Dispositions, Laws, and Categories
A Critical Study of E. J. Lowe's *The Four-Category Ontology*

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Abstract

After a short sketch of Lowe's account of his four basic categories, I discuss his theory of formal ontological relations and how Lowe wants to account for dispositional predications. I argue that on the ontic level Lowe is a pan-categoricalist, while he is a language dualist and an exemplification dualist with regard to the dispositional/categorical distinction. I argue that Lowe does not present an adequate account of disposition. From an Aristotelian point of view, Lowe conflates dispositional predication with *hôs epi to poly* statements about what is normally or mostly the case.

Keywords

Ontology, Categories, Laws of nature, Dispositions, Formal Ontological Relations

1. Lowe's Four-Category Ontology

1.1 How many categories are there?

Much dispute in recent ontological research is about how many—and which—basic ontological categories there are. Jonathan Lowe's answer is: four, not more and not less. This answer is not new. Not only does Lowe promulgate it for quite a while,[1] its tradition can even be traced back to the

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[1] Cf. Lowe 1998, ch. 9. A similar account is being argued for by Barry Smith. Cf., e.g., Smith 1997 and 2005.

second chapter of Aristotle's *Categories*, where Aristotle lays out two intersecting dichotomies, one between universals and particulars and the other between inhering entities and their substrates.[2] Being influenced by John Locke,[3] Lowe's ontology is informed by this tradition, and thus his categories are:

- objects (= individual substrates, including substances and lumps of stuff),
- kinds (= substance universals and stuff universals),
- modes (= individual properties, or "tropes", and individual relations) and
- attributes (= property universals, including relational universals).

The claim that Lowe puts forward in his recent book *The Four-Category Ontology*[4] is that his four-category ontology is a unique metaphysical foundation for science, providing us in particular with alternative accounts of dispositions, laws and natural necessity. We are in need of new accounts, or so Lowe says, because previous accounts of laws are not satisfactory and attempts like the conditional (or subjunctive) analysis of dispositions are, in his eyes, doomed to fail. I will, therefore, focus on this aspect of the book and, after a survey of Lowe's ontological framework, discuss his analysis of dispositional predication at length.

1.2 Which categories are the basic ones?

The book's title lets one expect a "systematic and comprehensive account of the four-category ontology and its many explanatory applications", as Lowe also announces in the preface (vi). But this is misleading. The book itself is rather a bundle of once independent papers (listed on p. vi), developing different aspects of Lowe's ontology and defending them against their critics and against alternative accounts, notably that of David Armstrong or that of mono-categorial trope theorists like Keith Campbell.[5] Because of the comparable richness of his ontology, he has to defend his account at several battle-lines: against those who want to do without universals, against those who want to do without substrates and substances, and against those who want to do without property individuals. In each of these particular discussions, Lowe needs to stress certain aspects of his four-category account, while he can treat other things summarily. This is the reason why there is, on the one hand, much repetition and redundancy in the book, and why, on the other hand, the

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[2] On the value of this classical text for contemporary debates cf. Smith 2003 and Jansen 2007a.
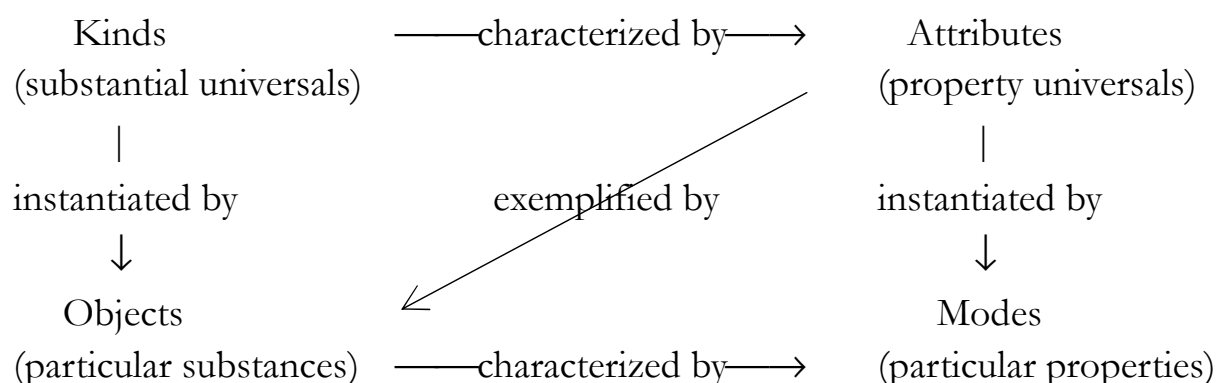[3] Cf. Lowe 1995 and 2005.
[4] Lowe 2006.
[5] Cf. e.g. Armstrong 1997 and Campbell 1990.

