Four Categories—and More

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For Jonathan

"Philosophy will not regain its proper status until the gradual elaboration of categoreal schemes,
definitely stated at each stage of progress, is recognized as its proper objective."

Alfred North Whitehead[1]

1 Four Categories

Jonathan Lowe has proposed that the four fundamental categories of things in the world are: substances, kinds, modes, and properties.[2] Substances and modes are individual or particular; kinds and properties are universal. Substances are independent; modes are dependent on substances. Their respective species, namely kinds and properties, are themselves generically dependent on instances, bur properties are also indirectly dependent on kinds in that there could not be properties unless there were instances thereof, i.e. modes, there could not be modes unless there were substances, and there cannot be substances that are not of a kind, so properties are indirectly dependent on kinds.

This four-category ontology has a venerable pedigree, going back to Aristotle. In Book 2 of the Categories, Aristotle divides things 'said without combination' into those which are and those which are not said of a subject, and those which are and those which are not in a subject, where by 'in' Aristotle explains he means 'in not as a part, but as unable to exist without' what they are in, i.e. dependent. So the four categories arise from the crossing of two distinctions: the said of/not said of distinction, and the in/not in distinction. Aristotle calls those things which are not in something substance, whether first (individual) or second (universal, or kinds). Those things which are in something are accidents (*symbebeka*).

In modern analytic philosophy, under the influence of predicate logic and its pioneers, this fourfold classification of things at the fundamental level was generally reduced to a twofold distinction between individual things and properties or attributes (allowing for relations as well as properties). Things were what attributes were predicated of, and a sentence was true if the thing in question had or exemplified the property in question.

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[1] Whitehead 1978, p. 8.
[2] Lowe 2006.

As Jonathan has shown, such a reduction is an impoverishment rather than a welcome simplification: it overlooks the difference between those kinds or universals which provide identity conditions for things that fall under them (sortal universals, kinds), and those which merely tell us what things are like (properties). Further, it ignores the grounds in the individuals themselves for the predicability of properties of them, namely their individual modes (or tropes, as they are now more widely known).

As a long-time proponent of the importance of modes or tropes, I am happy to agree that the substance/mode distinction is a crucial one in ontology and that we neglect it at our peril. While unlike Jonathan I am a nominalist rather than a realist about universals, that is a relatively marginal difference of opinion in the present context so I propose to leave it on one side. Nothing in this paper depends on taking one side rather than the other in that dispute. However, where I disagree with Jonathan over categories is not in the ones he proposes and the distinctions he makes, but in considering that we need more than he thinks, and that we need to dig more deeply into how the categories are distinguished one from another.

2 Disputes over Categories

Contemporary philosophy is at length beginning to rediscover the importance of categories. I mentioned in the previous section the impoverishing effect of predicate logic on the acceptance of two of the categories Jonathan Lowe upholds. The spectacular advantages of modern logic over traditional logic and the high prestige attached to its early proponents (Peirce, Frege, Russell) and their intellectual enterprises, combined with the standard way of providing semantics for such logic, conspired to make ontology, and consequently categories, appear to hang on the coat-tails of logic and especially semantics. Whether like Armstrong you accept a fourfold ontology of things, properties, relations and states of affairs, or like Quine an ontology of things and sets, the underlying motivation appears to be that expressions come in different syntactic sorts: names, predicates (monadic and polyadic) and sentences, or that the semantics for predicate logic can be accomplished à la Tarski with just things and sets. Of course there are many variations of ontology among modern logicians. Church for instance, like Frege, has an ontology of things and an infinite hierarchy of functions, while more parsimonious logicians like Leśniewski tried to get by with things alone. But the basic principle appeared to be that the ontology can be read off logic plus semantics. Like Jonathan however, I consider ontology (and indeed all of metaphysics) to be the relatively prior discipline: until we have a general inventory of the items there are in the world we are not ready to give a definitive semantic account of what we are doing when we reason validly.

Taking things this way round deprives the ontologist and in particular the ontologist interested in the most general kinds of things, the categories, of a methodological handrail to assist in determining which categories there are. And indeed the merest glance at the history of philosophy suffices to show a considerable variety of viewpoints exists. The most authoritative history remains the mammoth *Geschichte der Kategorienlehre* (1845) of Adolf Trendelenburg. It is striking how much diversity there was, even in ancient times, when the Stoic theory of categories is completely opposed to that of Aristotle. Most famously, Kant criticised Aristotle for rhapsodically "tossing out" his categories, without system or principle; he replaced Aristotle's eight or ten by his own very different twelve, derived from an analysis of judgement forms that is itself not beyond criticism.

