Dynamic Being

Dynamic Being:

Essays in Process-Relational Ontology

Edited by

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PREFACE

DYNAMICAL AND PROCESS-RELATIONAL ONTOLOGIES

VESSELIN PETROV

One of the most important characteristics of present day ontological research is the growing interest in, and emphasis on, the dynamic aspects of being and/or on the process-relational character of being itself. Among the first investigations in the field of dynamics theory in ontology was the book *Process Theories: Crossdisciplinary Studies in Dynamic Categories*,[1] which was published more than ten years ago in 2004 by Kluwer Academic Publishers. However, it was devoted almost exclusively to the investigation of dynamic categories. Many other important questions still await detailed answers. For example, what is the meaning of the concepts of "dynamics," "dynamicity," "dynamic ontology," etc…? Are they identical to, or similar with, "processes," "process ontology," "process-relational ontology" respectively? Is "process ontology" a type of "dynamic ontology"?

The aim of the present book is to examine these and many other questions, or at least to suggest fruitful approaches in dealing with such questions. At the same time, it outlines some of the recent developments in the field of ontology. The book aims to carry out two main tasks: first, to investigate developments in the theory of dynamic and process-relational ontologies, and second, to investigate developments in the application of these ontologies. The second task is multidisciplinary in character and, as such, the authors of the chapters in this volume are specialists not only in philosophy, but also in other fields of science, for instance, psychology, biology, mathematics, logic, computer science, etc…

The above formulated aim and tasks have determined the structure of this book. It is divided into two parts: Part I: "Dynamic and Process-Relational Ontology—Theory" and Part II: "Dynamic and Process-Relational Ontology—Application." Part I begins with a discussion of some general problems concerning the meaning of the basic concepts of

"dynamicity," "dynamical systems," and the relationship between dynamical systems and process-relational theories. Next, it deals with some general problems pertaining to the principles of process-relational ontology and its development. It then considers some concrete aspects of process-relational ontology (e.g., freedom, creativity, potentiality, ontological memory, and causality), including aspects of its dialogue with other domains of philosophy, such as hermeneutic phenomenology. Later, it investigates some aspects of dynamic being, such as normativity and harmonization. Part I concludes with an investigation of some of the historical aspects of the idea of dynamism.

Part II begins with a consideration of some fruitful applications of process-relational ontology to the scientific fields of psychiatry and evolutionary biology. Then special attention is paid to the application of dynamic and process-relational ontologies to the formal sciences: mathematics, logic, semantics, and computer science. The following is a more detailed review of the contents of the chapters in the book.

Chapter One, "Aristotle's 'Completeness Test' as Heuristics for an Account of Dynamicity" by Johanna Seibt, functions largely as an introductory chapter to the whole book, given that its main task is to present some preliminary considerations for an exploration of the question of what it means for being to be "dynamic" and to suggest how one might formulate an implicit definition of "dynamicity." The author approaches this task from the methodological stance of analytical ontology. Investigations of the nature of dynamic being and the study of "dynamicity" have thus far remained outside the purview of the mainstream debate in analytical ontology. The present essay is one of the first pioneering investigations to do so from the perspective of analytical ontology. According to Seibt, the reason for the neglect of dynamic entities and of the notion of dynamicity is not due to the use of formal languages in the description of ontological domains. Rather, it lies in a combination of sociological and conceptual factors. There are no principled obstacles against analytical process ontology in the sense of a formal theory of dynamicity and dynamic entities. Hence, the aim of the essay is to present some preliminary and heuristic considerations toward a formal account of the notion of dynamicity. Seibt differentiates between metaphysics and ontology, and her investigations in the paper pertain to the ontology of dynamicity, rather than to the metaphysics of dynamicity. She formulates three important subtasks: first, to investigate the question of the definability of dynamicity (the question of the direct definition of dynamicity in analytical ontology); second, to inquire into the question of atemporal dynamicity (or dynamicity independently on temporal

relationships); and third, to deal with the question of primacy of directed dynamicity (sorting out which modes of dynamicity are basic and which are derived).

An ontological account of dynamicity, undertaken in the general methodological paradigm of analytical ontology, aims to reconstruct conceptual content as it is made manifest in inferential relations. The author emphasizes that the recent debate in analytical ontology on existence in time has little to offer an ontology of dynamicity, even where it nominally speaks of "static" entities, of "events," or of "becoming." This debate centers either explicitly or implicitly around John Ellis McTaggart's contrast between four-dimensionalism and presentism. However, Seibt suggests that an ontological account of dynamicity needs to sidestep contemporary uses of the terms "dynamic" and "static" in the mainstream discussion of analytical ontology and to take its bearings from other sources. She chooses the route of locating inferential data by reviewing some discussions of dynamic being in the history of philosophy. She turns specifically to a passage in Aristotle's Metaphysics IX, Chapter Six, which contains important leads for arriving at a general method as well as provides insight into specific inferential constraints. The passage represents the so-called Aristotelian "completeness test" where Aristotle comments on his double distinction, on the one hand, between *dynamis* and *energeia*, and, on the other hand, between *kinesis* and *energeia*. In relation to the background of the restatements of Aristotle's text, Seibt considers its possible heuristic significance for an ontology of dynamic being. For that purpose, she considers the development of some traditional interpretations of Aristotle's text, namely, those carried out by Gilbert Ryle (1949), Zeno Vendler (1957) and Anthony Kenny (1965). She argues that, despite their shortcomings, they also produce some important insights that can assist us in the project of constructing an ontology of dynamic being. In reaction to the difficulties that she raises in respect to this project, the author suggests an alternative interpretation of Aristotle's "completeness test." In contrast to other readings, Seibt argues that Aristotle's text contains a definition, not of occurrence types, but of two modes or forms of dynamicity. First, there is the dynamicity of the "stretched" developmental variety, considered as a "push from here to there"—the mode of dynamicity of "coming about" (*kinesis*). Second, there is "dynamicity" in the form of "going-on" as "self-propagation"—the mode of dynamicity of "self-expression" (*energeia*). There is a curious interdependence that is present in relation to these modes here. Specifically, the second mode of dynamicity, namely, involving a "going on" or "self-expression," is the way in which the first

mode of dynamicity is there. Specifically, "coming about" is there by the "going on" of some *dynamis* to become-F. At the same time, it appears that we can only understand the mode of dynamicity of "self-expression" by contrasting it with "coming about." Here, the questions of what to do with the interdependence between these two modes of dynamicity, and/or of how to solve this "riddle of dynamicity," arise naturally.

