

Theory and History of Ontology

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Ontology: Its Role in Modern Philosophy

Introduction: A Working Definition

Ontology is the theory of objects and their ties. It provides criteria for distinguishing different types of objects (concrete and abstract, existent and nonexistent, real and ideal, independent and dependent) and their ties (relations, dependencies and predication).

We can distinguish: a) *formal*, b) *descriptive* and c) *formalized* ontologies.

a) *Formal ontology* was introduced by Edmund Husserl in his *Logical Investigations* (1): according to Husserl, its object is the study of the genera of being, the leading regional concepts, i.e., the categories; its true method is the eidetic reduction coupled with the method of categorical intuition. The phenomenological ontology is divided into two: (I) Formal, and (II) Regional, or Material, Ontologies.

The former investigates the problem of truth on three basic levels: (a) Formal Apophantics, or formal logic of judgments, where the a priori conditions for the possibility of the doxic certainty of reason are to be sought, along with (b) the synthetic forms for the possibility of the axiological, and (c) "practical" truths. In other words it is divided into formal logic, formal axiology, and formal praxis.

In contemporary philosophy, formal ontology has been developed in two principal ways. The first approach has been to study formal ontology as a part of ontology, and to analyze it using the tools and approach of formal logic: from this point of view formal ontology examines the logical features of predication and of the various theories of universals. The use of the specific paradigm of the set theory applied to predication, moreover, conditions its interpretation.

This approach is best exemplified by Nino Cocchiarella; according to whom "Formal Ontology is the result of combining the intuitive, informal method of classical ontology with the formal, mathematical method of modern symbolic logic, and ultimately of identifying them as different aspects of one and the same science. That is, where the method of ontology is the intuitive study of the fundamental properties, modes, and aspects of being, or of entities in general, and the method of modern symbolic logic is the rigorous construction of formal, axiomatic systems, formal ontology, the result of combining these two methods, is the systematic, formal, axiomatic development of the logic of all forms of being. As such, formal ontology is a science prior to all others in which particular forms, modes, or kinds of being are studied." (2)

The second line of development returns to its Husserlian origins and analyses the fundamental categories of *object*, *state of affairs*, *part*, *whole*, and so forth, as well as the relations between parts and the whole and their laws of dependence -- once all material concepts have been replaced by their correlative form concepts relative to the pure 'something'. This kind of analysis does not deal with the problem of the relationship between formal ontology and material ontology." (3).

