* refers then to modal

functioning (y axis) and *direction* to the existential, moral, and/or religious dynamic within the person, group, or culture (x axis).

Dooyeweerd on Absolutization

With this in mind, we can easily understand at what point things go wrong in philosophy and the sciences, according to Dooyeweerd—namely, when philosophers or scientists ignore the transcendence of the notion of order and the transcendental nature of the ideas of diversity/coherence, unity, and origin. Ignoring this transcendence inevitably leads to the identification of some aspect of reality with what these transcendental notions stand for. This identification means that something within reality (e.g., elementary particles and the laws they are subjected to) is held to be the ultimate foundation (origin), the most unifying element (unity), and/or ultimate binding principle (coherence) of reality. Dooyeweerd calls such unjustified identification of an aspect of reality with these principles of coherence, unity, and origin *absolutization* (from the Latin *absolvere*, “to loosen” or “to set apart”). A part or aspect is set apart and treated as if it were self-sustaining (as substance), had a meaning by itself, and were the ultimate source (origin) of the world.

These absolutizations are characteristic of what he calls *immanence philosophies*—i.e., philosophies which take one element or aspect of the world as the basic “material” of or most fundamental explanatory principle for all that exists. The isms in the sciences are good examples of such absolutizations: physicalism, biologism, psychologism, and so on. Other examples, less bound to one modal aspect, are related to major themes in cosmology, epistemology, or anthropology: the absolutization of individual freedom, for instance, or the exclusive reliance on reason and scientific thinking, or utopian ideas about the malleability of the social and cultural world.

It is one of the main thrusts of Dooyeweerd’s philosophy to unmask these absolutizations. It is his philosophical bet that the absolutization of an aspect or part of reality always leads to inner contradictions in one’s overall conception of reality. This is because absolutization in itself already distorts reality. Distortions resulting from absolutization will inevitably lead to tensions in one’s overall picture of reality and, therefore, to what Dooyeweerd calls *inner antinomies*. One-sided emphasis on scientific or technological control will, for instance, cause problems in one’s concept of freedom. One-sided emphasis on human freedom is incompatible with the idea that we are in many ways determined by our biology and culture.

Something similar holds for the analysis of the Western culture. Long before Horkheimer and Adorno published their landmark study *Dialectic of the Enlightenment* (1947), Dooyeweerd had already pointed out that there is a fundamental tension between technocratic control and individual freedom—or, between “the ideal of science” and the “ideal of personhood” (i.e., being a free person). This tension, or polarity, is irresolvable without a fundamental critique of the presumed autonomy of scientific reason. Dooyeweerd speaks of an irresolvable dialectic in the

ground motive of our culture. The root of this dialectic is a dogmatic adherence to the idea of autonomy of (scientific) reason. A genuinely critical philosophy will adopt a reflective attitude toward its own biases, including the bias of a one-sided scientific view on reality.

Dooyeweerd engaged in extensive dialogue with his fellow philosophers—neo-Kantians, positivists, phenomenologists, and philosophically minded scientists alike—to show the inner antinomies in their thinking. His most important target was the absolutization of theoretical thought itself, especially in the neo-Kantian tradition. It is the presumed autonomy of theoretical reasoning, he thought, that lay at the heart of the crisis in the philosophy and culture of his days. Philosophers and scientists who accept and proclaim the idea of autonomy of theoretical reason often think that their work is critical, independent, and objective. Dooyeweerd attempts to show that, instead, their work is not critical enough. These thinkers forget that all human activity, theoretical thinking included, is always rooted in a broader conception of reality and, in fact, in life itself. They do not see that knowledge of an abstracted part of reality cannot function as the source of meaning, principle of unity, and explanation of diversity. By implicitly assuming that it can, these scholars inadvertently turn legitimate reduction into illegitimate reductionism.

Overview of the Book

As mentioned in the first section of this chapter, this volume is divided in three parts. Part I is devoted to the concept of creation order as such. Part II connects the notion of creation order with work in the special sciences and, especially, with the notion of emergence. The focus is on mathematics, physics, biology, and psychology/psychiatry. Part III investigates how the idea of creation order is conceptualized in three different theological approaches.