The question of how one arrives at and justifies a certain table of categories is a crucial one once we relinquish logico-linguistic clues. If ontology is prior to logic and language, there is no magic bullet or easy recipe. A system of categories has to prove itself as a framework for common sense and science, and in the to and fro of criticism, both empirical and conceptual. Any help is welcome, whether from the history of philosophy or elsewhere. It is in this spirit that Jonathan's categories are proposed, and I thoroughly endorse the spirit, while disagreeing with some of the details.

3 Two Kinds of Categories

Aristotle's categories are clearly intended to delimit the fundamentally different kinds of thing in the world: they are the supreme genera of being. As such they are *ontic*. Whether they actually succeed in "dividing reality at its joints" is moot, but that is the intention. Kant's categories on the other hand are not intended for any such thing. As a transcendental idealist, Kant does not think we are able to divide reality as it is in itself, but only as thought by us, or brought under concepts. His categories are therefore (merely) organising principles of cognition, and this is why he looks to the forms of judgement to provide the "transcendental clue" for the categories. It is not often I find myself in agreement with Kant, but in one respect I think he is right. We need certain concepts in order to make sense of experience, and some of these concepts fail to correspond to distinctions in reality. Since these concepts are there to help us in the knowledge enterprise, I call them *auxiliary* concepts and the most general ones auxiliary categories.

Among the auxiliary categories are existence and the logical constants. Wittgenstein famously said of the latter that they "do not represent" (sc. anything in reality), but serve the "logic

of facts".[3] Put another way, we would not need the logical constants of negation, conjunction, disjunction, implication, quantification etc. if we were omniscient. God does not need to know that something is not in a certain way, e.g. that the earth is not a sphere, since she knows exactly in what way it is. Nor does she need to know it is this way or that, since she knows definitively it is this way. Negation, disjunction, existential quantification are all expedients for helping us over our partial ignorance. Existence is not a category dividing things because everything exists, and I think there are a host of other auxiliary categories including modality and abstraction. No matter, auxiliary categories are not my focus: ontic categories are. Like Aristotle and Lowe, I think some categories are ontic: they are concepts that (assuming things go well) divide reality at its joints, that is, reflect fundamental distinctions among the things themselves.

4 Factors: Grounds of Categorial Distinctions

Leaving aside the question of how we come up with and defend a particular scheme of (ontic) categories, we may ask what is different about things that is the reason or ground in reality why they fall into these different categories. One answer might be that there is nothing: they simply do. I call this view *surdism* because it makes categorial distinctions surd or brute. Now at some level or other there may be surd distinctions, but not here, I think. The reason is that when we distinguish things in the different categories we have quite a lot to say about what it is that does so. For example substances differ from accidents in that substances are independent while accidents are dependent on substances. Admittedly there is a little more to it than this when we come down to details, but the basic distinction remains, and it turns on the idea of dependence, about which Jonathan has written insightfully.[4] Likewise the universal/particular distinction turns on whether something is the kind of thing that can be predicated or said of another thing, or, as I would say (since predication is a logico-linguistic notion) whether something is such that other things can exemplify it or not. Universals are exemplifiables, indeed they are exemplifieds, particulars are only exemplifiers. Another distinction which is important in many ontological schemes is the distinction between things that are simple and those that are complex. Simple things are those which have no (proper) parts, while complex things have proper parts. Another distinction we find in many schemes such as that of Aristotle is that between the container or place of a thing and the thing in that place, location versus occupant. The last two distinctions turn on relations of part–whole and

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[3] "My fundamental thought is that the logical constants do not represent. That the *logic* of the facts cannot be represented." Wittgenstein 1922, 4.0312.
[4] Lowe 2010.

occupation.

I suggest that all categorial distinctions among things can be given at least a partial descriptive–explanatory account along these lines, in which grounds of the distinction are given. To have a name for the grounds of categorial distinction, I borrow a term from mathematics and call them *factors*. An ontology which explicitly mentions and gives an account of the factors distinguishing the categories I call a *factored ontology*. It turns out there are more of them than one might expect.

