

Theory and History of Ontology by Raul Corazzon | e-mail: rc@ontology.co

Jerzy Perzanowski: Modal Logics, Ontology and Ontologies

INTRODUCTION

An overview of Perzanowski's thought can be found in the *Preface* by Janusz Sytnik-Czetwertynsk to the volume *Art of Philosophy. A Selection of Jerzy Perzanowski's Works*, Frankfurt: Ontos Verlag 2011, pp. 15-21.

"Jerzy Perzanowski's publications concerns mainly the problems of metaphysics and logic. His numerous unpublished works forms an important part of his total output, and actions are taken to arrange, edit and publish these works." (*ibid.*, p. 11.)

"1. Philosophy, taken from the point of view of its problems and methods is the collection of distinct philosophical disciplines. In fact metaphilosophical analysis leads to rather troublesome questions: Are philosophical disciplines methodologically and/or essentially related and connected? Are particular philosophical disciplines scientific? And, if the answer is not definite, to what extent is this so? Do philosophic disciplines form a uniform and organized (at least in its depth) system?

The most important factor in the characterization of any scientific discipline is its problematics. Hence, there are as many philosophical disciplines as there are different and autonomous families of philosophic problems.

Certainly, two philosophical disciplines are particularly distinguished: logic - for methodological reasons and ontology - for essential ones. Instead of considering the initial question in its full complexity, let us go to its kernel - ontology itself.

1. Philosophy, taken from the point of view of its problems and methods, is the collection of distinct philosophical disciplines. In fact, metaphilosophical analysis leads to rather troublesome questions: Are philosophical disciplines methodologically and/or essentially related and connected? Are particular philosophical disciplines scientific? And, if the answer is not definite, to what extent is this so? Do philosophical disciplines form a uniform and organized (at least in its depth) system? The most important factor in the characterization of any scientific discipline is its problematics. Hence, there are as many philosophical disciplines as there are different and autonomous families of philosophical problems. Certainly, two philosophical disciplines are particularly distinguished: logic - for methodological reasons and ontology - for essential ones. Instead of considering the initial question in its full complexity, let's go to its kernel - ontology itself.

Ontology and its parts.

2. Ontology is the theory of what there is, the theory of being. She considers the full ontological universe, all items that are possibles, describing and classifying them and searching for the principles of the universe, principles of taking together the plurality of ontic objects, particular beings, into one - the Being.

Thus, two questions govern ontological investigations: what is possible and why? The second question, concerning the being's principles, may be strengthened to the deepest - last in the logical order - question: how that which is given, or rather what there is, is possible? The question above

principles of being, i.e., general laws of nature, plus the question: what makes possible what there is and renders impossible what there isn't? Because of its matter and problematics ontology is the most general discursive discipline. It is the general theory of possibility. By the nature of its questions it is also very modal.

3. Ontology has two sides: descriptive - phenomenological, and theoretical - formal. Hence, it is divided into three parts: onto-ontics (in brief: ontics), ontomethodology and ontologic.

4. Ontics is devoted to the selection of ontological problems and notions, their differentiation, classification and analysis. Doing ontics we construe the conceptual net of a given ontological theory, i.e. its categories. It is also one of the tasks of ontics to state ontological hypotheses, based on the previous analysis of concepts.

Ontics, being a part of ontology, is itself complex. Its further description depends on the general idea of ontology, on accepted classification of ontological concepts. For example, Ingarden has distinguished three parts of ontology: the material ontics, the formal ontics and the existential one. Notice that his ontology is, in our terms, ontics!

5. Ontomethodology concerns ways of doing ontology, methods and types of ontological constructions as well as principles of choice between ontological statements and theories. Examples of such ontomethodic principles are: the principle of non-contradiction, the principle of sufficient reason, and Ockham's razor.

Indication and discussion of the appropriate principles is necessary for sure for any critique of ontological theories, particularly the critique of the logical means used in ontology.

6. Ontologic is a logic of the ontic realm. It is an investigation of ontological connections, concerning particularly logical relations between pieces of ontic information. Also, it is a theory of the fundament of ontic relations.

Ontologic considers the organization of the ontological universe, trying to describe its mechanism. It describes the complexity of the Being, looking for its laws and base - the Logos.

7. Ontics is a purely descriptive and analytical discipline, ontologic is speculative and formal. They are, however, closely connected and interrelated disciplines, affecting one another. The product of ontics is a description, usually complex, of the ontological universe, whereas ontologic supplies different theories of this universe.