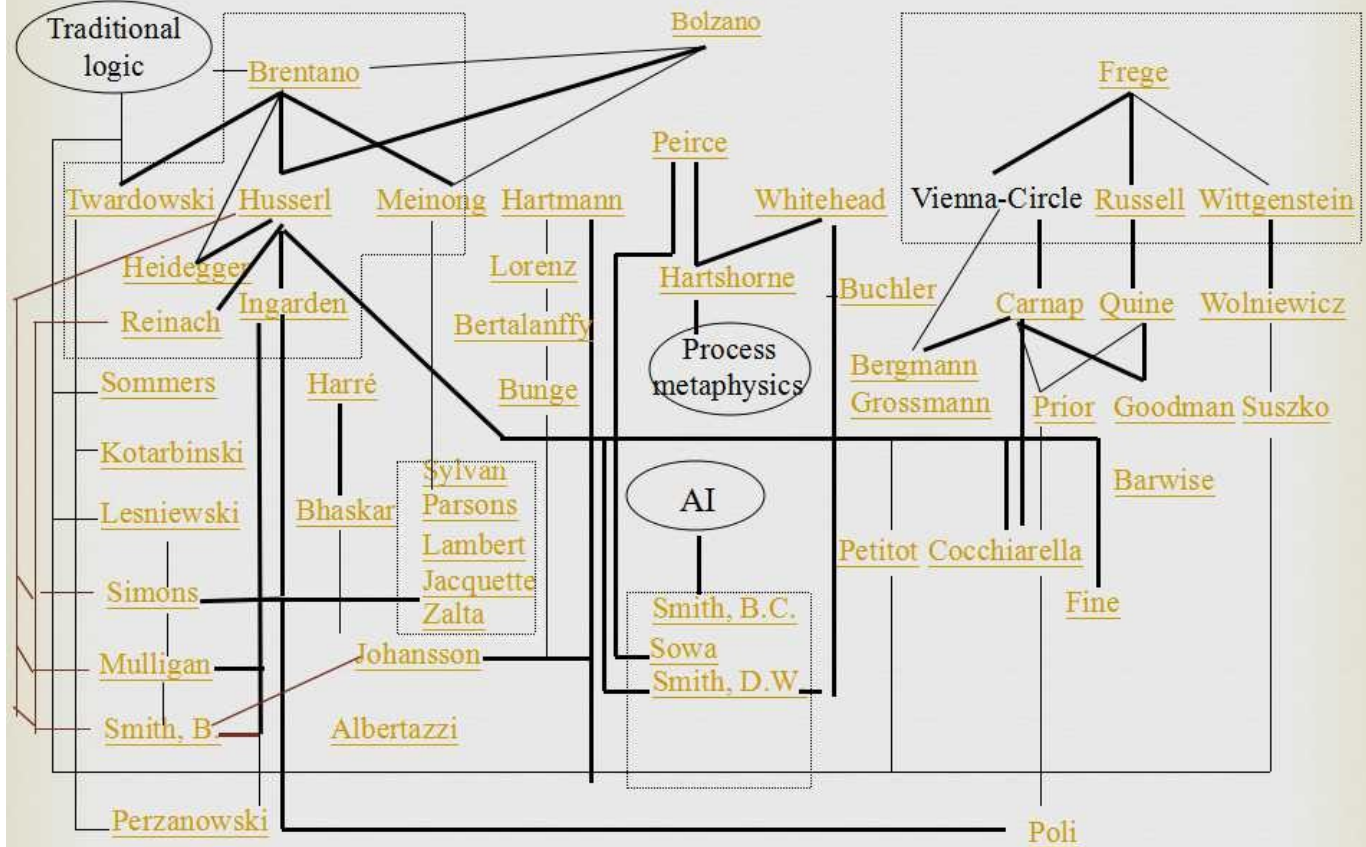
b) *Descriptive ontology* concerns the collection of information about the list of objects that can be dependent or independent items (real or ideal).

c) *Formalized ontology* attempts to construct a formal codification for the results descriptively acquired at the preceding levels.

Major Ontologists

The main intellectual links from the major ontologists of Nineteenth century (Bernard Bolzano, Franz Brentano, and Gottlob Frege) to contemporary thinkers are traced in the "Table of Ontologists":

Contemporary Ontologists. From an initial proposal by R. Poli. Feedback by N. Cocchiarella, I. Johansson, and Barry Smith.



Lines indicate two kinds of dependence: thick lines major dependences and thin lines less relevant dependences. A distinction between individual dependence (from scholar to scholar) and general dependence (from a (boxed) School, Movement or Topical Area to some individual -- or vice-versa) is also considered. Names are reorganized in a (roughly) top-down way according to Authors's birth-date.

For details see *Table of Ontologists of 19th and 20th Centuries*

Detailed information (bibliographies, abstract of relevant publications, and selections of critical judgments) for the thinkers mentioned in the *Table of Ontologists* are partly available and will be completed in the near future; I will publish also pages in French and Italian with selections of critical studies available in these languages, but not translated in English.

An important feature of this site will be the bibliographies about the history of ontology, selected authors and ontological topics that have not yet been covered in such detail; bibliographical entries will not only include the most relevant books, but also a selection of articles from about one hundred philosophical reviews; attention will be paid to the relations with logic, semantics and semiotics, in particular to the theories of predication and reference and to the relation between thought, language and the world.

The completion of this job will require some years; more than 15,000 bibliographic references are already available in the following languages, in decreasing order of frequency: English, French, German, Italian, Spanish; the Bibliographies will be constantly expanded and updated, and new abstracts of existing entries will be added.

I wish to apologize to readers of other languages, not included only because of my foreign language limitations (my mother tongue is Italian), but I hope that students and researchers will find sufficient material for a more thorough study and will enjoy discovering many philosophical treasures, some little known, but in no way less significant.