5 Some Factored Ontologies

We already saw that Aristotle's and Lowe's fourfold distinction between substances, kinds, properties and modes is a factored ontology. It has a precedent. Empedocles divided stuffs into the four elements, which were earth, air, fire and water, and mixtures of these in different proportions, giving the variety of stuffs we observe around us. Aristotle apparently approved of and used Empedocles's theory. The four elements however do not simply sit there as four different basic stuffs: they are generated by two distinctions or factors: the temperature factor (hot vs cold) and the humidity factor (wet vs dry). Hot and wet gives air, hot and dry gives fire, cold and wet gives water, while cold and dry gives earth. The elements are the basic kinds of things that exist: wetness, hotness etc. are accidents or properties of the elements, and cannot exist separately. But the accidents are the factors that generate the elements. In the same way, the predicability or exemplifiability factor and the dependence factor generate the Aristotle–Lowe fourfold distinction.

Notice that as Empedocles's factor are not elements, so these factors are not among the categories: dependence or being dependent or an individual instance of one thing depending on another are not in any of the categories. This is a general feature of factors: they are behind the categories, not among them. So they do not exist in their own right, but only in so far as they occur in and differentiate the basic things that exist. Jonathan Lowe is one of the few ontologists to have realised this. It may be this peculiarly ethereal status that lends credence to the idea that the differences among the categories are surd.

Once the idea of factoring is understood, it turns out that several prominent category schemes are factored. The eight categories of Aristotle's mature category scheme appear to resist factoring, but if we follow the painstaking investigation of Franz Brentano's doctoral dissertation *On the Several Senses of Being in Aristotle* (1862), written with Trendelenburg as supervisor, it

turns out that they are also factored, according to the following "family tree":[5]

Entity
 Independent   SUBSTANCE
 Dependent   accident (*symbebekos*)
  not wrt another affection (*pathos*)
   inherent
    wrt matter   QUANTITY
    wrt form   QUALITY
   dynamic
    source   DOING
    target   UNDERGOING
   circumstantial
    where   PLACE
    when   TIME
  with respect to another   RELATION

Kant's categories, though auxiliary rather than ontic, are expressly factored: each object is characterised by four factors, from the four families of Quality, Quantity, Relation and Modality. Each of these families has (according to Kant) three members or values, so if all combinations are consistent there are $3^4 = 81$ possibilities. From the Aristotelian point of view there are then not twelve but 81 categories of object, and what Kant calls the twelve categories are not the kinds of objects but the factors.

   The most sophisticated use of factoring in ontology is due to the Polish phenomenologist Roman Ingarden. In his largest work *The Controversy over the Existence of the World* he distinguishes between categories (which he calls *modes of being*) and the factors (*moments of existence*) that generate them. He distinguishes four different notions of dependence and independence, and other distinctions, eventually generating 15 categories of object, including past and present things, events and properties, states of affairs, intentional objects like fictional characters, ideal objects and the absolute. While Ingarden's categories are fairly conservative, his method is explicit factoring and is not.

   It is not just in ontology that explicitly searching for factors helps to generate better

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[5] Brentano 1862, 177.

classificatory schemes. The two most mature classificatory disciplines, namely biology and library science, have separately but convergently come up with factoring as a way to impart sound taxonomic system. In library science, following the conceptual revolution introduced by S. R. Ranganathan (1892–1972), factors are called *facets*; in biology, following another conceptual revolution introduced by Willi Hennig (1913–1976), they are called *characters*, and those which serve to identify past events of speciation and build the phylogenetic tree are called *synapomorphic* characters. Neither facets not characters are in themselves revolutionary: they simply consist in looking for common properties behind the differences among things. What makes them (and factoring in ontology) special is that they take the construction of classifications beyond simply dividing and grouping, and they systematise it to a greater level than hitherto. Both aspects are welcome to ontology.

6 Categorial Flexibility

Ranganathan expressly introduced facets in order to solve a problem facing document classification. In any but the most elementary division of objects they are divided in different respects, and this gives rise to the possibility of cross-classification. Should a book about the class system in 18th century France be classified under the sociology of class or social history or French history or the history of the 18th century? All are possible and in principle none is inherently preferable to the others, whatever a librarian's needs for shelving similar books together. Likewise, in Kant a judgement may be positive, apodictic, hypothetical and singular, as in 'If John saw the accident, he was in the front of the house'. There is no point served in saying it is primarily positive, or primarily hypothetical. It is all four, equally. Likewise, in Aristotle's fourfold classification, a mode is particular and dependent, but it is not one before it is the other. What this means is that when category systems become more ramified, as for example that of Ingarden, none of the factorial distinctions takes inherent priority over others except in the case where one distinction presupposes another, as some do. For example in Aristotle there is no sense in asking whether a substance is a substance in respect of something else, but there is sense in asking whether an accident is in respect of something else, for that distinguishes between non-relational accidents like being white and relational accidents like being taller than Socrates, whereas the idea of a relational substance appears nonsensical.