treatment of certain topics is widely stretched out over the whole book. For example, dependence relations are discussed in totally different ways in ch. 3.1, ch. 7.8 and ch. 12, and on all occasions somewhat hastily. Whoever wants to have a thorough account of Lowe's thought about this and other topics has also to consult his previous publications, which are, thus, often referred to in the footnotes.

But what, now, is Lowe's account? Again following a long tradition,[6] Lowe presents his four categories using the figure of the 'ontological square':[7]

Kinds ——characterized by——→ Attributes
(substantial universals) (property universals)

instantiated by   exemplified by   instantiated by
↓ ↓

Objects Modes
(particular substances) ——characterized by——→ (particular properties)

The four categories are constituted by combining the substance/property dichotomy with the universal/particular dichotomy. Though constitutive of the four basic categories, universals or particulars are not themselves categories, but are 'transcategorial' (21, 110). They are "mere abstractions and do no serious ontological work on their own" (39). The two dichotomies and thus the four categories are defined in terms of the formal ontological relations that may hold between the entities falling under them: "Kinds are those universals that have objects as their instances. Properties and relations are those universals that have modes as their instances. Objects are characterized by modes. Kinds are characterized by [universals of] properties and relations." (38) Note that, for Lowe, categories are no "elements of being", i.e. they are not themselves universals to be instantiated and characterized, but means of the ontological theory to figure out which kinds of beings there could be.

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[6] Cf. on this Angelleli 1967 and von Wachter 2000.

[7] The book contains several slightly different diagram (cf. the list on p. viii); the following diagram is the attempt of a synopsis of these.

2. Formal Ontological Relations

The diagram of the ontological square contains three relational predicates for "formal ontological relationships": instantiation, characterization, and exemplification. Of these three, Lowe takes instantiation and characterization to be basic, while he takes exemplification to be definable in terms of the two other relations. There is, actually, not only one relation of exemplification, but two distinct ones, and I will discuss them in due course. One way to characterize the two basic relationships is to reverse the explanation of the basic categories: Instantiation just is the relationship between particulars and their universals, while characterization is the relationship between inhering entities and their bearers, be it on the level of particulars or at the level of universals (21-22). But of course it would be circular to define the categories in terms of the formal ontological relationships and these in turn in terms of the categories. It is more informative to explain these relationships in terms of "certain species of metaphysical dependency" (30). Being an "immanent realist" with regard to universals (25, 99), Lowe considers universals to be non-rigidly dependent on their instances (34): In order to exist, a universal must have at least one thing that instantiates it. Thus to be an instance of a universal is to be one of those things on which the universal is non-rigidly dependent. Similarly for the relation of particular characterization: An object x is characterized by a (monadic) mode m, if this mode is rigidly dependent on x, i.e. if x is its bearer and m cannot exist without x.

2.1 Universal characterizations as laws of nature

Characterization appears twice in the ontological square, on the level of particulars and on the level of universals. Characterizations in the 'upper storey' of universals are what Lowe calls "laws of nature". A law of nature is a "state of affairs […] which simply consists in some kind's possessing some property (universal)" (127). They are laws of nature because they are "laws describing the nature of things of the kind in question" (127).

