

E. Jonathan Lowe, *The Four-Category Ontology. A Metaphysical Foundation for Natural Science*, Oxford University Press: Oxford 2006.

No analytic philosopher has single-handedly done more than David M. Armstrong to show that the denial of universals has ontologically strange consequences, and no analytic philosopher has single-handedly done more than E. Jonathan Lowe to continue such a defence and to show (*pace* Armstrong) that kinds cannot be reduced to properties. Lowe has now summarized and clarified his basic ontological views in a new book, *The Four-Category Ontology. A Metaphysical Foundation for Natural Science*. His central theses are:

- (i) there exist both kinds and properties-and-relations (non-substantials);
- (ii) there exist both universals and particulars;
- (iii) these two distinctions can and have to be crossed, whereby the four basic categories of reality are discovered: (1) *substantial particulars* (or ‘objects’), (2) *non-substantial particulars* (or: ‘modes’, ‘tropes’, ‘property and relation instances’), (3) *substantial universals* (or ‘kinds’), and (4) *non-substantial universals*;
- (iv) there are two kinds of relation between the four categories: instantiation and characterization (cf. the figure below).

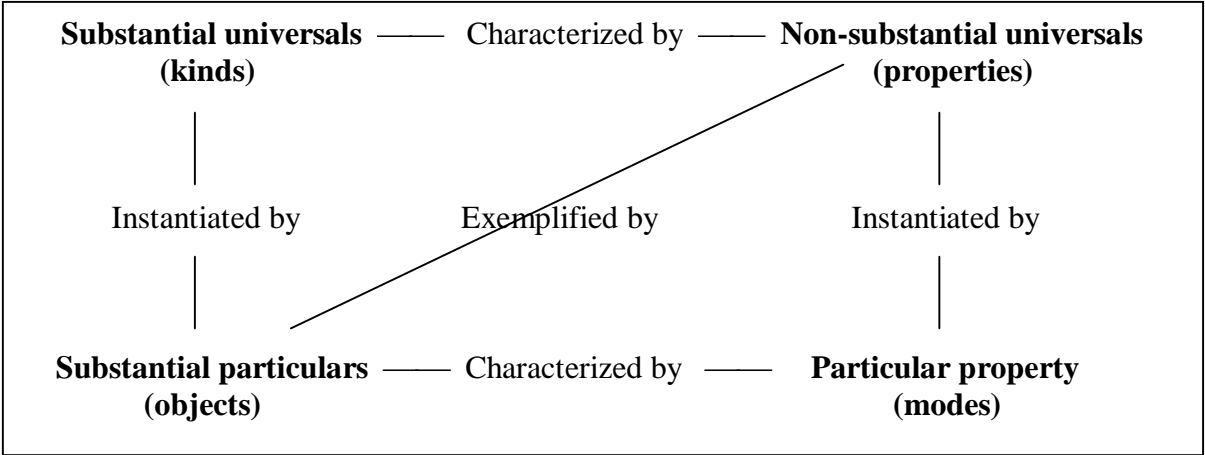
The defence of ‘kinds’ was the basic theme of Lowe’s *Kinds of Being* (1989); all the first three points were put forward in *The Possibility of Metaphysics* (1998), but are remarkably absent from *A Survey of Metaphysics* (2002); the fourth point has earlier been made in some papers, but is now, together with the other three, given an extensive defence. In the new book, Lowe also explains why he regards the four categories he distinguishes as more basic than the two distinctions on which they are based.

From a formal point of view, Lowe’s book is not good when one reads it through chapter by chapter. It is very repetitive, and the introduction of new terms to cover exactly what has already been said in other terms is not pedagogical. But for those who only read isolated chapters, the repetitiveness might be a good thing; and for readers who know Lowe’s old terms very well, it might be a good thing to meet all of them again in this summarizing form. Without reservations, though, I find it bad to call a sub-category of substantial particulars ‘non-substance’ (cf. pages 22 and 39), and to let the first figure of ontological categories (p. 8) be inconsistent with all the others in the book; here, universals are divided into properties and relations instead of into kinds and properties-and-relations.

From a substantial point of view, Lowe’s book can be given two different kinds of brief reviews, focussing either on Lowe’s criticism of so-called one- and two-category ontologies or on his own ontology. This review is of the latter kind; it is even written on the assumption that Lowe’s basic four-partition is true to the world. One-category ontologies are views such as ‘only tropes exist’ and ‘only universals exist’; two-category ontologies accept the distinction between universals and particulars but deny, or regard as ontologically unimportant, distinctions such as that between kinds and properties. Frege has a two-category ontology with transcendent universals, and Armstrong has one with immanent universals. Mostly, I find Lowe’s criticism of these kinds of ontologies to be to the point. The book ends with some chapters on truth, where Lowe puts forward a special version of the correspondence theory of truth. He regards *truth* as an indefinable formal ontological (Lowe’s term) property of timelessly existing propositions, and a *truthmaker* of a proposition as an entity such that it is part of the essence of the proposition in question that it is true if this entity exists.

