Carlo Scognamiglio (Sapienza University of Rome)

Workshop on Levels of reality as a KO paradigm

“Strata” and top categories for an ontologically oriented classification

Abstract

In spite of its difficulty, communication between philosophy and classification – and more precisely between ontological research and knowledge organization – is conceptually very intriguing, and implies a lot of problems for scientific research. One of these, which is the object of discussion of this paper, is the theme of the “something” (the matter) of classification. After a quick examination of the debate around the alternative between classification of documents and of entities, the paper shows how every kind of rigorous classification must be supported by an ontology. An example of an ontological approach to knowledge classification is the implementation of the theory of levels of reality. Nicolai Hartmann’s idea of a stratification of the real world is individuated as a robust support to the aim. However a theory of levels needs a set of general categories, common for all the levels. The aim of exploring the fundamental or top categories is pursued through a combination of the critical ontology elaborated by Hartmann and some notions from General System Theory.

1: Philosophical problems in classification

Notwithstanding the difficulties in communication between philosophers and knowledge engineers (in general terms: between philosophers and technicians or practical scientists), the field of research disclosed by classification is rich in implications. A philosophical look on some problems, typical of knowledge organization (KO), can immediately identify some of the traditional issues of Western thinking. This is not the context where it would be useful to describe the nature of classification, but starting with a simple definition could be practice in order to advance some comment. In a recent article, Brian Vickery (2008, 145-146) writes: “A classification is a hierarchical structure of symbolic terms. The symbols point to, or represent, entities in the real or an imagined world. The structure may be used as a ‘finding aid’, or information retrieval tool – to pinpoint a particular sought entity”. To start with, it is possible to observe how each time we consider a classification problem, we are in a symbolic situation. The subject who produces the classificatory activity must translate “something” into a symbol. This operation is merely technical. Each actor can use his favourite symbols (letters, numbers, graphs, etc.) so as he prefers or retains functional to his purposes. The kind of symbols and the praxis of the choice are not important for philosophy, but the “something” that receives the translation is very interesting. Asking what a symbolic code represents is the same as asking for the matter of classification. In the history of librarian debates on documentation we can identify two important perspectives on this theme (Gnoli & Scognamiglio 2008): the idea of classification as a codification and organization of documents, and the view of classification as a structured management of entities.

The notion of classification can refer to documents or contents. In other terms, classifying documents seems different than classifying entities. In the first case there is a double level, because a document is, on the one hand, an entity on its own, with ontological consistency as such, and, on the other side, a representation of something else. A collection of information on the material and semantic peculiarities of the document is possible, but not enough. The first difficulty that emerges from the
distinction between documents and entities can be observed from the point of view of the first term. What is a document? It is not necessary to examine a set of cases now. But even accepting the idea of a document, in a particular sense, as a “text”, it is obvious that the text “is”. In other words, it exists as an entity, it is “something”, and, ontologically speaking, it is not less real than other entities. At least, also the code that occurs in classification is an entity. However, for the moment, I will refrain from rendering the picture more complicate. If the document is an entity, the classification cannot be divided into a classification of documents and a classification of entities. Still, it could be possible to precise that the document is a special kind of entity.

2: From the document to the entity: towards a levels’ classification

There are as many problems with the notion of “entity”. The question of “what is an entity?” can be considered the most important and difficult in the history of Western philosophy. Classifying entities can mean a lot of things. In the recent debate on facetted classification (Gnoli 2008), it is specified that the aim of entities classification is not to “touch” the thing in itself, but to classify “our” phenomena of the world (Gnoli & Poli 2004; Gnoli & Scognamiglio 2008). Obviously also the relationship between phenomenon and thing in itself is really complex, but for the moment it is possible to accept the general idea of classification as an organization of phenomena, and, furthermore, an organization of knowledge. In this sense, an entity is intended as a phenomenon. And a phenomenon is everything constituted in our knowledge, real or ideal. But the notion of phenomenon implies, at the same time, something universal, which makes possible the exchange of information between knowledge actors, and something specific, determined by the difference of the points of view. For most part of database communication, there are problems of interoperability, and the same is valid for a lot of Web applications: from automatic translators to the tag’s systems (Scognamiglio 2007). Knowledge organization systems cannot interoperate without using a common framework of categories. Are these categories objective or conventional? From an ontological viewpoint, according to the way of understanding a critical realism in some philosophical perspective, even if the enterprise can appear very difficult (or a real utopia), the only way to proceed is to analyse the categorial structure of a phenomenon as an objective one. A robust theory for the top categories seems necessary to grant an interoperability for each kind of ontological description of the world.