Eleonore Stump begins Part I with a chapter on natural law, metaphysics, and the Creator. After an exposition of the *secularist scientific picture* and Aquinas' metaphysics of natural law, she focuses on the topic of reductionism. Drawing on the work of Dupré and Hendry, she argues that there are molecules that have biotic/chemical properties which cannot be derived from the properties of the molecules' physical constituents. She endorses a form of *substance causation*; i.e., the idea that substances can have causal powers with effects on their constituent parts, in virtue of their form or organization. This idea of wholes endowed with causal capacities is also applicable in other fields, such as developmental neuroscience. One example is *joint attention*, which is the phenomenon that mother and child learn to attune to each other very early in infancy, thereby sharing each other's psychological engagement with the world. In cases such as this, the components or parts may determine *how* wholes function, but *what* the whole does is a function of the causal power had by the whole in virtue of the form or configuration of the whole. Stump closes by arguing that rejecting ontological reductionism as such does not establish the truth of theism and the theistic interpretation of (natural) law. However, reductionism

does not fit well with theism. And if reductionism is false and if our ontology can include all kinds of things that can initiate causal chains, from water molecules to persons, then the motive force driving towards atheism seems considerably diminished.

The next chapter, authored by Dooyeweerd scholar *Danie Strauss*, sketches the background of Herman Dooyeweerd's conception of creation order. This conception is firmly rooted in the neo-Calvinist conception of a God whose existence and laws are beyond created reality and who manifests himself in his words and in creation—in the holding of an incredibly complex meshwork of laws and principles. Dooyeweerd rejects both the substantialization and the functionalization of these laws and principles. Modern science has adopted a functional view on laws: laws are patterns or relations that help us understand how things function; they are the expression of a certain (scientific) way of looking at things, not the expression of how things really are or are meant to be. Functionalism is historically connected with nominalism, in Strauss' historical reconstruction. Strauss sketches the enormous influence of nominalism (and its merger with rationalism) on scientific thinking and the modern worldview. He suggests that even Dooyeweerd has fallen prey to the temptations of nominalism, given his inclination to deny the universality of factual reality and his tendency to conflate the lawfulness of reality with the holding of laws. Strauss maintains that it is crucial to recognize that universality is an ontic reality, and not just a way of looking at things. Strauss does not discuss the subject, but it could be added here that Dooyeweerd would probably disagree with Stump's defense of substance causation. His systematic framework implies that causation can only be founded upon the holding of laws and lawful principles and not upon the existence of substances (wholes) *per se*.

Henk G. Geertsema connects the notion of creation order to its future: a promised new creation at the end of history. *Creation order* does not refer to the laws we discover by scientific research and theoretical models, but first and foremost to the concrete order that we live in, experience, and understand. We become acquainted with this order when we learn to walk, to speak, and to relate to others. Philosophy and science are concerned with certain aspects that we can analyze theoretically, but these aspects are not in themselves the order of creation. They are abstract elements of the full order of creation. The eschatological perspective sheds new light on a number of issues: on the continuity between now and then, between the current and the new creation, on the impossibility of adopting a God's eye point of view, on the importance of hope and faithful expectation, and also on the question as to whether and how a single event—to wit, Christ's death and resurrection—can have an impact with a universal meaning. The new creation is a fulfilled creation, in which all structures will be "structures of answering" within our relationship with God and other creatures. With this Geertsema builds on earlier work in which he depicts our existence as a *responding* existence—as determined by the call to respond to God's promise-command. This basic structure will not change in the new creation.

Part II starts with another chapter by *Danie Strauss*. He claims that Christian philosophy with its non-reductionist ontology has a meaningful contribution to make with respect to mathematics. His discussion focuses on the concept of infinity, especially the distinction between the *successive* (or potential) infinite and the *at once* (or actual) infinite. Key to the notion of the successive infinite is the idea of a

sequence of rational numbers that converge to a certain limit ($1/2$, $2/3$, $3/4$, $4/5$, and so on, converging to 1). This approach to the notion of limit (and infinity) is based on the geometrization of mathematical relations. The at once (or actual) infinite is based on the concept of a purely arithmetical continuum of points. The continuum is seen as an infinite totality of non-space-occupying, purely arithmetical points.