Seibt then displays four possible reactions to such claims, all of which are exemplified in the history of metaphysics. One of them is Whitehead's own solution to "the riddle." However, she does not embrace any of these four reactions. Rather, she advances her own fifth option, namely, a standard implicit definition of the "ongoingness" of "dynamicity." The general strategy of her proposal can be summarized by the following claims: (i) dynamicity or dynamic being is "ongoingness by expressing itself"—"to be" is to "go on"; (ii) "self-expression" is reflected, in characteristic structure, in the description of an entity; (iii) for example, if we describe an entity E in terms of a partition that specifies what is "part of being that entity" (i.e., we specify its spatial, function, material, etc…, parts within a single partition using a generic part relation), the fact that E is dynamic will be reflected in the partition in the form of certain distinctive patterns representing "self-expression"; (iv) self-expression is mereologically reflected in strict automerity, which generates self-similar patterns within a partition. The author makes the further suggestion of using a "leveled mereology" instead of classical extensional mereology, in coming to her solution.

In the conclusion of the chapter, Seibt states that the question of whether, in relation to the suggested interpretation, *energeia* is the "dominant" one of the two modes of dynamicity, can remain open. The most important issue, according to her, is the use of Aristotle's text as a foil for a discussion of the most basic concepts in an ontology of dynamic being. Aristotle's text provides us with two very useful methodological pointers: first, it can direct analytical ontologists to a more careful investigation of aspectual inferences as the relevant linguistic data for an ontology of dynamic beings or occurrence types; and second, within a non-standard mereology, we can formulate the self-referential structures that seem to be the hallmark of any attempt of conceptually characterizing dynamicity.

The aim of Chapter Two, "The Difference between Dynamical Systems and Process Theories," by Roberto Poli, is to explain the differences between dynamical systems theory and process theory. It approaches the questions of what dynamics and dynamicity are, and of whether dynamical systems are simply reducible to process theories. It

tackles these issues from quite a different angle as compared with the previous chapter. Poli explains briefly what dynamical systems theory and process theory are. His answers stem from the obvious fact that dynamical systems theory is a theory of a class of formal models. It is scientific theory, while process theory is ontological (metaphysical), i.e., it is a philosophical theory.

Poli outlines two main differences between the two theories. First, according to him, process theories require some type of "glue" to keep the states of the underlying temporal continuum together, and they accept causation as providing such "glue," while classic dynamical systems do not need any "glue" to keep the points of the continuum together. The second main difference concerns time: dynamical systems theories consider time only as *order*, while for process theories *order* is not sufficient unto itself, and they include unidimensionality, the present moment, parallelism, and actuality in their understanding of time. In that sense, dynamical systems theory is more general than process theory and does not necessarily have a process theory as its underlying ontological framework. The chapter considers these differences in more detail and analyzes some of the main concepts belonging to dynamical systems theories and to process theories, such as continuum, time, process, and causation.

Poli considers the category of "process" as a category of real being. Its analysis requires analysis of the categories of "time" and "causation." However, ideal entities are atemporal and are not connected by causal relations. In his analysis of "causation," Poli relies on Nikolai Hartmann's notion that causation provides an explanation for why the series of the states in a process is not just arbitrary, but rather, one state depends on another. Causation has the form of a temporal series. The ordered collection of a series of causal relations is a process. Concerning time, Poli discusses only its universal moments. He stresses the connection of time with becoming: time is both the dimension and the direction of what becomes. Five characterizing features of time are analyzed: (1) unidimensionality (time is not a system of dimensions); (2) order (time as order is only the continuity of time, because time proceeds uniformly over all events); (3) the moment-now (perhaps the most important feature of real time); (4) parallelism (all temporal processes run at the same velocity); and (5) actuality (the feature of the present as it advances in the flow of time; the past and the future are not unreal, they are just not actual). In connection with the notion of continuum, Poli explains some important concepts that are present in Brentano's theory of continua, and especially, the latter's theory of the present as a boundary within a

continuous process. Poli concludes by stressing that in contrast to dynamical systems theory, process theories explicitly require causation as the link that keeps together the states of the underlying temporal continuum, and that dynamical systems theories see time only as order. The perspective on time that is embedded in the latter, as it were, stems from "outside," while process theories add a vision of time from "inside," due to the structural features of the moment-now.

Chapter Three, "Dynamic Aspects of the Development of Process Ontology" by Vesselin Petrov, is a continuation of the previous chapter, because it stems from the contemporary notion of dynamicity as well as from Poli's claim that the conceptual basis of dynamical systems theory is broader than that of process theory. However, Petrov goes further in investigating the principles of theory formation in ontology, and of process ontology in particular. The investigation in this chapter is meta-ontological in character, since its aim is to analyze the dynamic aspects of the development of process ontology as well as to outline some of the basic characteristics and tendencies of this development. There are two main tasks subordinated to that aim: first, to consider and compare the development of some main process ontologies after Whitehead, so as to outline their basic characteristics, and second, to speculate about the future development of process ontologies and the underlying characteristics of those process ontologies.

In carrying out the first task that was mentioned above, the author outlines three kinds of change, or three tendencies respecting the development of ontology: (1) theory revision by way of partial replacement of elements of an existing category system and/or local alterations to a categorical network; (2) radical ontology theory revision by way of wholesale replacement of the existing category system; and (3) the expansion of theory by way of specialization. The first tendency is characterized by three features realized in different ontological systems: (a) increasing the number of categories in ontological systems; (b) decreasing the number of categories in ontological systems; and (c) substitution of a new category for some old one. If (c) is realized concerning some basic category in the ontological system, it could lead to (2) radical ontology theory revision, which is realized (otherwise) by substitution of some main group of categories or even of the whole system of categories. Historical examples are given in the chapter for each occasion—in particular, Whitehead's version of process ontology, Rescher's version of process ontology, Johanna Seibt's General Process Ontology (a version of non-Whiteheadian process ontology), and Justus Buchler's naturalism. In relation to (3) the expansion of theory by way of

specialization above, the development of IT-ontologies is discussed in comparison with philosophical ontologies. A possible tendency in the future development of ontology that is outlined in the chapter will consist in the emergence of new top-level ontologies and especially process ontologies, as well as the emergence of new regional ontologies. This tendency can be realized in a strong or in a weak form. The weak form is exemplified in Andrew Paul Ushenko's works, and one should expect that the strong version of expansion by specialization will be realized in some future process ontological investigations.