Certainly, at present ontic considerations are more common. In ontology we have many descriptions and claims, but not as many theories.

Among Polish ontologists, for instance, Ingarden may be regarded as typical ontics reasoner, while Leśniewski should be treated as a typical ontologician." (pp. 23-25)

(...)

"Comparison and conclusion.

42. We listed and commented on 18 variants of ontology, what certain doesn't exhaust the full spectrum of ontologies. On the other hand, the number of reasonably differentiated types of ontologies is undoubtedly smaller.

The classification of ontologies into types has certainly not to be arbitrary. It should both follow ontologies' goals and consider their contents.

We considered previously two such classifications:

First, following opposite descriptions of synthesis mechanism, into

STATIC vs. DYNAMIC ontologies;

and the second, according to three main planes of being, into

BEING vs. THOUGHT vs. LANGUAGE ontologies.

In addition, at least three more natural, self-explaining classifications should also be mentioned:

The third, according to the nature of ontologies' objects, into MODAL vs. NON-MODAL ontologies.

It is easy to see that the proper ontologies of being are modal.

The fourth, taking into account the way of doing ontology, into DESCRIPTIVIST vs. CONSTRUCTIVIST ontologies.

They either try to describe or try to construct the ontological universe.

Surely, the golden mean is the best. Particularly, ontologies of being should be - in proper proportion - both of this and that kind.

And, the fifth, regarding the role of the language in ontology: message vs medium, into LINGUISTIC vs. EXTRALINGUISTIC ontologies.

Bringing a given ontology into one type we decide, in fact, to what extent the language, including the language of ontology itself, should be taken into account. Moderation is welcome. Certainly, the language is an important but not alone component of the world.

43. Plurality of ontologies is not without a reason.

Namely, we are interested in different aspects of being. Its full picture shows itself, however, only through comparison." (pp. 39-40)

From: Jerzy Perzanowski, "Ontologies and Ontologies", in: *Logic Counts*, edited by Ewa Zarnecka-Bialy, Dordrecht: Kluwer 1990, pp. 23-42.

"Another string of investigations – which will be analyzed in closer details in 2.3 – involves quantification theory. Logical and linguistic theories of quantifiers try to solve the problem of intentional objects by quantifying over non-existing individuals (allowing, therefore, for empty singular terms), or by skipping the classical presupposition of a non-empty domain (allowing for empty general terms). In that sense, free logics and other quantification theories can and have to be conceived as contributions to formal ontology (...).

The other dominating area of formal ontology, besides the one about intentional objects, is that of complex or compound beings of all kinds. We have already mentioned set theory and mereology, but at least starting with Russell's facts and Davidson's events there is a growing awareness of the fact that several different philosophical entities can be formed from (or built out of, or defined based on) sentences. The discrimination of these entities provides us not only with a rich, but controlled ontology. It further yields a better understanding of what the objects of intensional logic are: What is it that we believe, what is necessary or possible, what can be promised or forbidden (...)

Again, it was a Polish logician, Jerzy Perzanowski, who first suggested the name "ontologic" for this area of research (see his foreword to Scheffler and Urchs (eds.) - *Ontologic. Essays in Formal Ontology* - Volume 2 of *Logic and Logical philosophy*, Torun: Copernicus University Press 1994). Perzanowski's "The Way of Truth" in Poli and Simons (eds.), *Formal Ontology* 1996 is an example of that kind of investigation. In the framework of what he calls qualitative ontology he starts from the standard Parmenidean principle of identity: Being is and nonbeing is not. He defines five conjugate notions of a being (understood as a subject of qualities). Perzanowski's aim is to prove theorems concerning these notions. For that purpose he needs some appropriate formalism. The axiomatics of "Primitive Theory of Being" is a first, but useful, approximation. He considerably improves the expressive power of this theory by assuming two additional abstract concepts of being: as a collection of all beings and as the unity or idea of all beings. By means of classical logic he thus achieves a substantial contribution to the ancient controversy between Plato and Parmenides concerning being and nonbeing: Beings are; Non beings are not; The being is; The nonbeing is; Being is; and Nonbeing is." (pp. 13-14)

From: Jan Faye, Uwe Scheffler and Max Urchs (eds.), *Things, Facts and Events*, Amsterdam: Rodopi 2000.

SOME DEFINITIONS BY JERZY PERZANOWSKI

" **Ontologic** , a part of ontology devoted to the systematic development of formal ontological theories.