Thus the simplest form of a law of nature is "K is characterized by F". Other laws relate more than two universals with each other, like "Aqua regia dissolves gold", which relates the two kinds *aqua regia* and *gold* and the dissolving-relation universal with each other.[8] Still other laws are formulated in con-

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[8] Here and throughout the text, I follow the convention to italicise names of universals.

ditional sentences: "the law that benzene is flammable, properly understood, is not a non-conditional law, since benzene does not undergo combustion spontaneously: the law is, rather, that benzene burns, or undergoes combustion, *if*, or *when*, it is subjected to a flame" (129). Putting these two distinctions together, we can distinguish the following kinds of laws:

- non-conditional non-relational laws like "Radium decays"

- conditional non-relational laws like "Benzene burns when subjected to a flame"

- conditional relational laws like "Salt is soluble in water when immersed".

There are, however, good reasons to suppose that there are no non-conditional relational laws. If a law is a relation between two or more kinds of things, these things must also appropriately approach each other in order to produce some effect. The instances of the kinds in question must, for example, be in spatial vicinity to each other. Therefore, all relational laws should also involve some conditions.

2.2 Indirect formal ontological relations: Exemplification

It is a welcomed terminological progress that Lowe distinguishes between instantiation and exemplification. Exemplification is an indirect relation between an object and an attribute: While a particular green ball instantiates the kind *ball*, and its green mode instantiates the attribute *green*, it is the ball that exemplifies this very attribute. But there is another indirect relation between objects and attributes, and Lowe uses the term "exemplification" for this relationship, too: it is the relationship between an object x and an attribute F, where x instantiates a kind K that is characterized by F. According to Lowe, this ambiguity of the exemplification relation provides the crucial clue for a viable analysis of dispositional predications. This is, why he later on calls the two varieties of exemplification (though with scarequotes) "occurrent exemplification" and "dispositional exemplification" (207): An object x occurrently exemplifies an attribute F, if and only if x is characterized by a mode m that instantiates F, whereas an object x dispositionally exemplifies F, if and only if x instantiates a kind K that is characterized by F. I shall discuss Lowe's theory of dispositional predication in due course.

2.3 Elements of being and formal ontological concepts

Like the categories and the transcategorial notions, formal ontological relations do not belong to the "elements of being", as Lowe puts it (44-46). A formal ontological relation between two entities holds not in virtue of a relational mode or a relational attribute characterizing this pair of entities. Were this the case, characterization would be a mode or attribute that itself were characterizing pairs of entities, and thus we would have entered Bradley's infinite regress. Rather, it holds in virtue of the ontological form or nature of these entities. Therefore, formal ontological relations are neither relational attributes nor relational modes. This holds true also for identity: For Cicero's being identical with Tully there is no need for a relational mode of identity that is rigidly dependent on those two persons, for they are one rather than two persons anyway, and identity would thus turn out to be a monadic mode. These are the reasons why Lowe prefers to call them "relationships" rather than "relations" (30), a parlance that I followed here in some places. Like the categories, formal ontological relationships could be said to belong to the ontological rather than to the ontic level.

3. Lowe on Dispositions

3.1 The need for exceptions

The reason why Lowe is searching for a new analysis of dispositional predications at all is that he thinks that conditional (or subjunctive) accounts of dispositions are doomed to fail because of finks and antidotes.[9] This is not the opinion of all, and many metaphysicians still think that the conditional analysis can be fixed.[10] Be this as it may, it is indeed a serious objection that there are virtually always cases in which a disposition will not be realized although all of a postulated finite set of realization conditions are fulfilled. Likewise for laws: Laws do not exclude that there are untypical exemplars of a kind. These are the reasons why Lowe wants to have the possibility of exceptions as being part and parcel of his account of laws and dispositions.