The history of mathematics shows that both approaches run into difficulties. Strauss argues that in order to avoid the one-sidedness of arithmeticism—which overemphasizes number—and geometricism—which overemphasizes spatial continuity—mathematics should acknowledge both the uniqueness of and mutual coherence between number and space. This is possible with the systematic philosophy of Herman Dooyeweerd, which construes the *numerical mode* as determined by distinctness (discreteness) and (order of) succession, and *continuity* as a spatial concept entailing both simultaneity (an order at once) and the notion of wholeness, or totality. The idea of an infinite sequence of numbers points to both succession and to wholeness/simultaneity. It is, in other words, based on a spatial deepening of the primitive numerical meaning of *infinity* (of succession) toward the idea of an infinite totality. Based on these Dooyeweerdian notions, Strauss criticizes attempts to ground the idea of the infinite in Christian theology—i.e., in the infinity (omnipresence, eternal existence) of a God who transgresses our conceptual understanding in every respect. For Strauss, it should be the other way around. Mathematics should not derive its basic concepts from theo-ontological speculations; rather, theology should inform itself about basic concepts within the sciences and then formulate its own boundary concepts. This position is in very sharp contrast to some of the views that will be discussed in the theological chapters in Part III of this volume.

Next, *Marinus Dirk Stafleu* explores how to make sense of the notion of emergence within the context of an (adapted) Dooyeweerdian systematic philosophical framework. He begins by making a distinction between emergence within, emergence of, and emergence from the physical world. The latter type of emergence is, obviously, the most difficult to explain. Stafleu defends the view that laws for the different modal spheres are God-given and preexistent. But this does not imply that the emergence of life out of the physical world can be explained by the presence of the biotic and higher modal spheres. Stafleu develops a view in which analogical anticipations within the physical sphere toward the biotic and higher spheres give rise to—still physical—propensities that under certain very special circumstances may lead to the emergence of entities that also have biotic features. Over the course of history, DNA molecules (physical sphere) began to gain (self-)replicating properties that turned out to become a condition for genetic relationships. On this view, the order of creation is, and remains, the same on the law-side of the created world, in spite of the impressive developments and catastrophes that have taken place during the astrophysical and biological evolution of the universe. Such developments occur at the subject-side of reality, which is the side that is characterized by subject-subject and subject-object relations. By drawing a distinction between a philosophical conception of an order of laws and law-spheres, on the one hand, and a scientific approach to developments at the subject-side of reality, on the other hand, Stafleu can maintain the classical notion of creation order—at least, one particular version

of it—and do justice to developments in the sciences, especially physics and biology. It appears again—as in the previous chapter on mathematics—that the Dooyeweerdian framework offers helpful suggestions for a better understanding of basic concepts in the sciences, and also for the translation of scientific findings to broader audiences.

Arnold E. Sikkema continues this discussion by exploring emergentist claims in the context of physics. This chapter is clearly about emergence *within* a particular field of science. After having pointed out that the notion of emergence is not at all clear in itself, he discusses a variety of examples of emergence within physics: the forming of crystalline structures, the coming into existence of correlated electron systems, the Rayleigh-Bénard convection cells, and others. He outlines how reformational philosophical concepts such as idionomy, encapsis, and anticipation can help make sense of these physical phenomena. Sikkema connects the concept of idionomy to the notions of underivability, unpredictability, and (even) contingency. He associates encapsis with the phenomenon of synchronic emergence, whereas he likens the idea of anticipation to the state of certain molecules which are predisposed, or prepared, to evolve into new, emergent states.

Denis Alexander's contribution shifts the attention toward biology. He discusses two large topics; to wit, *progress* and *purpose*. He describes the long history of evolutionary thinking and its adumbration of the idea of evolution as inherently progressive—an idea that has proven to be persistent and that recurs even in the work of Richard Dawkins. In the light of this history, the idea of evolution as a random, blind, contingent process, with humanity as an utterly unlikely, cosmic accident, is a fairly recent development. Alexander thinks that theology does not commit Christians to any particular theory about progress in evolutionary biology, except in the rather weak sense that God fulfills his intentions and purposes through evolutionary processes. God can bring about these intentions and purposes even in a contingent universe. But what does this mean with respect to purpose? Here the tensions seem more apparent, at first sight. Purpose seems self-evident to the Christian; it is an important element in all mainstream Christian theology. But to the atheist, it is not self-evident at all: without a God, and looking through the window of biology alone, there is nothing that forces the atheist to adopt a narrative of ultimate purpose. So, on the one hand, there is no evolutionary theory that allows us to derive a theology of purpose from it. But, on the other hand, there is also no variant of evolutionary theory that necessitates us to accept the idea of a universe without a plan or purpose.