Metaphysics and Theory of Objects

Metaphysics is the science that studies being *qua* being (Aristotle, *Metaphysics*, Book Gamma), in other words it considers reality, which is to say existent or actual objects; according to Meinong, the *theory of objects* is an a priori science which concerns the whole of what is given, existent or nonexistent. Existent objects must be distinguished from subsistent or ideal objects, such as identity, diversity, or number. Existence and subsistence are the two forms of being, whereas the 'pure object' considered in the theory of objects is beyond being and nonbeing (*On the Theory of Objects*, 1904).

Before Meinong, the Polish philosopher Twardowski developed, according to Ingarden, in his *On the Content and Object of Presentations. A Psychological Investigation* (1894), "the first consistently constructed theory of objects manifesting a certain theoretical unity since the times of Scholasticism and the '*Ontologia*' of Christian Wolff [1730]." (4)

"The relationship between Husserl's conception of ontology and the 'theory of objects' of Meinong has long been misunderstood. As conceived in the *Logical Investigations* [1900], the idea of ontology is not eidetic science of objects. The *mathesis universalis* is accordingly an ontology (only the word is avoided in the first edition). It is characterized as the a priori science of objects in general, and correlatively of meanings in

general, i.e., of meanings which refer to objects in general. Inasmuch as that is brought out clearly in both volumes, Husserl observes that no one is justified in trying to instruct him with regard to the 'object-theoretical' character of formal logic and mathematics. Indeed, the third investigation is explicitly declared to belong to the 'a priori theory of objects as such,' and Husserl suggests that it is this passage that led to the formation of the undesirable expression '*Gegenstandstheorie* [Theory of objects].' Ontology, or the theory of objects in the present sense, not only comprises all that relates to the field of the pure *mathesis universalis*, but includes the first volume as well as the third and fourth investigations of the second volume." (5)

Formal Ontology as a *Characteristica Universalis*

"A system of logic can be constructed under two quite different aspects. On the one hand, it can be developed as a formal calculus and studied independently of whatever content it might be used to represent. Such a formal system in that case is only a *calculus ratiocinator*. On the other hand, a system of logic can be constructed somewhat along the lines of what Leibniz, called a *characteristica universalis*. Such a system, according to Leibniz, was to serve three main purposes. The first was that of an international auxiliary language that would enable the people of different countries to speak and communicate with one another. Apparently, because Latin was no longer a "living" language and new trade routes were opening up to lands with many different local languages, the possibility of such an international auxiliary language was widely considered and discussed in the 17th and 18th centuries. (...)

In any case notwithstanding its visionary goal, the idea of an international auxiliary language is not the purpose of a formal ontology. The second and third purposes Leibniz set for his *characteristica universalis* are what distinguish it from its precursors and give his program its formal or logistic methodology. The second purpose that the universal character is to be based upon an *ars combinatoria*, i.e. an ideography or system of symbolization, that would enable it to provide a logical analysis of all of the actual and possible concepts that might arise in science. Such an *ars combinatoria* would contain both a theory of logical form, i.e., a theory of all the possible forms that a meaningful expression might have in such a language, and a theory of definitional forms, i.e., a theory of the operations whereby one could construct new concepts on the basis of already given concepts. The third purpose was that the universal character must contain a *calculus ratiocinator*, and in particular a complete system of deduction and valid argument forms, by which, through a study of the consequences, or implications, of what was already known, it could serve as an instrument of knowledge. These two purposes are central to the notion of a formal ontology." (6).

Different Approaches

I give also two definitions from philosophers of the Analytic tradition:

"Ontology is intimately related to metaphysics, the theory of ultimate categories of things. Andronicus of Rhodes coined *meta ta physica* as meaning the writings coming "after the physics" in his collation of Aristotle, but metaphysics is really the study with which those writings deal. Some might say that the categories are ultimate differentiations of being and that ontology is the study of undifferentiated being. Now insofar as metaphysics is the study of the nature and existence of broad categories of things, ontology is a branch of metaphysics by logical courtesy. It deals, paradoxically, with the nature and existence of the "category" of undifferentiated being. But strictly speaking, ontology is transcategorical. Of course, if we say, "To be is to be material," we do equate the study of being with the study of matter. But the equation is transcategorical in its very elimination of all categories other than matter. Of course, some ontologists admit different kinds or degrees of being. But even if every metaphysical category is also a kind of being and *viceversa*, so that the words "metaphysics" and "ontology" are coextensive, those words are still not synonymous. Certainly when they are used as I have explained them, they are not intersubstitutable *salva veritate* in every context of discussion.