When does an ontologist know she is getting near to bedrock? When the concepts used to explain distinctions use the distinctions themselves. The use of auxiliary categories, such as logical concepts, may be accepted, for example it is acceptable to qualify a substance as *not* dependent, since auxiliary categories are topic-neutral go-anywhere concepts that cut no ontological ice. It is different if ontological concepts crop up in the explanation: then that ontology needs to be considered as part of the categorial machinery. Take again the concept of substance. At first sight this appears to be straightforward: something is a substance if it is not dependent on anything else. But while this is a fair concept, it may set the bar too high. By this standard, perhaps only Spinoza's universe counts as a substance, and everything else, including you and me, as a mode. Or it may be that nothing composite can count as a substance, since a composite as such depends on its parts: without them, it would be no composite. That would suggest by contrast that Leibniz's view on substances, that they are monads with no (proper) parts, is to be preferred. Of course an Aristotelian would think (I believe correctly) that there are many substances, and that some or many of them are complex. Therefore more effort needs to be put into deciding what kind of independence is at stake when something is to count as a substance.

Some substances appear to have some of their parts essentially. An organism has some genetic material essentially, for example. Perhaps a person has her brain essentially, it being essential to her existence and continuation as a person. Assuming an oxygen atom is a substance, its individual nucleons are essential parts of it. Assuming a star is a substance, for it to be a star it must be massive enough to sustain nuclear fusion during its lifetime, so it absolutely must be complex rather than simple. But for anyone who like Jonathan Lowe subscribes to sortalism, the view that the kind of an individual dictates the kind of persistence and continuation it may sustain, the individual star is also, if in a different sense, dependent on the kind *star*. Further, an Aristotelian substance is an enduring individual or continuant, one which exists in time but persists in its existence from one time to another not by the accretion of ever new temporal parts, the way a process does, but by being the selfsame identical thing at different times. So for something to be a substance it has to be such that it is independent of any individuals which are not parts of it or are essential to its coming into existence (such as an organism's parent or parents), while it may depend generically and perhaps physically on the presence of certain conditions or kinds of material (e.g. a human being is dependent on warmth and water, but not on any particular source of warmth or any particular batch of water).

Putting all of this together we might hazard a definition of an Aristotelian substance as a

single individual that exists at more than one time, exists at different times not by virtue of having successive temporal parts, and is such that it does not depend on any individuals except those if any which are essential to its coming into existence and those if any which are essential parts of it throughout its existence. Whether this is the final word or not, it is closer to the reality than the simple formula that a substance is an independent individual. Now collect together all the non-auxiliary concepts involved in this: we have existing at a time, parts, temporal and essential, and perhaps the idea of an essential generator. While existence as such may be an auxiliary concept, existing at a time is not, though for some kinds of thing to exist *is* to exist at some time or other. It is an ontic matter whether a given (temporal) object exists at a given time or not. Therefore we need the notions of time, part, dependence and essence (along with some logic) to explicate what it means to be a substance. I suggest then that all of these go into the mix as potential factors.

Or take the concept of exemplification (or instantiation, I am not here troubling to make a distinction), needed to distinguish universals from particulars. A universal is something that is essentially such that it exists only if something exemplifies it, whether it is a substantial or an accidental universal. Indeed for it to exist is perhaps indeed simply for something to exemplify it, to be a this of this kind, or a this like such and such. For a realist about universals, this makes exemplifying into a candidate factor. For a nominalist, the buck is passed back to the idea of similarity in a respect and the abstraction of this respect from the plurality of things thus alike. If both of these are auxiliary notions, so is that of a universal.

Consider again the candidate factors we have so far rounded up: dependence, part, essence, time, perhaps exemplification. Dependence and essence seem to go closely together and may be part of a single family of factors. Certainly when we look at their modal features they look remarkably similar: x depends on y if x cannot exist unless y exists (with various riders); x is essentially F if x cannot exist unless it is F. One might suppose this means we can explicate dependence and essence via modal notions of necessity and so on, but Jonathan has argued convincingly that modality is too loose and sloppy a notion to fully characterise the idea of dependence. So let us leave modality aside, not deciding whether it is auxiliary or ontic, and accept dependence and essence as ontic factors, whether of one family or two.