0. The general question of Ontology, Leibnizian in spirit, is: *How what is possible is possible?*, whereas the general question of Metaphysics is: *How what is real, or exists, is possible?* Clearly, Metaphysics, by definition, is a particular Ontology.

1. *Ontology*, in its most general and traditional version, is the theory of what there is, the theory of being. It considers the full ontological universe, including all items that are possible.

Two basic questions govern ontological investigation: what is possible and why? Or in a more general and deep way: how that which is possible, is possible?

Because of its questions ontology is the most general discursive discipline. As a matter of fact, it is the general theory of possibility. From other points of view, it is the general theory of relations, the general theory of things and properties or the theory of situations, events and processes.

2. Ontology is divided into three parts: ontics, ontomethodology and ontologic.

Ontics is devoted to the selection of ontological problems and notions, their differentiation, classification and analysis; to construction of the conceptual net of a given ontological theory and to statement of reasonable ontological hypotheses.

Ontomethodology concerns ways of doing ontology, their principles as well as methods and types of ontological constructions.

3. Ontologic is a logic of the ontic realm. It considers the organization of the ontological universe, trying to describe its mechanism.

Ontologic is a discipline of investigation of ontological connections, in particular logical relations between ontic statements.

4. Ontologic is therefore a discipline of logical philosophy. It is made after its receipt: Take an interesting (and real) ontological problem and try to answer it theoretically, i.e., by means of a theory.

To this end, we start with a conceptual analysis (which belongs to ontics), determining relevant primitive concepts and clarifying them enough to find reasonable axioms, which next are subject to logical deduction and appropriate semantical investigation. The method is sound if some theorems answer, or at least illuminate, the starting problem.

Ontologic is ontology done in this way, i.e., ontology produced by answering *ontological* question by means *logical* methods and procedures. In short, ontologic is ontology *modulo* logic: ontologic = ontology / logic."

From: *Ontologika* (a the text published in: www.filozofia.org.pl, but no more available)

EXCERPTS FROM HIS PUBLICATIONS: ONTOLOGICAL MODALITIES

"Alethic modalities are modifiers of semantical and logical components of judgements. Their classification obviously depends on the ontology and semantics that is presupposed. Some modalities are theoretical – useful for reasoning; some are practical or pragmatic – useful for action. Taking the first, at least four kinds of alethic theoretical modalities should be distinguished:

1. *A priori*, concerning what can be thought, used to delineate the realm of reason. Examples are *thinkable, understandable, reasonable, controvertible*, etc.
2. Logical, used for collection and comparison: *possible, necessary, contingent*, etc.
3. Metaphysical, concerning facts, what is real or actual: *actual, factual, to be a fact, to be true, making true, making actual*, etc.
4. Ontological, useful for describing the general and basic conditions for some families of objects or complexes. They concern the possibility of what there is, or what is possible; hence they are used for delineation of the most general field we can deal with – the realm of all possibilities – the ontological space. Examples are: *possibility, necessity, contingency, and exclusion taken in the sense of a condition; compossibility, coexistence, and eminent existence* in the sense of Leibniz, *(formal) possibility* in the sense of Ludwig Wittgenstein's *Tractatus*; *combinable, synthetizable and analysable; making possible, making impossible, being ontologically neutral*; and several common philosophical modalities *de re*: *by necessity, essentially, by its very nature*, etc.

The above classification has a clear counterpart in grammar: some modalities, mostly logical but also *a priori* and metaphysical ones, are adjective-like, some – chiefly ontological modalities – are noun-like. On the other hand, the logical modalities are quantifier-like modifiers (what is nowadays clarified by relational semantics).

There is a widely shared temptation to reduce some modalities to other ones, particularly ontological to logical modalities (and *a fortiori* noun- to adjective-modalities). Moreover, where such reduction is difficult or counterintuitive, it is usual to ignore the unmanageable cases.

According to the kind of modalities one prefers, we have several types of modal reductionism: modal apriorism, factualism, etc. The most popular is modal logicism which claims that any alethic modality can and ought to be treated as a logical modality. The extreme version of this position – modal extensionalism (cf. Quine 1953) is the conjunction of two theses: first, that any alethic modality is reducible to logical modality(ies); and second, that any essential use of logical modalities is eliminable, formally expressed as a claim in favour of the eliminability of *de re* modalities by modalities *de dicto*. Extensionalism not only reduces modalities; it also substitutes set-theoretical ontology for any intensional ontology.