The discussion seems undecided, at least at the most fundamental level. Alexander nevertheless suggests that our current understanding of biology offers a number of clues that make it likely that there are more law-like patterns, uniform principles, and converging trends in the evolutionary process than are compatible with the idea of a totally random, algorithmic process of natural selection. He mentions seven of these clues which give the impression that evolution occurs in a way that is more organized and constrained than mainstream biology has traditionally suggested. This organization and these constraints even lead to a certain degree of predictability of evolutionary processes. The idea of a highly organized and constrained evolu-

tionary history is consistent with the theological claim that there is a God who has intentions and purposes for the world in general and for us in particular.

Emergence is the main topic of *Jitse M. van der Meer's* extensive chapter. The field under study is mainly biology, especially the emergence of life out of the physical world. Van der Meer deviates considerably from the position that Staffleu develops in his chapter. According to van der Meer, emergence is a real thing—it is, therefore, crucial to conceive of it as a causal process. We should look for the source of causality in the material world and not in a preexisting order of laws and lawful principles. Laws are equated with lawfulness and the lawful functioning of objects and processes. In the course of evolution new structures with their own novel lawfulness emerge bottom-up, as it were. It makes sense to relate the new orderings to philosophical frameworks such as the Dooyeweerdian doctrine of modal aspects with their different kinds of laws. But philosophy should not stand in the way of empirical science by ruling out the emergence of new structures without the help of preexistent idionomic principles. We may speak about lawful structures that emerge, but only *post hoc*, so to say. These structures are neither transcendentally nor religiously foreshadowed (e.g., in an idea of creation order containing the seeds of what will finally emerge) in the empirical world. God created the world, according to Scripture, and it makes sense to speak of divine decrees. But this worldview language should not be mixed with philosophical or scientific language. The term *creation order* may still be used—not in the sense of a pregiven order, but as an order that gradually unfolds during the process of evolution.

There is no place in van der Meer's account for the idea that laws hold. This explains why causality becomes so crucial for the understanding of emergence, and also why the law–subject distinction fades away. Laws in the Dooyeweerdian sense are *abstract objects*, according to van der Meer, and abstract objects have no causal power. Attributing more to these abstract objects than their existence in the scientist's mind leads to essentialism. Dooyeweerd's theory of cosmic time order is therefore a form of essentialism.

Whatever one might think of this position, van der Meer is right in asserting that it is deeply problematic when philosophers—on whatever grounds—deny a priori that new structures (and even species) can emerge from existing ones. True, Dooyeweerd's own interpretation of type laws seems to exclude such emergence. However, the chapters by Staffleu and Glas suggest that one does not need to give up the Dooyeweerdian framework to do justice to emergent phenomena. Van der Meer argues for a broader concept of causality, a new conception of type laws (allowing for causal isolation of parts as a condition for the emergence of new structures), and a rejection of the difference between naïve experience and theory.

Gerrit Glas' chapter continues the discussion of emergence against the background of the sciences of the person—most notably, neuroscience and psychology. Three questions are central in Glas' contribution: (1) Does it make a difference for the sciences of the person to maintain a strong notion of law (*strong* in the sense that laws are considered as preexistent and necessary)? (2) Can the apparent tension between the creation order view and evolutionary accounts of lawfulness and order be diminished by employing the concept of emergence? (3) Can the concept of

emergence be made compatible with a strong concept of law? Glas' answer to the first two questions is yes, and his answer to the third is a conditional yes. He argues that, given the slipperiness of the concept of emergence, it is best to take *emergence* in a primarily heuristic and paradigmatic sense; i.e., as a boundary concept at the background of a broad research program. With this he draws a line between emergentism as a heuristic paradigm and emergentism as an implicit ontology which emphasizes lawfulness as "caused" by bottom-up processes (a position that Glas rejects). Something similar holds for the strong view on laws. This view, too, can best be considered a philosophical working hypothesis that may turn out to need adaptations in the form of auxiliary hypotheses. Especially the necessity claim might need adaptations from a worldview perspective. Nevertheless, Glas defends a position in which the notion of holding is retained and taken in a realist sense—in other words, as belonging to reality. There is lawfulness of and within reality which reflects the holding of an order that is in some way related to the intentions of a Creator. This position maintains the law–subject distinction; it allows emergence, including the emergence of new orderings; and it makes firm distinctions between science, philosophy, and worldview.