What does the objective world include? Common-sensically, it divides into many objects: the Sun, the Moon, stars, trees, people, and so on. We also speak and think about thoughts, smiles, numbers, and many other things. There are many similarities and differences among all these things, and this makes hierarchies of classifications possible. Leo the lion and Felix the cat are both feline, and so on. Insofar as our classificatory purposes may vary, the genera of one system may be the differentia of another. Humans compared to cats are generically animal and differentially rational; humans compared to angels are generically rational and differentially animal. (...)

Any system of classifications, on pain of admitting an infinite series of classifications, will end with summa genera or ultimate classifications. This is the level of metaphysical categories. Where change consists of something of a given kind losing old properties and acquiring new ones, nothing can conceivably change in its metaphysical category. It is conceivable that Socrates can fall asleep, learn things, or even change into a rock or tree. But it is not conceivable that Socrates can change into time or into a number. We are not able to describe such transitions because we find nothing generically underlying them to persist through or undergo the transition. Perhaps that is only because such logic-metaphysical substrata have not been found yet in any plausible classificatory system. But I suspect the reason is that our most fundamental classifications are, at least in part, correct." (7).

"The word "ontology" has four established meanings in philosophy. There are two intersecting sets of distinctions. Pure philosophical ontology is different from applied scientific ontology, and ontology in the applied scientific sense can be understood either as a discipline or a domain. Ontology as a discipline is a method or activity of enquiry into philosophical problems about the concept or facts of existence. Ontology as a domain is the outcome or subject matter of ontology as a discipline. Applied scientific ontology construed as an existence domain can be further subdivided as the theoretical commitment to a preferred choice of existent entities, or to the real existent entities themselves, including the actual world considered as a whole, also known as the extant domain. Ontology as a theoretical domain is thus a description or inventory of the things that are supposed to exist according to a particular theory, which might but need not be true. Ontology as the extant domain, in contrast, is the actual world of all real existent entities, whatever these turn out to be, identified by a true complete applied ontological theory. As a result, we must be careful in reading philosophical works on ontology, when an author speaks of "ontology" without qualification, not to confuse the intended sense of the word with any of the alternatives." (8).

In: *A Short Glossary of Metaphysics* by Peter Simons with additional entries by Ross P. Cameron (*), the following definition is given:

" **ONTOLOGY** . From *onto-logos*, the science of being. A surprisingly late coinage. The Latin term *ontologia* was felicitously invented in 1613, independently, by two German philosophers, Rudolf Gockel (Goelenius) in his *Lexicon Philosophicum* and Jacob Lorhard (Lorhardus),

in his *Theatrum Philosophicum*, but first entered general circulation when popularized by Christian Wolff in his Latin writings, especially his *Philosophia Prima sive Ontologia* of 1730. The first known English use of the term "ontology" is 1720. (1) General as distinct from special metaphysics. (2) More limitedly, the list or table of basic kinds of entities. (3) Attributively, as in "Quine's ontology," the basic kinds of entities assumed by a given philosopher. (4) In Ingarden's philosophy, the study of all possible general arrangements of the world, by comparison with metaphysics which concerns only what actually exists. (5) Recently and loosely, in computer science, a set of categories for programming and data representation which is independent of particular hardware, software or implementations."

This definition is historically inaccurate: the Latin word *ontologia* was created in 1606 by Lorhard (seven years before Gockel) and the first occurrence of "ontology" in English can be found in a work by Gideon Harvey of 1663 (see "[Birth of a New Science: the History of Ontology from Suárez to Kant](#)").

(*) Appendix to: *The Routledge Companion to Metaphysics*. Edited by Robin Le Poidevin Robin et al. New York: Routledge 2009, pp. 590-591.

Notes

(1) "To the best of my knowledge, the idea of a formal ontology makes its first literary appearance in Volume I of my *Logische Untersuchungen* (1900), [Chapter 11, *The Idea of Pure Logic*] in connexion with the attempt to explicate systematically the idea of a pure logic -- but not yet does it appear there under the name of formal ontology, which was introduced by me only later. The *Logische Untersuchungen* as a whole and, above all, the investigations in Volume II ventured to take up in a new form the old idea of an a priori ontology -- so strongly interdicted by Kantianism and empiricism -- and attempted to establish it, in respect of concretely executed portions, as an idea necessary to philosophy." E. Husserl, *Formal and Transcendental Logic* (1929), English translation: The Hague: Martinus Nijhoff, 1969, 27, p. 86.