With respect to the second task that was mentioned above, the author observes that the current state of development is leaning toward the creation of process ontologies that are more dynamic in character than Whitehead's own process-relational ontology. Petrov argues that one of the main potentialities for the future development of process ontology can be formulated as a claim that in a truly dynamic ontology, such as a process ontology, the basic philosophical categories should themselves be *variable* so that they can express the dynamic nature of reality. One of the first attempts to build an ontological system embedded with "variability" in terms of its categories is present in the work of Joseph Brenner, although this attempt is defective on many fronts. Petrov expresses his hope that we shall arrive at an entirely new form of process-relational ontology that will be very different from Whitehead's own version, and that will be distinct from other contemporary attempts to construct a non-Whiteheadian process ontology. Process-relational ontologies of the future may prove to be a kind of dynamic process ontology, but it is still too early to specify what kind of dynamicity it will express and how it will be expressed.

Finally, the author speculates about two additional potentialities pertaining to the direction that process-relational ontology will take in its future development. The first consists in an ongoing synthesis of regional ontologies into new ones, or into a new higher-level ontology, largely by ignoring the details of the lower-level ontologies. This feature is easily observed in the development of the distinctly scientific ontologies of today. The second important tendency consists in the emergence of complex interrelations, interconnections, and interactions among distinct philosophical process ontologies. The same tendency is obviously evident even today for a number of scientific ontologies, but its full manifestation in philosophical process ontologies is still forthcoming. All of the tendencies that are considered in the chapter are based on the present situation surrounding the development of process ontology. In this sense, they represent the next logical steps in the course of development of

process ontology. According to Petrov, the present day situation surrounding the development of process ontology does not provide us with any grounds for the formulation of other real tendencies than the ones discussed here.

Chapter Four, "Aspects of Dynamic Ontology in Whitehead's *Process and Reality*" by Helmut Maassen, furthers some of the investigations of dynamic ontology that were carried out in the previous chapters, carrying them into a concrete area of philosophy. Maassen analyzes some aspects of dynamic ontology in Whitehead's main philosophical work, *Process and Reality*.[2] The author discusses some of the various components or aspects of dynamicity that are present in Whitehead's metaphysics. He reminds the reader that the fundamental ontological unit in Whitehead's metaphysics is the "actual entity," which is a center of activity as it prehends. Whitehead's introduction of his ontological principle is important because it explains the implication for each process of prehension in terms of its emotional value. Whitehead's metaphysics is based in experience; it has both an empirical and a rational side. That said, if we emphasize the descriptive / revisionary division of metaphysics, Whitehead's metaphysics can be characterized as being of the revisionary type, although he attempts to overcome these distinctions in his own form of speculative philosophy. Maassen agrees with James Bradley who has characterized Whitehead's metaphysics as being both a transcendentalism and speculative realism. Maassen describes the basic components of Whitehead's metaphysics that attach to its dynamic character—first of all, the ontological status of actual entities. He emphasizes Whitehead's view that an actual entity never *is*, but is always in the process of becoming. He explains what a "feeling" is in Whitehead's metaphysics, as the doctrine of "feeling" is a central doctrine that is at the root of Whitehead's descriptions of the process of becoming of an actual entity. A feeling cannot be abstracted from the actual entity entertaining it, because the actual entity is the "subject" of the feeling. However, the term "subject" can be misleading, and it is for this reason that Whitehead introduces the term "superject." Whitehead's notion of "subject-superject" points to the purpose of the process originating the feeling. The author explains the significance of the concept of "subject-superject" in connection with some of Whitehead's other important concepts, such as "creativity," "novelty," "many," and "togetherness." Near the end of the chapter, Maassen points out some of the implications that Whitehead's process metaphysics has in relation to practical philosophy. In this regard, he points to Whitehead's critique of Hobbes' concept of the state, given that for Hobbes the laws of human behavior correspond to the laws of Newtonian physics. However,

Whitehead advocated for a new cosmological scheme, in which the dominant scientific materialism is replaced with a modified organic or holistic theory of reality. Maassen considers what follows for ethics from this organismic perspective.

The focus of Chapter Five, "Freedom, Creativity, and Potentiality in Whitehead's Metaphysics" by Ella Csikós, is on the concept of freedom analyzed from the point of view of Whitehead's metaphysics. Freedom is closely related to determinacy—these terms presupposing one another indirectly, and excluding each other directly. Ontologically, freedom is a characteristic of each and every actual entity. Csikós considers the following question: on what ground can the category of freedom be related to subvital entities? Her answer is that, according to Whitehead, the mediating concept here is *decision*. She argues that the becoming of each entity is externally underdetermined, because there is a tension in the external determination, which calls for a decision. The external underdetemination calls for an internal "overdetermination," and this, in itself, is the freedom of becoming which is, in turn, representative of the field of *decision*. Freedom appears in the practice of self-causation, and it can take place even at subvital levels of organization given the affirmation of the whole being of the becoming entity. The author emphasizes that the notion that *decision*, as an overdetermining activity, adds a new element into the process of concrescence which cannot be deduced from the past, the given, or the external. Whitehead has established a link between freedom and creativity. However, Csikós thinks that freedom is a derivative concept from the more basic concept of creativity. The actual entity reproduces its own freedom in each act of self-realization, and, in that sense, freedom becomes endless through creativity.