The chapter by *Lydia Jaeger* offers a fine commentary on the chapters on emergence, especially Glas' chapter on neuroscience and psychology. It also gives a look behind the screens of theology and philosophy of religion with respect to creation order, providing a smooth transition to the third part of the book, which treats the theology of creation order. Jaeger draws on Dooyeweerdian insights to criticize two types of emergentism that are also discussed in Glas' chapter: a non-reductive physicalist variant (with Jaegwon Kim and Philip Clayton as proponents) and a dynamical systems theory variant (with Francisco Varela, Michel Bitbol, and Evan Thompson as representatives). Her criticism on Kim and Clayton runs parallel with Glas' critique, but she also discusses the religious, especially Buddhist, background of the dynamical systems theory of people such as Varela, Thompson, and Bitbol.

The contrast guiding her investigation is one between emptiness and substance. Jaeger focuses on Thompson's account of dynamic co-emergence. His refusal to identify a base level from which new properties emerge—as in physicalist accounts of emergence—and the general difficulty of identifying a substrate (i.e., the ground from which dynamical co-emergence is emerging) are direct consequences of the fundamental role of the Buddhist notion of emptiness. Everything refers circularly to everything, with an empty hub in the middle, which implies that our thinking, theoretical or otherwise, cannot gain a firm conceptual foothold.

This is different in the creation view, which postulates the existence of a Creator and of products of his hands. A substance view seems most appropriate to account for the relative independence and the reality of these products, on the provision that this substantiality is completed with a notion of personhood, which is guaranteed by the biblical notion of man as image of God. *Personhood* seems a spiritual notion on Jaeger's account, in the sense that it can be seen as an expression of the divine *Logos*, which permeates created reality and serves as life-saving and life-bringing connection with God as origin. Recognizing Dooyeweerd's motives for doing so, Jaeger nevertheless rejects his criticism of the metaphysics of substances and of the

so-called *logos* speculation. To be sure, substances are not things-in-themselves and the *logos* speculation has Platonic and rationalistic features. But these imperfections can be remedied. We are not the first to try this. As an example, consider the balance between nature and personhood, which is so important for anthropology. This balance was already a widely discussed and crucial subject for the church fathers in their painstaking search for the right formulation of the existence of a God whose divine being is one in nature (substance) and, at the same time, consists of three persons—Father, Son, and Holy Spirit (personhood).

The first chapter in Part III by *Nicholas Ansell* offers a biblical-theological evaluation of creation order thinking from the perspective of the wisdom literature in the Old Testament. According to creation order thinking, right living requires our lives to be aligned to the God-given structure of existence. Life is thus conceived of as a *going with*, rather than a *going against*, what some have called “the grain of the cosmos.” This conception is widely believed to be grounded in, and supported by, the wisdom literature of the Old Testament. However, building on the work of Roland Murphy and others, Ansell argues against this view. What Scripture means by *wisdom* is best interpreted not as conformity to a (hidden) normative order, but as a way that consists of the life-giving interplay between God’s blessing and creation’s participation in that blessing. Based on a careful reading of Proverbs, especially chapter 30, Ansell concludes that a creation order reading tends to obscure certain facets of meaning and experience—facets that point to a mystery-affirming appreciation of creation. Proverbs 30:19 asks us, after all, not to turn our gaze to the “fixed order” of the stars (Jer. 31:35), but to the singular, unrepeatable path of an eagle and the subtle and supple way of the serpent. Mystery involves much more than hidden order. By being attuned to the original blessing with which the biblical narrative begins, Ansell concludes, the mystery-affirming appreciation of creation does not lead to an *anti-nomian* eradication of order; rather, it leads to its *ante-nomian* relativization. This is another way of saying that blessing, historically and systematically, precedes order.

Hans Schaeffer strikes a similar note in his contribution on the concept of creation order from a Lutheran perspective. According to Luther, God’s work in creation can be divided in three estates or “hierarchies”: *ecclesia*, *oeconomia*, and *politia*. Church (*ecclesia*) is the primal relationship between human beings as creatures to God the Creator. Economy (*oeconomia*) denotes everything which in current society is differentiated as marriage, family, economy, education, and science. The third is the state (*politia*), which is protecting us from chaos and shapes human life by laws and regulations. These estates or hierarchies do not refer to pre-established fixed orders, but should be seen as God’s address to us by which he upholds (institutes) his relationship to us and to the world. The role of this doctrine of estates is mainly heuristic, pointing at what theologian Bernd Wannewetsch calls “life-forms” or “life-giving forms.” God’s words open spheres of human life in which humans, living in a sinful context, are called to respond to his call. These spheres are the means that God provides for the sanctification of our lives. It should be noted that the description of this call looks very similar to Geertsema’s reinter-

pretation of Dooyeweerd's law-subject relation as a relation between God's promise-command and human responding.