(2) *Formal Ontology*, in: Barry Smith, Hans Burkhardt (eds.), *Handbook of Metaphysics and Ontology*, Munich: Philosophia Verlag, 1991 p. 640.

(3) Liliana Albertazzi, *Formal and Material Ontology*, in: Roberto Poli, Peter Simons (eds.), *Formal Ontology*, Dordrecht: Kluwer, 1996 p. 199 (notes omitted).

(4) Roman Ingarden, *The Scientific Activity of Kazimierz Twardowski*, *Studia Philosophica*, 1947 pp. 23.

(5) Marvin Farber, *The Foundation of Phenomenology. Edmund Husserl and the Quest for a Rigorous Science of Philosophy*, Cambridge: Harvard University Press, 1943; reprint: Frankfurt: Ontos Verlag, 2006 pp. 205-206.

(6) Nino Cocchiarella, *Formal Ontology and Conceptual Realism*, Dordrecht: Kluwer, 2007 pp. 4-5.

(7) Jan Dejnozka, *The Ontology of the Analytic Tradition and Its Origins. Realism and Identity in Frege, Russell, Wittgenstein and Quine*, New York: Rowman & Littlefield, 1996, p. 7.

(8) Dale Jacqueline, *Ontology*, Montreal: Mc-Gill-Queens's University Press, 2002, pp. 2-3.

Main Currents in Contemporary Philosophy

After Kant's rejection of the possibility of a general ontology (1), Bernard Bolzano was the first philosopher who contributed to the new ontological turn, but his work was rediscovered only in the Twentieth century by Husserl (2).

Bolzano's work influenced both Husserl (a disciple of Franz Brentano) and Frege, that are at the origins of the main traditions of contemporary ontology: the *Phenomenological*, the *Analytical*, and the *Austro-Polish* (Brentano was also the teacher of Twardowski, the founder of the Lvov-Warsaw School); the first work of Brentano *On the Several Senses of Being in Aristotle* (1862) and the *Logical Investigations* (1900) by Husserl were at the origin of the interest in philosophy of the most authoritative exponent of *Continental* ontology, Martin Heidegger (3).

Phenomenological

Bolzano and Brentano can be considered the forerunners of this School, founded by Edmund Husserl; the main exponents are Adolf Reinach, Roman Ingarden and Nicolai Hartmann.

Analytical

After C. S. Peirce and the classical works by Frege, Russell and the early Wittgenstein, at least Rudolf Carnap, Gustav Bergmann, Nelson Goodman and W.V.O. Quine should be mentioned.

Austro-Polish

The father of Polish philosophy was Twardowski; Kotarbinski and Lesniewski are ontologists of the first Polish generation (the Lvov-Warsaw School) and Roman Suszko and Jerzy Perzanowski of the most recent times.

Continental

After Heidegger, Merleau-Ponty, Levinas, Deleuze and Foucault, just to mention a few names, are the most debated thinkers; other prominent ontologists are listed in the *Table of Formal and Descriptive Ontologists*.

Notes to Main Currents in Contemporary Philosophy

- (1) "The Transcendental Analytic accordingly has this important result: That the understanding can never accomplish *a priori* anything more than to anticipate the form of a possible experience in general, and, since that which is not appearance cannot be an object of experience, it can never overstep the limits of sensibility, within which alone objects are given to us. Its principles are merely principles of the exposition of appearances, and the proud name of an ontology, which presumes to offer synthetic *a priori* cognition of things in general in a systematic doctrine (e.g., the principle of causality), must give way to the modest one of a mere analytic of the pure understanding." I. Kant, *Critique of Pure Reason* (A247/B304), Cambridge: Cambridge University Press, 1998, pp. 358-359.
- (2) "With such illogicality did things happen in the history of logic which we are pursuing here that this great, born logician fell prey to a fate which beats the fate of Joachim Jungius. For the latter at least was read, and read by a Leibniz; but that cannot even be said of Bolzano. Hence we cannot even maintain in his case that he was forgotten. All the greater is the merit of Edmund Husserl who discovered Bolzano." Hermes Scholz, *Concise History of Logic* (1931), English translation: New York: Philosophical Library, 1961, p. 47.
- (3) "The first philosophical text through which I worked my way, again and again from 1907 on, was Franz Brentano's dissertation: *On the Manifold Sense of Being in Aristotle*." Martin Heidegger, Preface to: William Richardson, *Heidegger. Through Phenomenology to Thought*, The Hague: Martinus Nijhoff, 1963. p. X.