His proposal is not to regard dispositions as a kind of properties as opposed to other ('categorical' or 'occurrent') properties, nor as special aspects

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[9] Cf. Martin 1994 and Bird 1998; the first paper is cited by Lowe, the second is not.
[10] Cf. e.g. Mumford 1998, Malzkorn 2000, Gunderson 2000, and Jansen 2004.

of a property as opposed to other non-dispositional aspects. On the ontic level, the level of the "elements of being", Lowe is monistic in this respect. With regard to this question he is (at least in this book), what could be called a 'pan-categoricalist'. Lowe disposes of disposition universals as well as disposition modes. Neither of them, or so he says, is the truthmaker of a disposition ascription. What makes a disposition ascription like "x has the disposition to F" true is rather, according to Lowe, a case of dispositional exemplification: x belongs to a kind K that is characterized by F (31). If this disposition is realized, the object x would, in addition to the foregoing, be characterized by a mode m that instantiates F.

It should be noted that Lowe does also talk about "natural powers of individual objects" and the "possession by an individual object of a relational power", which implies "the existence, or at least the possible existence, of individual objects possessing a reciprocal power" (129). At first glance, this seems to be evidence that Lowe is not a pan-categorialist as I claim. But Lowe never assigns to powers their place within the ontological square, and as the "ontological root" of the distinction between relational and non-relational powers and between conditional and non-conditional powers he refers the reader to the matching distinctions among natural laws (129). Thus if Lowe wants to admit dispositions and their kin among the elements of being, he is not very outspeaking about it in this book.

While being a pan-categorialist, Lowe holds up the occurrent/dispositional distinction on the level of language and of formal ontological relations: for Lowe, there is a difference between occurrent and dispositional predication in natural languages and two exemplification relations matching to this. He could thus be called an 'exemplification dualist'. This proposal has, of course, the advantage of being more economical than dualist theories of dispositions. And it is indeed an intriguing idea that it might be possible to do without dispositions on the ontic level.

3.2 Problems of Lowe's account

But is Lowe's analysis adequate? According to Malzkorn, an analysis of dispositional predication can be said to be adequate, if it fulfils the following con-

ditions:[11] The ascription of a disposition D to be R at a certain time must be (1) logically compatible both with its realization R and (2) with its not being realized at this time. The ascription of dispositions must be in a non-trivial way (3) time-relative, because dispositions can, in principle, be gained and lost. Furthermore, dispositions should be treated as (4) first-order properties that are (5) causally relevant. In addition, it should be (6) possible that the actuality of R can have other reasons than the realization of the disposition D: "A Chinese vase which is fragile may break without being dropped, for example, because an explosive (which would also have broken a non-fragile chunk of wood) was detonated beneath it."[12]

Lowe's analysis does very well on the first two counts. The fact that an object x has a disposition to be F, i.e. that it instantiates a kind K that is characterized by an attribute F, is as well compatible with the fact that this object x is characterized by a mode m that is an instance of F (i.e. with the realization of this disposition) and with the fact that x is not characterized by such a mode (i.e. with its non-realization).

The problems start with time-relativity. In Lowe's picture, dispositions can neither be acquired nor be lost. An object belongs essentially to the kinds it instantiates, they determine its nature. Thus they are the same for an object's whole lifetime. As the laws of nature—the characterization relations on the level of universals—are stable as well, there is no change in an object's dispositions without a substantial change, i.e. without the object either coming into existence or ceasing to be.

It is quite clear that, in Lowe's picture, dispositions are no first-order properties. It is even questionable whether they are properties at all. Lowe rejects the claim that dispositions constitute a group of properties distinct from other properties, both at the level of property universals and at the level of modes. Instead, there are two varieties of exemplification. It is the same universal F that partakes both in occurrent exemplification and dispositional exemplification. Thus there is no distinction between dispositional and other properties on the universal level. Nor is there such a distinction on the level of particulars, for Lowe is not committed to presuppose the existence of dis-

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[11] Malzkorn 2000, 461-462 formulates these six conditions as adequacy conditions for a conditional analysis of dispositions, but they can be used for the evaluation of other approaches as well.