Ontological modalities are the key to any non-reductionistic ontology. The most august family thereof is that of Leibniz: *compossibility, compatibility, coexistence, and eminent existence*. Leibniz himself was fully aware of the role they play in ontology, warning against the "confusion of possibles for compossibles" (*Philosophical Papers and Letters*, ed. L. E. Loemker, 1969, p. 661).

A very manageable family of ontological modalities consists of: *making possible* (MP), *making impossible* (MI), *being ontologically neutral* (ON), which are introduced to formalize the fundamental ontological connections: attraction, repulsion, and indifference.

They are useful especially for the development of the combination ontology dealing, *inter alia*, with relations *simpler than* or *being in* and *combinable from* (cf. Perzanowski 1989). In addition, they enable us to express the Leibnizian modalities mentioned above.

There are two complementary approaches to the theoretical treatment of these modalities: the axiomatic and the semantic. From the semantic point of view, based on the description of the ontological space, MP is used to express formal conditions of synthesis.

Let $o(x)$ denote the collection of all objects synthetizable from the object x , i.e. objects which can be obtained from the objects connected with x (in the most natural case – from the substance of x), the relation *simpler than* or *being in*. The basic idea concerning making possible can now be expressed by:

$$\text{MP}(x, Y) \leftrightarrow y \in \sigma(x);$$

x makes possible y iff y is synthetizable from x .

The outlined family of ontological modalities enables us to define most of the notions used in ontology. In particular, using MP we can define:

$$\text{Cons}(x) := \text{MP}(x, x);$$

x is ontologically *coherent (consistent)* iff x makes itself possible.

$$\text{C}(x, y) := \text{MP}(x, y) \ \& \ \text{MP}(y, x);$$

x and y are *compossible* iff each of them makes possible the other.

$$\text{E}(x, y) := \exists z \ \text{MP}(z, x);$$

x *exists eminently* in y iff there is something in y which makes x possible.

$$\text{R}(x, y) := \forall z \ \text{MP}(z, y);$$

y is (ontologically) *alternative* to x iff everything in x makes y possible.

The first three notions were used by Leibniz, the last encodes the alternativity relation of the canonical models of relational semantics (cf. Chellas 1980). Using the chosen modalities we can therefore define relational semantics for modal logic, providing it with a solid ontological foundation.

Note that the relation R closely connects with Leibniz's notion of eminent existence:

$$\text{R}(x, y) \rightarrow \text{E}(y, x)$$

y is alternative to x implies that y eminently exists in x .

The axiomatic approach opens a rich field of research. Most of the axioms answer the basic questions of ontology. For example: Does making possible preserve ontological coherence?

A priori we have three positive answers, each of which yields a suitable axiom of preservation:

$$(CR) \ \text{MP}(x, y) \ \& \ \text{Cons}(x) \rightarrow \text{Cons}(y)$$

(CL) $MP(x,y) \ \& \ Cons(y) \rightarrow Cons(x)$

(C) $MP(x,y) \rightarrow (Cons(x) \leftrightarrow Cons(y))$

Is making possible -monotonic? This yields, several axioms of (left/right) mono-tonicity, among others:

$MP(\uparrow) : MP(x,y) \ \& \ x \ z \rightarrow MP(z,y)$

$MP(\downarrow) : MP(x,y) \ \& \ z \ y \rightarrow MP(x,z),$

and so on.

Is the ontological universe uniform? I.e., does it include only coherent objects? Only compossible objects?

Again, positive answers to such questions yield the following axioms:

(Ucons) $\forall x \ Cons(x)$

(UC) $\forall x,y \ C(x,y)$

What interconnections hold between basic modalities?

Again, this yields a range of different axioms, for example:

The axiom of ontological trichotomy:

(OT) $\forall x,y \ (MP(x,y) \vee MI(x,y) \vee ON(x,y))$

The axiom of full modalization:

(FM) $\forall x,y \ ON(x,y)$

The contrary axiom of ontological extensionality:

(OE) $\forall x, y \text{ ON}(x, y)$

The axiom of ontological excluded middle, i.e., the ontological consistency axiom:

(OC) $\forall x, y (\text{MP}(x, y) \leftrightarrow \text{MI}(x, y))$.

By taking appropriate families of axioms a wide range of different ontological theories may be defined.

Finally, notice that the above picture, following Leibniz, is chiefly based on the positive ontological modality making possible (MP). If instead we prefer the negative modality making impossible (MI) this would yield a Hegelian path in ontology." (pp. 560-562)

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From: "Modalities, ontological", in: Hans Burkhardt and Barry Smith (eds.), *Handbook of Metaphysics and Ontology*, München: Philosophia Verlag 1991.