In Lowe’s four-category ontology, properties and relations are sub-categories of non-substantial universals, and the same has to be the case (even though Lowe does not say it explicitly) with several other traditional Aristotelian categories such as place, time, activity, and passivity. Also, one should note at once that Lowe’s notion of ‘particular’ is not restricted to spatiotemporal particulars. He regards propositions and (with some reservations) sets as *abstract* particulars; the natural numbers, however, are regarded as universals. Lowe is an immanent realist with respect to traditional universals and the natural numbers, but a Platonist with respect to propositions. I find this asymmetry ontologically odd. Lowe defines particulars as entities that cannot be instantiated, but it is not at all clear that propositions cannot be instantiated. If Lowe asserts in Durham and I assert in Saarbrücken “There are both universals and particulars, and there are both kinds and properties”, it certainly seems that the same proposition is expressed and, thereby, instantiated in both these speech acts.

Lowe is not the first philosopher to accept the four categories mentioned. Such an acceptance goes back to Aristotle, and in post-War analytic philosophy it was put on the agenda by K. Mulligan, P. Simons, and B. Smith (in their 1984 paper ‘Truth-Makers’). However, Lowe stresses an important distinction that is seldom stressed and mostly overlooked. It is displayed in the figure below (which is table 6.1 in the book with ‘exemplified by’ added). Let me explain.



First an example: the particular sphericalness (mode, trope) of a particular ball (object) has a relation of *inherence* (which Lowe re-baptizes as ‘characterisation’) to the ball, but a relation of *instantiation* to the property universal sphericalness; also, the ball instantiates the substantial universal (kind) ball. The exemplification relation is not a direct primitive relation. In terms of relation logic, it is a relative product; it goes either via kinds (“dispositional exemplification”) or via modes (“occurrent exemplification”). Lowe calls it an “indirect” relationship (p. 207). That the ball ‘(occurrently) exemplifies’ sphericalness means that there is a third relatum (a mode) such that it both instantiates sphericalness and characterizes (inheres in) the ball. If one really thinks through the fourfold partition under scrutiny in terms of the (formal ontological) relations between its various constituents, then everything tells in favour of the view that the relation between a property universal and an object (exemplification) cannot be of exactly the same character as either the relation (inherence) between a particular property and an object or the relation (instantiation) between a universal and one of its instances.

In retrospect, I find it astonishing that Lowe’s distinctions between instantiation, inherence, and exemplification have not before in contemporary philosophy been expounded with the

same stress and detail. However, I think that the rest of the square is neither perfect nor complete. I doubt that the upper characterization relation *between universals* can be exactly the same relation as the lower one, which holds *between particulars*. Furthermore, the square gives the impression that, just as every existing particular property has to characterize a substantial particular, so every property universal has to characterize a kind (substantial universal). But, at least *prima facie*, this seems to amount to the questionable view that all property universals have to belong to the essence of some substantial universal. Why? Because on the level of universals there can be no accidental characterizations.

With respect to completeness of number of main categories, Lowe argues that even entities such as events and processes that unfold temporal parts in time ('perdurants') can be fitted into his schema, but this is also doubtful. Take what might be regarded as the simplest possible process, a change of property in an ordinary object; for instance, a ball that is undergoing a change of shape. At one instant there is one shape-mode and at the next moment there is another shape-mode. Lowe can assert the following: both these modes instantiate shape universals and are inhering in the same ball, and as a two-plurality the modes instantiate the temporal relation 'coming after'. But then he cannot say anything more; but more is required to be said, since the change has a temporal unity of its own. A simple sum of relations of instantiations of shapes, inferences of shape modes, and the external relation of coming-after lacks the temporal unity characteristic of changes and other perdurants.

Be these doubts of mine as they may. There is a serious lack in Lowe's ontology that I want to spend more words on. A lack that makes it impossible for him to deliver what he promises in the sub-title, namely *A Metaphysical Foundation for Natural Science*.

Modern natural science abounds in quantities, i.e., unities of numbers and physical dimensions such as length, time, mass, electric current, and temperature. Two features of quantities are so trivial that they are hardly ever mentioned: (a) no object can possibly at one and the same time take two values of the same quantity variable, and (b) in case of additive quantities, only quantities of the same variable can be added together to give rise to a sum. For instance, no material object can have two masses, and masses can only be added to other masses (not to lengths, times, electric currents, and temperatures). Any ontology that claims to supply a foundation for the natural sciences has to be able to make sense of these facts, but Lowe's ontology cannot do this without adding one further crucial distinction.