[12] Malzkorn 2000, 462.

positional modes, because such a mode does not at all belong to the truth-maker of a disposition ascription. Thus, one could conclude, there are no dispositions, but only objects that dispositionally exemplify certain property universals.

If there are no dispositions, they can trivially not play any causal role. Nevertheless, even if there are no dispositions that could be causally relevant in Lowe's picture, dispositional exemplification is very closely associated with causality, because it hinges on universal characterization and thus on the laws that are about the behaviour of objects that instantiate the respective universal natures.

Trivially again, if there are no dispositions that could have a causal relevance, a certain occurrence could not be brought about through the realization of *another* disposition. It is, however, conceivable, that an object x belongs to two different kinds K and K^* (e.g. *cat* and *mammal*) that are both characterized by F, or that K (which is instantiated by x) features in different conditional laws that all relate K to F, albeit with different realization conditions. In such cases we could at least say that R could have been caused because of an alternative dispositional exemplification of R by x.

3.3 More problems

There are many more problems for Lowe's account of dispositions. First, in Lowe's picture all instances of the same kind have the same dispositions. Quite a lot of humans are able to speak Chinese, but much more are not able to do so. Those who do speak Chinese, however, do not have this ability because they belong to the human race, i.e. to this very substantial kind, but because of their accidental histories: in this case, because they had appropriate training, be it as a child when learning Chinese as their mother language, or later, when learning Chinese as a foreign language. It is thus not the case that objects have dispositions only in virtue of their substantial nature, and not in virtue of other property modes that inhere in them.

Lowe can try to get a grip on these two problems by recalling the possible conditional structure of natural laws. The basic form of a conditional law is "K is characterized by *F-if-C*" (with K being, as above, a substantial kind, and F and C being attributes), like "*Human* is characterized by *speaks-Chinese-if-having-learnt-Chinese*". Such conditional laws do explain why not all humans speak and understand Chinese: they just have not learnt it. But some oddities still remain. Naively, I assume that learning a language is the acquisition of a

new ability, a new disposition. In Lowe's picture, however, learning is not a means to acquire a new disposition, but a means to remove an obstacle for the realization of a law that characterizes the universal *human being*. What would normally be conceived as a condition for the possession of a disposition now becomes something like a condition for the realization, i.e. for the corresponding occurrent entity. One could also say that learning is the realization of a disposition to acquire other dispositions. It is, however, not at all clear to me, how Lowe wants to accommodate such second order dispositions within his ontology.

Furthermore, Lowe does not contemplate the possibility that there may be different kinds of realizables. He offers no way to distinguish between surefire dispositions, propensities or tendencies and, say, virtues.[13] In particular, Lowe is not able to account for abilities that require a decision for their realization. If an agent x has a certain ability, say an ability to F, it is a matter of decision whether she will F or not, and it may be that she has this options without favouring the one over the other. Then x has the ability to F, but no tendency at all to do so.

He runs also into trouble with multi-track dispositions that have more than one possible realization, with any of these realizations excluding the others. For there must be a law concerning each of these realizations individually, and I see no way how Lowe can tell us that these laws are not concurring, but competing with each other. A medical doctor, say, has the ability to heal people, but the very same knowledge gives him also the ability to kill people.[14] Should we therefore say that the universal *medical doctor* is as well subject to the law "Doctors heal" as to the law "Doctors kill"?

It was one of the tenets of Aristotle that God and the wise (the *spoudaios*) can do bad things.[15] The wise, or so Aristotle says, has the power to do evil, but he has no will to do evil, and in fact, he never will do any evil. Would we follow Lowe's suggestion for the analysis of powers, the universal *wise* would be characterized by *does bad things* because of the wises' ability to do bad things, while no particular wise would be characterized by a mode of *does bad things* (nor by a mode of the corresponding progressive *is doing bad things*). To

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[13] Cf. Jansen 2007b.