PARMENIDES: THE WAY OF TRUTH

"1. Introduction

1.1 The Parmenidean 'way of truth' concerns what there is and what there is not: *estin te kai os ouk esti me einai*. (1) It concerns the basic ontological items: beings and nonbeings, as well as (the) being and (the) nonbeing. As we have learned from Parmenides, Zeno and Plato, (2) the way of Parmenides is the way of difficult truth, the way of metaphysical paradox.

1.2 Quite often the principal truth of Parmenides is formulated as the *ontological principle of identity: being is and nonbeing is not*. Usually this principle is considered tautologous (3) or even trivial.

I disagree. Triviality presupposes clarity. The principle, however, is neither clear nor evident. Also it is not obvious.

Is it true?

1.3 Both 'being' and 'is' are immediate derivatives of the verb 'be'. The verb itself has several variants. Can all these derivatives and variants be presented in a uniform way? Is, for example, 'Being is' a more adequate expression of the thought of Parmenides than 'Whatever is, is'? Next, to which items does the Parmenidean statement refer: to particular beings - like me, you, a ship, this pencil; or to their totality - the being; or to their unity - Being? Should Parmenides' statement be understood as 'the being is and the nonbeing is not', or rather as 'a being is and a nonbeing is not',

i.e., 'any being is and no nonbeing is' or 'beings are and nonbeings are not'?

1.4 The problem was pointed out and discussed by Plato in *Sophist* as the crux of his refutation of the sophistic claim that nothing is false.

Parmenides' spokesman, the Eleatic Stranger, is arguing there for Plato's conclusion that 'nonbeing has an assured existence and a nature of its own', recalling at the same time the warning of Parmenides: 'For never shall this thought prevail, that non-beings are, but keep your mind from this path of inquiry'. (4)

1.5 The answer to Plato's problem clearly depends on an explication of the four notions involved: *being*, *nonbeing*, *is* and *is not*. From a metalogical point of view it is also determined by the related logics: the logic of our reasoning and an appropriate logic of being.

1.6 Hereafter, the ontological notions are explained according to the qualitative approach to the notion of being: *a being is a subject of some qualities the being is the totality of all beings; Being is the unity of all beings*.

These quite ancient but yet obscure formulas are crucial for traditional ontology and they therefore deserve clarification.

Such a clarification requires an appropriate theory of qualities, as well as suitable theory of ontological connection connecting qualities with subjects. It is the latter, above all, which will be outlined in the present study.

1.7 Clarification comes, inter alia, through formalization. Formalization requires logic. In what follows I rely exclusively on classical logic. To be more exact, standard classical logic is used as the logic of reasoning, whereas a suitable applied version of classical logic will serve as our logic of being.

1.8 In what follows a very general theory of ontological connection is provided.

In spite of its generality this theory enables us, as we shall see, to reconsider the classical ontological claims of Parmenides and to refute an anti-ontological claim that the notion of being is syncategorematic.

Also certain ontological theorems will be proved, including: Being is an Nonbeing is (sic!). *A being is, whereas a nonbeing is not*. Also: *Whatever is, is* - which is shown to be equivalent to *Whatever is not, is not*.

1.9 The paper is organized as follows: I start with general remarks concerning ontology and different approaches to the notion of being. Next, several classical questions of traditional ontology are discussed. After making our problems clear, I will introduce a formalism enabling us to study them in the full generality. Finally, the results of the paper are discussed in a manner introducing perspectives for a subsequent theory of qualities." pp. 62-63.

Notes

(1) Cf. Diels 1906, Parmenides B2.3. Notice a rather subtle problem connected with the translation of this claim (see Bodnar 1988b). Inter alia, the following translations have been offered: Diels 1906: "dass [das Seiende] ist und dass es unmöglich nicht sein kann", Bormann 1971: "dass [das Seiende] ist und das Nicht-Seiende ist nicht", Kirk and Raven 1957: "that it is and that it cannot not-be", Burnet 1957: "It is, and... it is impossible for it not to be", Taran 1965: "it is and to not be is not", Mannheim [translator] in Heidegger 1961: "it is, and... nonbeing is impossible".

(2) For Parmenides and Zeno cf. Kirk and Raven 1957, for Plato cf. *Parmenides* and particularly the *Sophist* in Plato 1961.

(3) Cf. Tatarkiewicz 1958.

(4) Cf. *Sophist*, 258 b-d.

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