In the second part of the chapter Schaeffer discusses Lutheran criticisms on classical neo-Calvinist approaches to creation and creation order. The argument largely parallels well-known (older) criticisms within reformational philosophical circles. The Reformed view on creation order is seen as depending on the idea of a fixed order; as an exclusively backward-looking instead of redemption-oriented, eschatological doctrine; as leading to essentialism; and as being in support of moral conservatism and the ruling class. The Lutheran perspective is then depicted as more flexible and as leaving more room for hamartiological, redemptive, and eschatological perspectives on human existence. At the end of the chapter Schaeffer mentions some topics for further discussion, such as how the notion of vocation is related to a conceptual framework that distinguishes between normatively distinct spheres of human responding; how Dooyeweerd's transcendental critique can be brought into contact with Lutheran theology; and how the notion of hope can inform discussions about the future of creation order.

In the work of Dietrich Bonhoeffer, we encounter an even more radical critique on creation order theology. *Annette Mosher* describes how Bonhoeffer, already before 1933, began to criticize theologians such as Althaus and Hirsch, who defended a *volk* theology with a vocabulary derived from the doctrine of creation order. It is in the history and spirit of what is called the *volk* (a mixture of ethnicity, nationality, and character, together with a sense of being entitled to a certain historical role) that creation ordinances become manifest, according to these theologians. The human person becomes a person as a result of his/her relation to the *volk*. Bonhoeffer left no room for such *volk* theology outside Christ. Bonhoeffer accepted Luther's two kingdom theology along with the creation order theologians, but gave it a radically different theological interpretation. Community with God exists only through Christ and Christ is present only in his church-community. This is another version of the idea that it is only possible to gain access to the understanding of creation order through the cross and the church.

Creation order theology looks toward the beginning, but Bonhoeffer argues that we can never know the beginning—it is an infinite question that cannot be answered. Trying to find the ordinances of the beginning is looking for the old things of the world instead of the new world that the church finds in Christ. It is enthroning reason in the place of God. Bonhoeffer argues that our focus should be on the reality of Christ in the present, which is in the middle between the past and the future. There is no revelation in history or in nature—only in Christ. These ideas are further elaborated in Bonhoeffer's *Ethics*, where the order of preservation is transformed into a doctrine of four mandates. The mandates are work, marriage, government, and the church. They are not so much spheres of life on their own as they are gifts and duties that should be directed towards Christ. Work is serving and glorifying Christ by participating in the world. Marriage exemplifies the life-bringing union between Christ and the church. The government is given to sustain what exists; not as a final goal and end in itself, but as a way to preserve the functioning of all that is reality in

Christ. True community, finally, is not a nationalistic division, but is found in the church which embraces and envelops all of humanity.

The final chapter by *Josephien van Kessel* is devoted to the Sophiology of Sergei Bulgakov. In the work of this Eastern Orthodox thinker and priest we return to a version of the *logos* speculation discussed in Lydia Jaeger's chapter. *Sophia* is a difficult concept to understand. It refers, of course, to wisdom—God's wisdom—but also to God's love and providence. At the same time, wisdom forms the hidden order of creation. This order is not the expression of divine wisdom, nor is wisdom in the human mind a reflection of the hidden order of creation. The order is *Sophia* and *Sophia* is order—not as a scholastic substance or a cosmic blueprint in God's mind, but as an embodiment of contrasts, as an in-between; between transcendence and immanence, between the divine and the human world, and between the one and the manifold. A Dooyeweerdian thinker would call it a boundary concept, and Bulgakov in fact uses such terms as *boundary* and *border* to indicate *Sophia*'s nature. But *Sophia* also represents the connection and the “between” between immanence and transcendence. This “between” is an antinomy that helps us escape from what Bulgakov calls *immanentism*. *Sophia* is not an abstraction but a reality, a living reality or living being that directs our spiritual attention beyond immanent concerns. As such, *Sophia* is marked by countenance and personhood. It is a kind of hypostasis; not as a separate substance next to God as Father, Son, and Holy Spirit, but as God's nature, beyond time and space, and yet also as the root of the world and of human existence—and therefore fully immanent.