From Ranganathan to the work of the Classification Research Group facetted classification appears, in a broad sense of the term, the most ontologically oriented approach. Sometimes, as in Ranganathan, the top categories are derived from the lexicon of physics, or, in other views they are designed through an epistemological analysis of the disciplines. This paper tries instead to purpose an ontological query of the fundamental categories, which should be based on some key-problems of our philosophical tradition.

Our guide, on this trip, will be the German philosopher Nicolai Hartmann (1882-1950). He was an important thinker of the last century. Hartmann developed his ontology in many bulky works; the most important of which are: Zur Grundlegung der Ontologie (1935), Möglichkeit und Wirklichkeit (1938), Der Aufbau der realen Welt (1940), Philosophie der Natur (1950). This is not the first time that Hartmann is being
called into the middle of the debate on KO. In the recent past, Ingetraut Dahlberg first, then Giliola Negrini, Roberto Poli and Claudio Gnoli (and me too) referred to Hartmann’s theory of the stratification of the real world to support their perspectives. However, it should be useful to recur to Hartmann’s theory of general ontology.

Among the various ramifications of documentation research, a very intriguing example of an ontological approach to classification is the assumption of a theory of levels of reality. It is a perspective that seems very pertinent to a faceted classification, where facets represent special categories in the peculiarity of each level, and at the same time result as a sort of species of general categories. All approaches to classification – from taxonomies to facets – always require a deeper understanding of general categories. But in the case of facets, the relationship between general and special categories seems different, because the categories of each level of reality show themselves as particular declinations of the general ones. This makes the relationship of comprehending the ones through the others very strong.

3: Hartmann’s theory of strata
A good philosophical model for elaborating on a theory of levels of reality is Hartmann’s critical ontology. In his perspective, the object can be in different modes, and these modes of being constitute the ontology’s frame. In other terms, we must previously distinguish, in the sphere of being, two modes of “givenness”: real being and ideal being. The main difference is categorial and depends on temporality. If the former is the world that is in time and has a time, the latter gives itself to us as atemporal being, that always remains identical with itself. According to Hartmann’s theory of the multistratified constitution of the real world, there is a succession of four strata that are connected by a complex system of categorial laws. The lowest and strongest one, which is the basis of the higher ones, is the inorganic stratum. After this, in ascending order, there are the organic, the psychic and the spiritual strata. The organic stratum keeps the same categories as the inorganic one but adds its own properties. This kind of relation is named over-forming. The psychic stratum, on the other hand, although needing inorganic and organic individuals in order to exist, does not as such comprise the categories of its lower strata. Hartmann calls this kind of relation building-above. Nor does spiritual being, at the upper end, retain the lower categories, and it displays a new set of properties. Hence there are in the world only-inorganic entities, organic entities based on the inorganic stratum, psychic entities based on the inorganic and organic strata, and at the apex, entities of a spiritual stratum based on the other strata. A melody, for example, belongs to spiritual being, but it needs an inorganic base. A musician has a spiritual dimension, as well, but s/he is conceivable only if his/her inorganic, organic and psychic features are taken into account. Making a synthesis: the inorganic stratum’s most important categories are spatiality, materiality, physical causality and substantiality; the most important categories of the organic stratum are: spatiality, materiality, life causality, substantiality and the group of special “life-categories” (for example phylogenesis, reproduction, and so on); the most important categories of the psychic stratum are: psychic causality, constancy and subjectivity (conscience); the most important categories of spirit are: teleological and free determination, constancy, subjectivity (personality) and inter-subjectivity.
However, even in a theory of stratification as intriguing as Hartmann’s, the pivotal question – and maybe Hartmann did not focus on this point – as a primary step is to identify the categories (the modes of being) of an entity as such, irrespective of its being real or ideal. Hartmann (1935; 1938) also elaborated on a theory of common categories, but this seems weak. The first group of common categories is the one of the modal categories (possibility, necessity and reality), which are differently articulated in real and ideal being (Hartmann, 1938). Besides, they are very interesting as regards a metaphysical distinction between ideality and reality, but not as strong when it comes to elaborating a qualitative determination of the ens.