That said, there is a problem regarding the means by which Whitehead can differentiate between degrees of freedom that are qualitatively different within the family of free entities, especially between freedom in a moral context and freedom in the usual mode of existence. Whitehead himself does not provide a conceptual basis for the differentiation of degrees of freedom at the same level as a categorical means for describing the common generalities that have been elaborated. Csikós suggests the following solution: since the concept of freedom has been derived from creativity, change would be needed within this latter, original concept, in order to be able to differentiate between levels of freedom. There is a conceptual resource for interpreting the process as involving a creative advance in nature and history. In this wider, but weaker, sense of creativity, everything that becomes will be a novelty, because it realizes some possibilities for the first time. Creativity, in this primary, but weak,

sense will be identified with the realization of potentialities not previously achieved. She thinks that this interpretation should be complemented by a stronger notion of creativity, which exceeds the realization of potentialities. So, if we assert the qualitative difference between actualizing a new reality and creating a new potentiality, we may differentiate between various forms of freedom. In this way, the type of freedom that is characteristic of human beings is no longer of the same type that is attached to actual entities. Csikós answers the question of whether, through distinguishing between the various degrees of freedom, a kind of dualism appears in Whitehead's metaphysics, by suggesting that some sort of dualism must be present in a metaphysical system that endeavors to give a comprehensive description of the universe. For her, the conjecture of a more specialized, more dynamic, and stronger, concept of freedom does not undermine Whitehead's cosmological scheme.

Chapter Six, "Dynamic Being and Ontological Memory" by Maria-Teresa Teixeira, investigates the close connection between dynamic being and ontological memory. The author defends the thesis that ontological memory seems to be entangled with dynamic being in such a way that they are one and the same thing. Ontological memory is a correlate of dynamic being, for the dynamics of being both constitutes ontological memory and represents its origin. First, Maria-Teresa Teixeira traces ontological memory back to Plato's philosophy, and considers its expression in Plato's *Symposium* and *Timaeus*. Next, she points that Augustine's memory is also ontological and that his analysis of memory is basically an approach to dynamic being. Precisely, some of Augustine's works display that a dynamic ontological movement is also to be found in music, because the rhythm of music is not only its stable measurement, but also a dynamic development.

Nowadays, memory is ontological in process philosophy as well, because it is constitutive of being—the ontological nature of memory consists in its dynamic character. Memory is neither a faculty of the mind nor is it a collection of archaeological layers. Rather, it manifests itself as a productive activity that preserves itself. Process thinkers have envisaged an active memory enabling a novel dynamics of being. Bergson's "indestructible memory" and Whitehead's "immortal past" illustrate this concept of a dynamic, ontological memory. The author then considers Bergson's views of memory in more detail. She points out that contemporary neuroscience still cannot account for memory taken as the synthesis that makes up individuality, because memory persists and constitutes itself as time passes by. However, Bergson's past is in a sense contemporaneous with the present due to the durational nature of

ontological memory. In general, process philosophy preserves the past as the present comes into existence. Dynamic being grows in time, but duration itself can be found nowhere. The durational character of being is patent in Bergson's ontological memory. Temporality is revealed not only by the present that keeps appearing and developing, but also by the past that remains active and helps to constitute being.

In respect to Whitehead's views, Teixeira points out that the latter's notion of the "immortal past" is ever present in every actual occasion that becomes. His notion of a "prehension" involves an act of seizure of the past, appropriation, and synthesis. Whitehead's actual entities perish, but they do not vanish. They cease to exist subjectively, but persist in their objective immortality. In perishing, we become immortal and memory becomes constitutive of each and every being. This is the true ontological memory. Every actual entity already holds its future within itself, because time carries with it the category of incompleteness. Anticipation is also a constitutive element of an actual entity that can be attributed to memory. The author agrees with the thesis that Whitehead's epochal theory of time also allows for a certain indeterminacy in respect to the past. She concludes with the observation that the very process of becoming is not a linear process; it is heterogeneous and ingenious. Its diversity unites in an indivisible, dynamic unison that reminds us of musical harmony. Music can be regarded as a metaphor for becoming and also for epochal time. Both Bergson and Whitehead have emphasized the importance of music in describing metaphysical reality.

Chapter Seven, "The Perception of Causality in Light of Process Ontology" by Piotr Leśniak, deals with a particular aspect of process philosophy, namely, the perception of causality from a Whiteheadian point of view. Human perception has an important emotional dimension. The aim of the chapter is to apply the Whiteheadian ontological framework in order to explicate the nature of the perception of causality. According to the author, the Whiteheadian scheme allows us to determine the nature of the "emotional background" of perception without falling into the traps of subjectivism, representationalism, or substantialism. He first sketches the history of the problem of causality in the works of Hume and Kant, both of whom believe in "causal nihilism," namely, that there is no perception of causality. In contrast, Whitehead accepts a mode of perception, which he calls "presentational immediacy." Later in the twentieth century, Albert Michotte carried out a series of experiments that justified the claim that there is a kind of "causal impression" that is neither the result of repetition nor has its origin in intellectual judgment. Other contemporary philosophers speculate that we perceive the simple "dynamics" of reality

in a direct manner. Michotte suggests that there is sensory source of our causal beliefs and he calls this sensory factor of cognition, "causal impression," which makes the understanding of causal statements possible. According to Whitehead, causal impressions are primitive elements of sense perception that are used by the sensory system in order to build an environmentally adequate immediate presentation of flowing nature. The author considers, in some detail, Whitehead's complex view of perception, which differs from the other contemporary theories of perception. Whitehead aims at a theory that explains perception by way of a single, coherent system, and strives to avoid the fallacies of conceptualism, sensationalism, and substantialism. He argues against the Humean interpretation and suggests—twenty years prior to Michotte—that through simple psychological experimentation, we could ask subjects who blinked after a flash to explain what they had experienced. Leśniak attempts in the chapter to make use of the observation that perception in the mode of presentational immediacy, which dominates our adult conscious life, would be experienced as disembodied and unreal if they were isolated from the background of causal feelings. He stresses that there is no ontological gap in process philosophy between simple causal feelings and the activity of the peripheral nervous system where these feelings have their origin. Feelings of causal efficacy are the most immediate forms of experience. By way of them, we get in touch with reality. Leśniak concludes by suggesting that the fallacy of representationalism consists in the belief that symbolism requires some language-like semantics.