There is a cosmological and a theological approach to *Sophia*. Human knowledge, and especially science, is limited in the sense that it is rationalistically and unilaterally oriented toward this world. Bulgakov's quest for a religious revival aims at reaching deeper—existentially as well as ontologically—than traditional, rationalistic Western philosophies. It is true that Bulgakov is inspired by Hegel's dialectic of stages of consciousness in religion, art, and philosophy. But his ultimate aims are broader and more religious when he describes a hierarchy of possibilities to experience and to express the absolute through successive levels of myth making. Bulgakov's thoughts are difficult to grasp and somewhat remote from neo-Calvinist philosophy, yet there are more than superficial similarities; for instance, between *Sophia* and Dooyeweerd's prism metaphor as an expression of the relation between the supra-temporal origin of meaning and the many temporal manifestations of this origin; and between *Sophia* and the primacy of blessing over rationally understandable order, as described in Ansell's account.

Conclusion

This is not the place to draw firm conclusions. There are, however, a few strands of thought which deserve to be mentioned and which offer hints as to where we are and how the discussion is moving forward.

Within reformational philosophical circles there are divergent interpretations of cosmic order: from classic defenses of the distinction between law and subject (Strauss) to the view that laws are just abstract objects (van der Meer). Nevertheless, the reformational philosophers who contribute to this volume tend to stress the distinction between worldview, philosophy, and science—even more than Dooyeweerd. As a result there is a tendency

- to put less emphasis on the idea of pregiveness and the necessity of cosmic order;
- to highlight the association between order and the trustworthiness, depth, beauty, and wisdom of God and his concern with the work of his hands (Geertsema);
- to locate the concept of creation order in the sphere of worldviews and not (or not primarily) in the sphere of philosophy or science (Geertsema; Glas);
- to create considerably more conceptual distance between scientific formulations of laws of nature, on the one hand, and the philosophical (transcendental) notion of law, on the other hand, and to see the philosophical notion of law primarily as something we need in order to make sense of the notion of the holding of laws in science and in everyday life (Staffleu; Sikkema); and
- to recognize a variety of ways in which laws hold, which leads, among other things, to an appreciation of the importance of dispositional approaches to lawfulness (van der Meer; Jaeger; Glas).

Another strand of thought focuses on the concept of emergence and its possible role in counteracting reductionism. *Creation order* is often seen as an important concept in this context, also by those contributors who do not primarily associate their philosophies with reformational philosophy (Stump; Jaeger). However, there appear to be several notions of emergence (Staffleu; van der Meer; Jaeger) and no consensus about the relation between law, causality, and emergence. A possible way forward may be to think of *emergence* as a heuristic, philosophical boundary concept within the sciences; i.e., as a research program, rather than a panacea against reductionism (Glas).

Alexander's contribution merits special mention in this context, because he does not seem to need the concept of emergence. This is, Alexander suggests, because there are sufficient arguments within biology itself to counter atheism and reductionism. This point is especially interesting in light of a suggestion made earlier in this chapter, namely, that evolutionary theory is based on the assumption that evolutionary—and cosmic—processes are fundamentally contingent. Alexander's account suggests that contingency is an empirical rather than a philosophical presumption, and that there are empirical grounds for thinking that the evolutionary process has a direction.

In the theological chapters one can discern a strong tendency to reject the idea of creation order as a fixed and necessary order, existing from the beginning of the universe. The reasons for this rejection are that

- creation order turns our attention in the wrong direction—i.e., toward the beginning instead of toward the end (Geertsema; Ansell; Schaeffer; Mosher);

- it stresses static order rather than development and dynamism, which should be connected with the theological notions of sin and the need for salvation (Schaeffer; Mosher); and
- it is strongly associated with rationalism, essentialism, moral conservatism, and false (or even idolatrous) ideologies (Ansell).

It should be obvious that the creation order view that most theologians object to is not the view that the majority of reformational philosophers defend. We hear in the theological accounts a strong rejection of rationalistic approaches to creation order and a desire to do justice to the reality and transforming power of God's grace and blessing (Ansell; Van Kessel)—a desire, also, to connect with the very fact of our createdness by connecting with the life and work of Jesus Christ. These desires are obviously legitimate and—probably—not discussed enough in reformational philosophical circles. They indicate the need for further discussion between theologians and philosophers on the intriguing subject of creation order and its future.

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