In a second step Hartmann aims to deepen a theory of general categories relative to the only real being (Hartmann, 1940; 1950), where we find temporal categories (existence, process and time) and a large group of elementary polarities (form-matter, element-system, and so on). Based on this series of common categories, Hartmann begins his construction of special stratification categories. He conceives the succession of four strata that are connected thanks to a complex system of categorial laws.

As this paper will try to show, it seems necessary to integrate Hartmann’s ontology with other contributions, although not directly resulting from philosophy.

4: Entia and systems

One of the most important proposals of scientific research in the twentieth century was Ludwig von Bertalanffy’s General System Theory, which with its interdisciplinary vocation proved useful for a wide range of discilplines. Bertalanffy’s intention shares common ground with the philosophy of Hartmann.

A system is a structure that has organized components (Churchman 1979). It is not an aggregate, because it presents a functional division and coordination of labour among the parts. A characteristic of the systems is that the whole is more than the sum of its parts. According to the most important literature on systems, it is possible to individuate two general categories of systems (the idea of finding a set of categories, which prove common to all kind of systems, is not different from the systemic notion of isomorphism):

- **wholeness** (having organized elements): according to Lars Skyttner (2007, 68), “the term wholeness applied to a system indicates the following variation in any element affects all the others bringing about variation in the whole system”;
- **emergence**: the system has emergent properties derived by the synergetic effects of its components, which have not the same properties if isolated.

There are not sufficient reasons to assert the identity between the notion of entity and the one of system. It’s easy to note how the concept of system can be adequate to real and ideal being. In fact, if there are biological systems, psychic systems, and social systems, there are also numerical systems, logical systems, and then ideal systems. More difficult is the question about the axiological systems. For us it is not possible to assert that every entity is a system. In fact, even if there were only systems in the realm of phenomena, we could not exclude the possibility of non-systemic entities. On the contrary, in the real and ideal world, we know of some entities that appear different from “organizations”: they don’t present elements, neither can they be understood through systemic laws. For example, in the domain of geometry, a “point” is evidently a non-systemic entity. In psychology an emotion appears heterogeneous with respect to
the framework of systems. This doesn’t imply that these elements could not be elements of a system, but only that not any entity is a system.

Consequently, entities fall into *simple entia* and systems (if classification is classification of entities, then we can in a general sense distinguish between classification of entities as simple entia and of entities as systems). The central notion of our metaphysical tradition, the *substantia*, can be applied to both concepts. So, systems and entia “share” two important categories, which by the same token result to be fundamental:

- **stability**: all kind of entities can be interpreted through the traditional notion of substantia, but in the case of systems, it seems better to use the term stability (a clarification of this point will be provided in the next paragraph). Then, in a multi-stratified theory of reality (Hartmann 1940), we will distinguish between material substantia and only temporal stability (*constantia*);
- **having an environment**: the environment, as such, cannot be considered as another kind of basic being, similar to entia and systems, because it is a higher system except the system (or the *ens*) itself (Skyttner 2007).