Quantitative expressions such as '5.0307 kg' and '72.0001 kg' contain a numeral connected to a symbol for a physical dimension. Why? Because, I would say, quantities necessarily bring with them the ontological determinate-determinable distinction. *Only* determinates of the same determinable (physical dimension) can be strictly added, and *no* object can simultaneously instantiate two determinates of the same determinable. The numerals '5.0307' and '72.0001' refer to two different determinates of the same determinable (the physical dimension mass), which is referred to by means of 'kg'. Both the determinates and the determinable are first-order universals. The unity between a determinable and its determinates is a unity in the realm of property universals, but Lowe allots all such unifying functions to substantial universals (kinds) and the inherence relation. Therefore, he cannot at present make ontological sense of property quantities. Lowe says correctly that science implicitly presupposes universals and the kind-property distinction, but he fails to notice that the basic variables of classical physics presuppose a determinable-determinate distinction.

This distinction comes from W. E. Johnson's *Logic* (three volumes, 1921-24). Once famous, this Cambridge philosopher has fallen into oblivion, but I think his ill fate is a mere side effect of the dominance within Anglo-American philosophy of one- and two category ontologies. Johnson believed in both the universal-particular distinction and the kind-property distinction. Even he should have benefited from reading Lowe on instantiation, inherence, and exemplification, but Lowe can benefit from reading Johnson on the distinction between

subsumption of kinds (genus-species subsumption) and subsumption of properties (determinable-determinate subsumption).

There might be a reason for Lowe's neglect of quantities. As well aware as anyone else of the ubiquitousness of quantities within the natural sciences, Lowe nonetheless states: "The form of a law, in the simplest case, is just this, on my view: substantial kind *K* is characterized by *Fness*, or, even more simply, *K* is *F* (p. 132)." This fits truths such as 'electrons have a negative electric charge', which Lowe mentions several times, but without a determinable-determinate distinction it cannot even make sense of the statement 'electrons have a negative electric charge of  $-1.6 \times 10^{-19}$  coulomb'. Furthermore, statements such as this are not normally called 'laws' in physics. Mostly, such laws relate several *non-substantial universals* to each other. This is not to deny that there is a place for substantial universals (kinds), too, but the kinds in question are normally outside the equations that constitute the laws in question.

The gas law shows directly what I mean. As its name makes clear, this law is about a certain *kind* (substantial universal), gases, but then it says that the determinates of the determinables volume (*v*), pressure (*p*), and temperature (*T*) conform to the equation ' $(p \cdot v)/T = \text{constant}$ '; and this equation, which only mentions non-substantial universals, represents what is commonly called the law. Lowe says that his statement covers only "the simplest case", but the only complexity he adds in the book is that two different kinds can be related by a relation universal (*R*); we then get the form '*Ks* are *R*-related to *Js*'. This changes nothing in my complaint. Lowe captures an implicitly present component of natural laws that an ontologist such as Armstrong has no immediate place for, but he does not capture the basic form of the laws of classical physics.

There is also another respect in which I find the sub-title of the book misleading. Knowledgeable about Lowe's defence of the category of kind, I expected him to say something about the *kind-to-kind relations* that must exist between kinds that might be said to have different granularities or belong to different levels. But he says nothing at all about what relations there are between (kinds of) organisms, (kinds of) cells, (kinds of) molecules, and (kinds of) atoms. When it comes to the next step downwards, (kinds of) sub-atomic entities, he says something in passing, but this makes the sub-title even more questionable. He writes: "Electrons, then, are not *objects*, in the precise sense which I recommend for the use of the term (p. 75)." If sub-atomic entities do not fit Lowe's four-category ontology, how can he – without any qualifications – claim to have laid a foundation for the natural sciences?

The fact that Lowe takes a bit lightly on the relation between actual science and his ontology comes out very clearly in my next quotation: "I adhere to an *immanent realist* theory of universals, according to which there exist no uninstantiated universals and so, by my account, no uninstantiated substantial kinds (p. 135-6)." Does Lowe not believe that there are any extinct species? At least in his earlier writings, he has subscribed to a philosophy of time according to which only "the now" – and thus only presently existing species – has real existence.

Sharing many of Lowe's basic views, and appreciating many of his ingenious arguments, I must say that this book leaves me with the impression that Lowe has been so busy criticising one- and two-category ontologies that he has not had the time to make his own ontology coherent with respect to important details. It was, though, simply a comfort to read the beginning of the book; here some quotations (pp. 4, 5, v):

- "No special science can arrogate to itself the task of rendering mutually consistent the various partial portraits: that task can alone belong to an overarching science of being, that is, to ontology."
- "This way of looking at ontological knowledge and its possibility demands that we accept, whether we like it or not, that such knowledge is fallible."

- “But, of course, Occam’s razor stipulates only that we should not multiply entities (or, more generally, ontological distinctions) *beyond necessity*.”

Let me end by saying that Lowe has made it clear that one- and two-category ontologists have not “multiplied entities enough”, and that I am of the opinion that nor has Lowe.

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