Chapter Eight, "Processualizing Hermeneutic Ontology and The Problem of the Indeterminacy of Interpretation" by Dimitri Ginev, deals with an interesting possibility concerning a promising dialogue between the schools of process thought and hermeneutic phenomenology in respect to the ontology of interpretation. The aim of the author is to demonstrate that adherents of hermeneutic phenomenology might profit significantly from different kinds of process studies. In order to achieve that aim he first tries to answer the question of whether the alleged redundance of contextual dependence in the ontological interpretation implies a deficit of epistemological normativity. Ginev considers the dilemma of whether we should accept epistemological skepticism as the ultimate philosophical position with regard to the nature of interpretation, or whether we ought to recast hermeneutics as a special field of (weakly normative, post-empiricist) epistemology. He observes that supporters of the standard position are unable to transcend this dilemma and he argues that the background of practices in an interpretative process is specifiable as a hermeneutic fore-structure of generating knowledge claims and cognitive

structures. The ontological approach to interpretation is capable of revealing some potential for dealing successfully with the aspects of normative indeterminacy. An ontological approach to interpretation that is grounded upon a theory of double hermeneutics allows one to hold the view of strong (ontological) holism, while avoiding skepticism about the epistemological specifiability of interpretative practices. The author argues further for the possibility of an epistemologically specifiable ontological hermeneutics. He proceeds in three steps. First, he examines the constitution of the existential analytic of meaning as a mediator between the methodological and the ontological theory of interpretation. Second, he elaborates on the concept of the hermeneutic fore-structure of science's interpretative practices as a specification of the existential analytic's nexus of understanding-interpretation. And third, he argues against the subordination of hermeneutics to epistemology. Finally, the author provides a sketch of a hermeneutic theory of scientific research. He argues that his version of hermeneutic ontology manages to overcome the indeterminacy of interpretation by using an approach to the contextualization of the understanding / interpretation nexus that bears significant similarities with tendencies in process studies.

Chapter Nine, "Emerged Content and Dynamic Normativity" by Yujian Zheng, is devoted to an aspect of dynamic being, namely to the distinctive forms of dynamic normativity. The author begins with discussion of a typical example that is provided in philosophical discourses in relation to representational content, in order to argue that determinate proper functions of any intentional property or trait only emerge, for any organism *qua* subject, when we move up the evolutionary ladder to arrive at the rational capacities for sophisticated inferences. The historical dimensions of teleo-semantic functions as well as their forward-looking dimensions share the following important methodological feature: they both apply diachronic holism, namely, "retrospective interpretation," to gradually emerged higher-level properties or evolved kinds. Next, the author defines "natural norms" as those norms that are unrepresented by the individual whose performance fulfills a function. He makes a distinction between "the first-order representations" and "the second-order representations," emphasizing that theoretical explanation is a type of second-order representation. There is a contrast between a relatively pure epistemological relation (for explanations in the domain of physics) and an epistemological-*cum*-ontological relation (for explanations in the domain where teleology functions). One main aspect of the "ontological" part of this relation is a kind of evolutionary becoming of some rationally partial or incomplete form of being into some rationally full-blown—or

normatively complete—form. The author distinguishes between prescriptive normativity, interpretive normativity, and constitutive normativity, and provides his motivations for these distinctions, paying special attention to the justification for constitutive normativity. He points out that the validity of external reasons does not depend on any particular individual's understanding or awareness of them. Hence, they are "objective" in the epistemological sense. The status of "external reasons," even for the evolutionary ancestors of human beings, was something not only for them as outside observers, but also for themselves, as insiders, engaged or "internalized" by whatever means possible and at whatever possible level. Our role has to be both that of outsiders and insiders in the grand natural "game," simultaneously. Constitutive normativity not only allows for degrees, but presupposes the gradual, upgrading character of evolutionary forces that underpins the formation of intentionality. The author proposes to employ John Searle's formula for constitutive rules, as well as four modified versions of it, in order to illustrate the dynamics of constitutive normativity. He considers four evolutionary scenarios oriented toward a full-blown intentionality and which embody the dynamics of constitutive normativity.

Chapter Ten, "Being as a Process of Harmonization: A Chinese View of Dynamic Being" by Chenyang Li Nanyang, explores another aspect of dynamic being—that of harmonization—as it has been developed in the *Book of Changes* and he outlines the differences between the Eastern and Western philosophical conceptions of the notion of harmony. The author argues that the Confucian notion of harmony goes beyond the narrow understanding of harmony that is affirmed by contemporary Western thinkers. He considers, in brief, the key characteristics of Confucian harmony and he attempts to provide a sketch of the philosophy of harmony in Confucian philosophy. One of the main differences between the Confucian notion and the Ancient Greek notion of harmony is that, unlike the Pythagorean conception of harmony, Confucian harmony can only be defined in qualitative terms; it cannot be measured quantitatively or precisely. Furthermore, the Confucian notion of harmony is a metaphysical one, namely, it purports to describe the dynamic reality of the world. In this regard, the Confucian notion of reality is very different from the Platonic notion of reality and also from the Pythagorean notion of reality. While there are points of connection between the Confucian notion of harmony and the Whiteheadian notion of harmony, such a comparison is not among the tasks of the author.

Chapter Eleven, "La Mettrie and the Autodynamism of Matter" by François Beets, is devoted to the analysis of a concrete period in the

historical development of the idea of dynamism in philosophy, namely, to the notion of the autodynamism of matter as expressed by the eighteenth century French philosopher, Julien Offray de la Mettrie. La Mettrie is a well known representative of the apogee in mechanistic philosophy that was influential for a long period of time, until it was criticized by Whitehead and the other process philosophers in the twentieth century. However, it is important to know that La Mettrie posits the existence of an autodynamism in matter that explains the emergence of life and thought. According to his initial views, matter has three essential properties: space, motion, and feelings, where memory, imagination, and the passions are the product of a mechanical process. He supports the notion that the gap between animals and human beings in terms of their mentality is just a question of degree. The human soul is nothing but the principle of movement and the brain is its material part. For La Mettrie, thought itself is a property of matter. That said, in a later period of his life, La Mettrie's writings become, to some extent, self-contradictory, because he sometimes supports an organic holism, but then returns again to the materialist scheme which deems that man is plant-like being. In one of his works, he criticizes his own work and claims that animals have souls and that their souls are just like ours, namely, distinct from matter. Finally, he insists, from a mechanistic materialist point of view, that there is an auto-organization of matter and that purely material nature succeeded in making a machine that thinks. That said, at the end of his life, he was skeptical about the possibility of building a machine that can talk and he defended a kind of spiritualism, coming to a firm condemnation of materialism. Beets thinks that La Mettrie's shifts from materialism to organicism to spiritualism and back again constitute a provocative game, given that La Mettrie once said that the notion that nature and living organisms are machines "is the most beautiful joke in the world."