Systems, in the end, can be furthermore distinguished in various ways. The most simple is probably this one:

- **real systems**: non-living systems, living-systems, social systems, artefacts, mentifacts (for example: a mental creation or a message), conceptual systems;
- **ideal systems**: mathematical systems, logical systems, and maybe we can consider even “axiological” systems as such.

It is also possible to elaborate a crossing distinction, exploring the nature of open and closed systems, but this is not the place for this kind of discussion.

What we can observe is an analogy with the theory of stratification of Hartmann, and this represents a further reason for integrating critical ontology with General System Theory.

5: Processes

However, we cannot ignore one of the elements most present in the ontological – but also the documentational – debate: processuality. In fact, an easy objection could be: we don’t only know entia and systems, but also processes, events, and situations. On the contrary, we could observe how every entity is in itself “something in becoming”. This too is an old question in the history of philosophy.

Recently Danish philosopher Johanna Seibt presented a non-substantial ontology. Even if her perspective is not thoroughly original, and in the history of philosophy it is possible to locate more than one predecessor, Seibt’s formula appears ingenious (Seibt 2000; 2008a; 2008b). Seibt wants to abandon the philosophical concept of substantia, and to adopt the approach of a process-ontology. Seibt examines as paradigmatic elements those activities that are not moved by any subject, as “to snow” or “to rain”, and presents them as “general processes”. The general character of these kinds of processes is to have a specific temporal extension, but not a clear and unique spatial delimitation. They are not countable, and can be defined as “homeomeries”: process-entities with uniformity in all the parts, in every point of spacetime. What we call “things” in ordinary language, are entities minimally “homeomeric” in space and maximally “homeomeric” in time. On the contrary, an event such as an explosion, is
minimally homeomorphic in both time and space. In this way Seibt suggests a group of other and more precise distinctions, but this is not the place to deepen them. In the end, we have not the distinction between entities and processes, but only processes.

There are two important objections that we can now raise against this kind of approach. The first one concerns her idea of spatiality. In General Process Theory, how can we define spatial regions, “topographies” of processes, if we are dealing only with a general proceeding of everything? And if we have processes, don’t we also need a “something” (as material) that is subject or object of this processuality, but different from the processuality as such? And is this not, in the end, a sort of substantia? Secondly, with respect to our distinction between real and ideal being, General Process Theory cannot say anything about ideal entities. For this reason, processes cannot be, like “entia” and systems, an explication of the notion of entity, but in the meantime process is the fundamental category of real being. Maybe we can observe that every kind of process, or an event, must be understood in his individual occurrence (e.g. the French Revolution), or as a peculiarity of something (as the kick of a soccer-player), or as a regular process (the movement of the Solar System). In the first case the process is in every aspect of its givennes an ens; in the second one it is an attribution of an ens; and in the last one it appears exactly as a system or, at least, as an attribution of a system.

6: Top categories
So we have, as the objects of classification, entia and systems, which present some fundamental categories. They need an underlying classification, dependent on the modes of being. Entia and systems can be real or ideal. Real entities are processes and are governed by the general category of temporality. Ideal beings, instead, are a-temporal. “A-temporality” is not a negative category, but explains the mode of being of what always is.

According to Hartmann, another fundamental category of real being is individuality. However, this notion is more complex in his general ontology. In fact, ideal being has a form of existentia that requires a kind of individuality. Hartmann’s theory is not very clear in this respect, and maybe we can accept, for the real being, an idea of individuality as an irreversibility (or “ontic hardness”). In this sense, ideal being can be considered generally universal. Not all the systems have the same peculiarities, and for this reason we can consider as a general category of systems the only one to be composed by organized elements. Instead of entia, we cannot take into consideration as general categories the couple part-whole, because we cannot exclude, in the real as in the ideal world, indivisible entities.

This proposal is a starting point for a definition of the top categories of an ontology, but also of an ontologically-oriented classification. From this point of view, it is possible, as some scholars claim, to try to construct a theory of levels of reality, that comprises a more complex and specific study of categories.
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