[14] The example is, of course, Aristotle's, taken from *Metaphysics* IX 2. Cf. Jansen 2002b, 78-92.

[15] Topics IV 5, 126a 34-35 (*kai ho theos kai ho spoudaios ta phaula dran.*). On this passage cf. Jansen 2002b, 91 and 268.

the contrary, no wise is doing bad things, thus, by induction, the universal *wise* should be characterized by the attribute *does no bad things*. But then, the universal *wise* would at the same time be characterized by the attribute *does bad things* and by the attribute *does no bad things*. This would indeed be an odd situation, and a strange for any theory of laws to account for.

3.4 An Aristotelian diagnosis

What is going wrong with Lowe's account of dispositions? From an Aristotelian point of view the diagnosis would be that Lowe conflates two distinct things. First, there is the distinction between potency and act (*dynamis* and *energeia*) or, in modern terminology, between the dispositional and the occurrent. Hippocrates, or so Aristotle would explain, has the *dynamis* to heal even when he is asleep and not actually healing, while his patient may have the matching *dynamis* to be healed.[16] This is a distinction between kinds of being that is applicable primarily to the level of particulars but can carry over to the level of universals, for example when it is said that architects have the *dynamis* to build houses.

But second there is a certain way of predication at the level of universals that talks about those things that are the case in the majority of cases. "Tigers have four legs", for example, is not a necessary statement, nor a true one, if it is taken to mean that all tigers have four legs. For there are (or there may be) tigers that have only three legs, having lost one in the course of freeing themselves from a mean trap. Of course, "Tigers have four legs" is a meaningful and true statement of zoology, but only because it is meant to mean something like "Normally, or in most cases, tigers have four legs". Aristotle calls this a statement *hôs epi to poly*—"how it is like in most cases".[17] Of course, a three-legged tiger is an odd thing to have in a jungle, because most tigers are four-legged and because it is the nature of tigers to be thus. But the three-legged tiger has no *dynamis* whatsoever—neither a disposition nor a tendency—to get a fourth leg again.

"Tigers have four legs", then, is a statement that holds for most tigers and is not about dispositions. "Tigers sneak noiselessly", however, can be understood as a statement about a disposition most tigers have. The modal operator "In most cases" can both be combined with the ascription of occurrent

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[16] For more on Aristotle's theory of dispositional properties cf. Jansen 2002b.

properties and of dispositions. Thus it should not be conflated with the latter.

4. Conclusion

In this critical study I did not scrutinize Lowe's arguments for his claim that there are four basic categories, in part, because I am sympathetic with such ontology myself. Instead, I focussed my attention to his claim that he provides a metaphysical foundation for science and to his analysis of dispositional predication in particular. I argued that Lowe conflates two things that a metaphysical foundation of science better keeps apart: what normally or mostly is the case is not the same as being characterized by a disposition. Thus it is no wonder that Lowe's account clearly falls short on two of six adequacy criteria for an analysis of disposition ascriptions, while two more criteria must be heavily rephrased in order to fit Lowe's account. Moreover, there are plenty of problems that Lowe's account either cannot solve, or only by paying the price of turning all conditions for the possession of dispositions into mere conditions for their realization. It is true: Many of my examples and misgivings draw on the field of human agency rather than science. Thus a quick answer to these objections could be that Lowe's intention was only to develop a foundation for natural science. But if we let in dispositional modes and attributes in the field of human agency, why shouldn't we accept them elsewhere? Otherwise we have to learn to life with a wide schism in the analysis of dispositional predication in different fields. This is highly counterintuitive and too high a price to be paid.

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[17] The most important references are collected in Jansen 2002a.

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