Part–whole is not one of the four categories, but the relationship is all around us, and ontology cannot get by without it. But it is no auxiliary: it is a matter of independent ontic fact whether this or that object is part of another. We simply aspire to recognise such facts, and an omniscient being would know them. Now consider time. Like space, time is a dimension in which things may be extended: processes have temporal as well as spatial parts. A football match is played in two halves, one of which is finished before the second begins. These are temporal halves, unlike the spatial

halves consisting in the events occurring in the two spatial halves of the football field. The ontology of space and time is a minefield of difficulties, starting with the key question whether space and time exist as entities in their own right or are in some manner parasitic (dependent) on the events and things in them. The physical and metaphysical jury is still out on that dispute so there is no point in trying to adjudicate it here. Suffice it to say that if spaces and times exist they appear to be particulars, whether substantial or not; simply slotting them into the categories of particulars fails to do justice to their key roles in ontology. We should therefore consider the more neutral relation of *occupation* (of locations by their occupants) as a candidate factorial relation, and then seek to distinguish space from time in some other way. Occupation makes sense outside space and time as well: abstractly, the black queen occupies position d8 at the start of a chess game, while the number 43 occupies place 14 in the sequence of prime numbers.

As to what distinguishes space from time, I am inclined towards the causal theory, according to which spatiotemporal location A is absolutely earlier than B if and only if there can be a causal influence of some event at A on an event at B.[6] That brings causation into the picture as a potential ontic factor, and I am happy for it to be there. Arguably, not everything that happens is caused to happen: standard interpretations of quantum theory accept that some events happen spontaneously, or uncaused. However even an uncaused event cannot be made not to have happened once it has happened: it and its existence are determinate from the time of its occurrence. A future event may be undetermined by present and past events, and when coming about, if not uncaused, then it will have been determined by prior events. So I consider the concept of determination, which may properly encompass causation, as another candidate factor. The present of an event is the cusp of its determination: before then it is not determined, afterwards it is.

There are other candidate factor families I would include on the ontic side: number and plurality among them. Number seems like a purely logical concept, because we can define numbers logically, but it is an ontic fact whether an animal has two or four legs, for example, and not something we merely throw over the appearances as a conceptual aid. The reason we can define the numbers is that we can use the concept of numerical difference $\neq$, and this is an ontic concept for two reasons. Firstly, what makes it true that $A \neq B$ is an ontic matter: it is there being both A and B. Or to put it in the idiom of truthmaking: the truthmaker for $A \neq B$ is (just) A and B, those things. Secondly, for those who (like myself) consider that Leibniz's Principle of Identity is a conceptual truth (here expressed contrapositively):

$A \neq B$ if and only if A exists and B exists and for some F: F(A) and not F(B)

it would appear that the respect in which A differs from B must be ontic. So number is not purely

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[6] Cf. van Fraassen 1970.

logical at all, but has its roots in the ontic fact of difference.

Taken together, these various factor families generate a much richer system of categories than just four, and to overlook the contributions of all of them is to engage with ontology at too abstract a level, or to impute more to the Kantian side of categories than a realist should. The exact number of categories that result from the crossing of factorial distinctions is not clear, and perhaps is not all that important. Rather the work for ontologists consists in investigating the factors in their families, separately and in combination. Well developed theories of number and part/whole already exist in the form of arithmetic and mereology respectively, and the ontology of space and time has been attacked from the geometric as well as the physical side. Jonathan has contributed to the theory of dependence, as have others such as Kit Fine and Fabrice Correia. There is much work still to be done, but it is progressing in various quarters.

8 Basic Relations

Whereas the factored ontologies we discussed at the outset are all discrete or digital, in that each factor family consists of a finite number of values, often just two, the approach to factoring outlined in the previous section highlights formal relations such as difference, part–whole, determination, occupation, dependence. This in turn implies that rather than dividing objects according to whether they do or do not have parts, whether they are one or many, whether they are past or future, and so on, the ontological facts of note concern whether this object is part of that, earlier than that, partially determinative of that and so on. This is another reason why it will be hard to nail down a finite list of categories. For example, is a collection of three things of a different category from a collection of five things? If the difference between one and more than one is a categorial distinction, it seems so, yet both three and five are many rather than one. Rather than allowing pseudo-disputes as to what is a categorial distinction and what is merely a taxonomic one, it seems more sensible simply to pursue the differences as they arise.