Essays by Various Authors in PDF format

Gianfranco Basti:

Analogia, Ontologia e Problema dei Fondamenti (in Italian)

Nino Cocchiarella:

"Conceptual Realism as Formal Ontology", in: Roberto Poli, Peter Simons (eds.), *Formal Ontology*, Dordrecht/Boston/London, Kluwer 1996, pp. 27-60, Nijhoff International Philosophy Series, vol. 53. (256 KB). This essay is reproduced with the kind authorization of Kluwer Academic Publishers.

"Logic and Ontology", in: *Axiomathes* vol. 12, (2001) pp. 117-150 (Italian translation by Flavia Marcacci, revised by Gianfranco Basti: "Logica e ontologia", *Aquinas.Rivista Internazionale di Filosofia* 52: 7-50 (2009).

"Logical Necessity Based on Carnap's Criterion of Adequacy", *Korean Journal of Logic*, vol. 5 n. 2 (2002), pp. 1-21.

"Conceptual Realism and the Nexus of Predication", *Metalogicon* vol. 16, 2 (2003), pp. 45-70.

"Denoting Concepts, Reference, and the Logic of Names, Classes as Many, Groups and Plurals", *Linguistics and Philosophy* vol. 28 n. 2 (2005), pp. 135-179.

"Russell's Logical Atomism 1914-1918: Epistemological Ontology and Logical Form", unpublished essay (will be removed after publication).

Deontic Logic, unpublished notes based on a course given on modal logic in the late 1960s at the State University of California at San Francisco.

Gustav Bergmann on Ideal Languages, unpublished lecture presented at Indiana University at the *Gustav Bergmann Memorial Conference* (October 30-21, 1992).

Some Remarks on Stoic Logic

Diodorus's Master Argument

Jan Dejnozka:

Being Qua Identity in Russell's Ontologies (2018), unpublished essay posted with the kind permission of the Author.

Piero Di Vona:

Studi sulla Scolastica della Controriforma. L'esistenza e la sua distinzione metafisica dall'essenza, Firenze: La Nuova Italia, 1968.

Marco Forlivesi:

General Bibliography of João Poinset (Joannes de s. Thoma - Juan de sto Tomás - Jean de st-Thomas - Giovanni di s. Tommaso - John of St Thomas)

George Edward Hughes:

The Modal Logic of John Buridan, G. Corsi, C. Mangione, and M. Mugnani (eds.), *Atti del Convegno internazionale di storia della logica: la*

teoria delle modalità, Bologna: CLUEB 1989, pp. 93–112.

Marco Lamanna:

Correspondences between Clemens Timpler's work and that of Jacob Lorhard

Gottfried Wilhelm Leibniz:

Leibniz Classification of the Sciences (1667 - 1676 - 1679)

Leibniz Classification of the Sciences (1697)

Ulrich Gottfried Leinsle:

Das Ding und die Methode. Methodische Konstitution und Gegenstand der frühen protestantischen Metaphysik. Augsburg: MaroVerlag 1985.

I. Teil: *Darstellung*; (23 MB)

II. Teil: *Anmerkungen und Register*. (18 MB)

Jerzy Perzanowski:

Ontological Conditions for Emergence (Abstract) (2002) - Abstract of an essay read at the Conference *Levels of Reality* organized by Mitteleuropa Foundation

Roberto Poli:

Descriptive, Formal and Formalized Ontologies - in: Denis Fisette (ed.) - "Husserl's Logical Investigations reconsidered", Dordrecht, Kluwer, 2003, pp. 183-210

Framing Ontology (1999)

Levels - *Axiomathes* - vol. 9, 1998, pp. 197-211