Chapter Twelve, "Descartes and the Problem of the Passions" by Carlos Garcia Mancilla, is devoted to a criticism of Descartes' dualism of mind and body. Although this criticism stems from a perspective that seems greatly to be one that is in the vein of dynamic and process-relational philosophy, this is not mentioned explicitly in the text. The author focuses on the role of passions in the so-called "ontological distance" between subject and individual in Descartes' philosophy. He analyzes the dichotomy between thought and the world, and he considers the origin of the division between subject and object in the works of Descartes. Mancilla calls the contradictions of thought in Descartes' meditations as "symptoms" of something deeper, claiming that these symptoms have a symbolic character. Modern philosophers have labeled

the passions as something obscure and largely out of the reach of the power of thought to understand. This obscurity that is ascribed to the passions by Descartes is the first symptom of what the author calls the "ontological distance." Descartes' philosophy is the first place in modern thought where one can begin to reveal the symptom and to reveal Descartes' inability to understand the union between mind and body. The author analyzes the question of why the epistemological foundation is taken by Descartes as being equivalent to the ontological foundation. The idea of simplicity in Descartes comes from mathematics. For him, philosophical truth must be as clear as that of mathematics. However, this stance is in conflict with the fact that many philosophical ideas that are generated are deduced. The imagination is central to the possibility of coming up with hypotheses. It opens up a first abyss between the world and the subject. The imagination neither discovers what is true nor what is false. The criterion of clarity in arriving at the truth, which Descartes' method demands, can only be achieved with simplicity. Reason, due to its finitude, cannot attend to numerous things at once without confusion. Due to the assumption that the perceptions are similar to the things, experience has the idea of truth as adequacy, but such an idea is incongruous, in that Descartes conflates the external world with the internal one. The notion of truth as adequacy falls as a victim of Descartes' own method. The author criticizes Descartes for attempting to give a basis to knowledge before knowing. After all, how could it be possible to appreciate external things by attending to one's own thoughts? Descartes pursues the truth as if he did not have a body and as if there was no real world or other things. Another defect of Descartes' method is that, according to him, we attempt to be more a spectator than an actor in the world. Descartes' doubt leads to a complete abandonment of life and action. Nothing within the method indicates what to do or how action should be directed. The Cartesian method separates thought from action in proposing the subject. Thus, there can neither be a subject of action nor pure practical reason. However, the ontological distance is not clear in Descartes' reflections. Sometimes he uses the "I" as an individual, and sometimes he refers to the subject in a substantive manner. His method is only personal; it is not a method that everyone should follow.

Next, Mancilla considers the problem of freedom in Descartes, given that Descartes is one of the few modern philosophers who affirm strongly the existence of freedom. Freedom in Descartes has four phases and ways of being attached to the subject or the individual. From freedom in an absolute sense to the determinism belonging to the principle of cause and effect, the problem of freedom is linked to the fundamental distinction

between the mind and the body. Freedom, for Descartes, exhibits the symptom of ontological distance that has been proposed. Every feeling is internal to the subject and unrelated to external objects; feelings are the way in which the subject perceives. Feelings and sensations only appear in the union between mind and body; the intellect is completely passive to these qualities. Every feeling, sensation, pleasure, or pain has a specific referent in the body-machine. The basic property of extension, namely, movement, provides the possibility of explaining it. Pleasure and pain are not properly passions of the soul. As sensations, these feelings are passive because they are beyond the possibility of the will to change. As the body machine and pure thought are considered by Descartes to be separate from one another, the resulting third substance, namely, the union of mind and body—the individual—is not simple and cannot be deduced. For Descartes the only thing that is characteristic of this substance is the passions. With Descartes, the "I" of thought is different from the "I" who owns a body, simply because thought is not individual, and the body necessarily is. He considers the passions initially by way of the ontological distance, as if they were strange and not our own. The difference between feelings as mere sensations and passions becomes quite obscure in Descartes' philosophy. A radical separation between life and philosophy appears: the existence of the passions leads us to know that there is a union between mind and body, while the method itself leads to the affirmation that this union cannot be understood. Life happens in this union where the individual appears, so the Cartesian philosophy affirms that it cannot understand life.

Finally, the author considers the concepts of good and evil in Descartes' philosophy, because they have important place in it. According to Descartes, morality is the highest science and it can be understood as the possibility of choosing between good and evil. The fundamental impulse here is passion. Descartes proposes that the passions make imprints on the soul in order to maintain its attention on certain things. To attend to something is to keep it inside the boundaries of consciousness and to have power over it. So, the passions are a tool for the power of consciousness. But there is a paradox. For Descartes, on the one hand, the good involves the control of the passions, but on the other hand, it involves the absolute governance by reason over one's actions in life. There are two ways of understanding good and evil in Descartes' philosophy depending on which point of view we take: either that of the compound body or that of the soul alone. In conclusion, the author tries to answer the question of why Descartes was unable to achieve a definitive morality, and he considers several possibilities as answers to that question.

Mancilla argues that every ethical idea that is expressed by Descartes in his treatises and letters can be assimilated to a provisional morality. This definitiveness cannot occur because of the itinerary of the method and due to the fact that the first achieved truths do not allow it. In fact, Descartes' method does not require an ethics. Morality was a need of Descartes himself, as an individual, and not of pure thought. There is no room for a scientific morality, because in contrast to Descartes' method, it is time to act and not to think, namely, to be an agent rather than a spectator of oneself.

Chapter Thirteen, "Reformed Subjectivism and Psychosis" by Michel Weber, occupies the position of first chapter in Part II of the book. It is devoted to an application of Whitehead's process philosophy, namely, to the application of Whitehead's reformed subjectivism in the field of psychiatry. In particular, it considers psychosis from the point of view of Whitehead's reformed subjectivism. The author reminds the readers that Whitehead argues for a reformed subjectivism in order to anchor his ontology in direct experience without supporting classical anthropocentric claims. In the history of philosophy, the unreformed subjectivism has involved the acceptance of the substance-quality ontology with its assumption of vacuous actualities, which Whitehead finds unacceptable. He is convinced that pure experience and genesis are the keys to the postmodern cosmology. Accordingly, the acceptance of the subjectivist principle should lead philosophers to invent new categories, and not to continue to work with the old ones. The reformed subjectivist principle, namely, "that the whole universe consists of elements disclosed in the analysis of experiences of subjects,"[2] in fact, stands for the unity or togetherness of the three principles: relativity, process, and the ontological principle.

Weber then considers psychosis. He emphasizes that subjectivity from the Whiteheadian point of view involves concrescence, not consciousness, and he considers the question of what would happen if the experiential standpoint is psychotic. The question is addressed in respect to the particular, but fundamental, form of psychosis, namely, in respect to schizophrenia. Weber discusses the historical mental constructs of schizophrenia that have been instrumental since the mid-nineteenth century, the most important of which is the claim that there are two forms of self-consciousness—the awareness of oneself by oneself and the awareness of oneself as an object of someone else's observation. These two forms grant two fundamental "schizo-schisms": the one splitting the mind itself, dividing it between a true self and false self, and the other splitting the body and the mind, thereby creating the "unembodied self."

The schizophrenic subject is endowed with (or suffers from) a reformed (corrupted) atunement that is supposed to alleviate his or her lack of security but actually aggravates things altogether. This syntonic loss offers a direct entry into Whitehead's ontology because of its proximity with the concept of unison of becoming. From a Whiteheadian perspective, subjectivity—not consciousness—is key. The tight ontological web that Whitehead depicts is not one of pure emotion but of pure experience. Subjective forms do indeed matter, but not as much as the vectorial character of experience itself. So, psychotherapy would gain in efficacy without increasing the risk of decompensation, if it decided to interact holistically with patients instead of systematically pushing the intellectualization of their emotions. Conversely, the contrast between mental and physical "poles" also needs to be reconsidered, as Whitehead sometimes speaks of concrescence as the "togetherness" of a "physical pole" and a "mental pole." This conceptual move fits the descriptions of the schizophrenic defences.

In the conclusion of the chapter, Weber considers the question of what the characteristics of a schizophrenigenic culture are. From a Whiteheadian perspective, the question can be formulated rather in the form: what sort of initial subjective aim fosters disharmony instead of unison? In other words, how can individuation and solidarity both prevented? In his answer, Weber points to the role of ideology of neo-liberalism. While culture *per se* nurtures both individuation and solidarity and while old-fashioned capitalism imposes conformism and atomicity, schizophrenigenic culture—the world piloted by neo-liberal finance—destroys the very possibility of a shared world with the help of double binds.

Chapter Fourteen, "On Ethotype, Epigenetics, and Organic Selection: Process-Relational Ontology and Behavior in Evolutionary Biology" by Adam C. Scarfe, is devoted to the application of process-relational ontology to evolutionary biology and psychology. The chapter advances the concept of *ethotype* as the behavioral analogue of the terms "genotype" and "phenotype." The author relies on various novel developments in evolutionary biology, such as contemporary investigations of the ideas of James Mark Baldwin and Conrad Hal Waddington, which offer perspectives that stand in sharp contrast to the modern neo-Darwinian interpretation of the notions of "evolution" and of "species." Scarfe argues that in order to describe the evolutionary dynamism that is characteristic of organisms in an adequate way, the term "ethotype," pointing to the overall behavioral character of organisms, ought to be construed in light of process-relational ontology rather than by way of static substance

ontology. Scarfe provides several examples of the evolutionary importance of the behavior of organisms in the struggle for existence. He argues that the term *ethotype* is an important one for biological inquiry and he points out that it is far more accurate to consider the ethotypes of the organisms being studied as dynamic, plastic, relational, and/or in process, than to understand them statically. In this regard, Whitehead's process-relational and "organismic" ontology provides ideal contextual and conceptual supports for such a view of the organism. The notion of an ethotype, construed in light of process-relational metaphysics and/or of other dynamic ontologies, would further contribute to the understanding that organisms are not merely passive objects upon which natural selection happens to act, but that they are also subjects and/or agents of selection.

The author criticizes the mainstream gene-centered and mechanistic neo-Darwinian standpoint in biology that minimizes the role of behavior in biology. He first argues that in the mainstream of biology, behavior is not typically seen as a determinant of what constitutes a species or of how organisms are classified. Second, that there is a long track record for evolutionary theorists to conflate behavior and morphology, and/or to compartmentalize behavior as merely being one aspect of the (putatively genetically-determined) phenotype upon which natural selection happens to act. In fact, mentality and behavior are not merely to be seen as fixed aspects of a phenotype. Rather, they depend on the lived life of the organism. And third, the author criticizes the entrenched habit of focusing on the genotypes and the phenotypes of organisms as being the fundamental units of selection and change, which draws attention away from behavioral selection and change. He argues that in light of recent developments in evolutionary biology, for example, the resurgence of the theory of organic selection as well as epigenetics research, there are good reasons to include a more adequate focus on behavior, and/or behavioral selection and change in coming to a more comprehensive picture of evolution. That is why he traces some alternative routes of causality that evolution may take, pointing to the notion that behavior is, in many cases, an initiating cause of evolutionary processes. Scarfe explains that recent discoveries in epigenetics open the door to the notion that there are alternative routes of causality in evolutionary processes leading not only from genotype to phenotype and ethotype, but also from phenotype to genotype and ethotype, and from ethotype to the genotype and phenotype, all of course involving natural selection. In this regard, James Baldwin's theory of organic selection, also known as "the Baldwin effect," demonstrates that from the Baldwinian standpoint, it is clear that changes in an organism's behavior can give rise to morphological or phenotypic

variations. Scarfe suggests that a more comprehensive and accurate picture of evolution, beyond the neo-Darwinist mainstream, would take into account each of these routes of causality and would involve the notion that behavior is one of the main spokes of the spinning evolutionary wheel. In conclusion, the author touches upon some of the epistemological and ethical ramifications of a renewed emphasis on the role of behavior in evolutionary processes. He provides a brief sketch of the evolutionary ethic of "critical pan-selectionism" that he has developed in other publications.

Chapter Fifteen, "A Whiteheadian-Type Theory of Space and Time" by Dimiter Vakarelov, is an application of Whitehead's theory of space and time to the modern field of mathematics that is named "dynamic mereotopology." In other words, it is an attempt at providing a mathematical formalization of Whitehead's theory of space and time, working with some of the new trends emerging in mathematics—specifically, dynamic mereotopology. Since the essay is addressed mainly to philosophers and to other non-mathematicians, the author presents the mathematical propositions without the proofs, so that he can focus on explaining the mathematical ideas to readers in a simplified manner. He first reminds the reader of Whitehead's own program to develop a new, point-free, and relational theory of space and time. The essence of the Whiteheadian program is that the theory of time should not be separated from the theory of space, but rather these terms should be integrated. Corresponding with Whitehead's attempts to overcome "the fallacy of simple location" in *Science and the Modern World* (1925), this integrated theory is "point-free," in the sense that in its mathematical formulation—in opposition to the old Euclidean approach—neither space-points nor time-moments should be taken as primitives. In contrast, they should be definable by the other primitives in the theory. Whitehead's ideas in this regard are developed most completely in Part IV of *Process and Reality*, but Whitehead himself did not provide all of the details in a strictly mathematical manner. Two primitive notions belong to the foundation of Whitehead's notion of spacetime—the notion of a *region* and a relation between regions called a *connection* (alternatively called a *contact* in the contemporary region-based theory of space). Whitehead is widely accepted as the founder of contemporary mereotopology (the subfield of the so-called point-free topology), which is an extension of mereology with contact relations and also comprises an extension of Boolean algebra to the so-called contact algebras. The author of the present chapter is one of first mathematicians to have introduced and investigated these contact algebras.

Vakarelov observes that, unfortunately, while Whitehead set out a

program detailing how to build a mathematical theory of space, he did not describe an analogous program for his integrated theory of space and time. That is why the aim of the chapter is to present an initial step toward extending the region-based theory of space, considered as an integrated point-free theory of space and time. The contribution of the author is to introduce a dynamic contact algebra. This means that, according to Vakarelov, the so-called dynamic mereotopology is equivalent to dynamic contact algebras, which are, in turn, equivalent to the integrated point-free theory of space and time. The main results of the chapter consist in obtaining several possible abstract definitions of dynamic mereotopology in the form of dynamic contact algebras, and in providing a demonstration of how one can extract and reproduce the corresponding point-based spacetime structure from these abstract definitions.

The author first gives a brief exposé on mereotopology considered statically. He presents some facts about mereology and mereotopology that are referred to in the formulation of the main results in this chapter. Both mereology and mereotopology are generally considered to be static, which indicates that these theories study things that are not changing. Vakarelov describes a "contact algebra" as a certain extension of the vocabulary of Boolean algebras with one binary relation called a "contact" and as satisfying some simple conditions. He presents two types of contact algebra construction: (1) discrete, relational construction and (2) non-discrete, topological construction, which presents a Whiteheadian-type contact between regions. His main contribution here is a presentation of very simple definitions of the notion of a "point" (more simple than Whitehead's own definition). Next, Vakarelov introduces a concrete dynamic model of space with explicit use of the notion of "moments of time." That model represents regions as changing in time; that is why they are called "dynamic regions." The author provides an abstract point-free characterization of standard dynamic contact algebras and accomplishes the tasks of finding suitable relations between dynamic regions, which are then to find their basis in the abstract definition, and to identify which relations contain enough information in order to extract from them the definitions of space points and time-moments. He finds a set of relations between dynamic regions, which yields enough rich time structure and has a "before-after" relation that satisfies some properties. The main result in the chapter is the provision of a representation theorem for dynamic contact algebras, which shows that, starting from a given dynamic contact algebra, one can define in it a standard dynamic contact algebra and an isomorphic embedding from the first to the second. This construction shows how one can define, in an abstract dynamic contact algebra, time-

moments with the corresponding time structure, and the coordinate contact algebras, which determine its topological space structure and the corresponding space-points. Finally, the author discusses some limitations and questions concerning the philosophical nature of this model of space.

In conclusion, Vakarelov emphasizes that the chapter involves an attempt to present an integrated theory of space and time in the Whiteheadian vein, showing that the structure of space and time can be characterized in a point-free way by considering as primitives neither space points nor moments of time. The formal equivalent is the notion of a dynamic contact algebra with the primitive notion, dynamic regions, and three primitive spatio-temporal relations between dynamic regions—space contact, time contact, and precedence. The chapter also contains an Appendix with preliminary information about logical notations, sets, topology, and Boolean algebras.

Chapter Sixteen, "Identity, Ontology, and Flux: Process, Matter, and the Problem of Mass Nouns" by Henry Laycock, is devoted to an application of process thinking to semantics. Laycock argues that the basic forms of thought and ways of talking of stuff or matter are not compatible with references to *this* or *that*. The author begins by displaying the two different visions of the place of matter in ancient philosophy—that of Aristotle, which involves the discrete substance or *this-something*, and that of Plato, which echoes the thought of Heraclitus with its accent on the ceaseless struggle among opposites. Laycock interprets Plato's *Timaeus* dialogue as having been inspired by the process philosophy of Heraclitus. He stresses that Plato is right to say that there is something in our experience which is sufficiently elusive, and that, if approached in Aristotelian terms, it will be impossible to grasp.

Laycock provides some examples of non-referential, existential claims, and he considers the question of what metaphysical category they should belong to. He observes that the ancient elements are kinds of stuff or matter, and that words for stuff or matter belong within the family of so-called *mass nouns*. The important questions here are: how are words for stuff or matter to be understood? And what is it for stuff or matter to exist? The author thinks that such words are not well understood and he argues that there is no place for words for stuff in a Fregean-style logic of quantification. Considered semantically as either singular or plural, the syntax of mass nouns would seem substantially anomalous. That said, when rightly understood, the syntax of these nouns does not appear to be anomalous. Mass nouns are opposed to *count nouns*, which means that however mass nouns are defined, these nouns fall within the class of nouns which are to be considered "non-count." The author displays the orthogonal