An interesting common feature of the basic relations of difference, part–whole, determination, dependence, exemplification and so on is that they are all, as relations, in a certain sense unusual or odd. Whereas with an honest-to-goodness relation like being a parent of or being older than we can happily consider what might be the truthmakers for the relational truths involved, in all of these cases we come across a puzzle. If we try to treat the relations (*qua* instances or relational tropes) as parts of the furniture of the universe, they readily generate vicious infinite regresses. If A's exemplifying B is a relation, what about A's standing in the exemplifying relation to B? We get the

Plato–Aristotle Third Man regress. If A stands in R to B, is A related to the relation? We get one of Bradley's regresses. If being a part of something is a relation, is it itself part of the whole in addition to the part that is part of it? If two things are different from each of the two, is the one different from the two in the same way that each one is different from another? If determination happens at a time, is determination itself determined to happen? Is it essential to A that it is essentially F, in addition to its being essentially F? And so on. While some of these regresses may arise from confusion, or are ultimately benign, enough of them survive as concerns for us to detect a pattern. The pattern is this. When we are close to metaphysical bedrock, the same questions keep arising about the basics as we use the basics to explain. In the case of relations, we have a name for it, namely that the relations in question are *internal*. A relation R is internal to A and B iff it is essential to A and B jointly that ARB, so that necessarily, if A and B both exist, then ARB. We might say the relation R is essential to the pair A,B in the way that an essential property is essential to its sole bearer.

Internal relations are actually badly named in my view, because there are no such things (as particulars or universals) as internal relations. The reasons for thinking this are two. Firstly, when a relational predication 'ARB' is true for this sort of reason, we do not need a third thing alongside A and B to act as truthmaker for it, for by the nature of internal relatedness, A and B between them suffice to make it true that ARB. So on parsimony grounds we may dispense with the relation as a truthmaker or constituent of one. In addition to A and B, we don't need a third thing called the difference between them to make it true that A ≠ B. In addition to A and B, where A is an essential part of B, we don't need any additional part-of relation. Indeed the idea of a part-of relation as a constituent of reality is difficult to stomach even for non-essential parts, and we should perhaps look simply to common parts as truthmakers for statements of mereological overlapping. Secondly, if there is no relation as a third thing alongside the items related, there is nowhere for a regress to get started. If two modes are of the same kind, they are essentially alike, e.g. two modes of sphericity in two ball-bearings. That they (these two modes) are alike is an internal relatedness: they could not both exist and be unalike. So their likeness is not a third thing that gives rise to a regress of similarity such a Russell supposed characterises any nominalistic attempt to eliminate universals.

I suggest that the basic relations in factor families are one and all "internal", not actual relations. It is another reason why factors are "ethereal". For all that, the differences resulting, between one and many, between simple and complex, determined and undetermined, earlier and later, et cetera, are real differences. It is through these differences that the factors may be said to "exist". They are not among the things of the world, among the things falling into the various categories, yet they structure these things in all their ontological aspects. They exist only insofar as things exist which are so structured. As Whitehead said with his own single ultimate of creativity in

mind, "In all philosophic theory there is an ultimate which is actual in virtue of its accidents. It is only then capable of characterization through its accidental embodiments, and apart from these accidents is devoid of actuality."[7]

9 A Vision of Metaphysics

The search for a good scheme of categories is a good place to start and pursue ontology. But it does not stop there. Once basic factors have been provisionally identified, they need to be specified or at least constrained axiomatically, both separately and in their combinations. This becomes the enterprise of formal ontology, as envisaged in his *Logical Investigations* by Edmund Husserl. It is slow and difficult work, and to date incomplete. Husserl's more specific enterprises of regional ontologies for different (and in Husserl's view, fixed) subdomains of being should in my view be replaced by a general commitment to follow the formal kinds of entity identified in formal ontology into the many varieties of thing identified in our experience, whether everyday or in science. I call this enterprise *systematics*, by analogy with the overall taxonomic–investigative branch of biology going by that name. In systematics one comes into contact with empirical knowledge and the taxa identified in classificatory schemes are material rather than formal, as for example the differences between archaea, bacteria and eucaryota, between glucose and dextrose, between particles with mass and those without. While ontology is the business of philosophers, if need be relying on the assistance of logicians, linguists, historians, computer scientists, physicists, indeed anyone who can offer anything of interest, it is in systematics that ontology comes to application, and pays its way. An ontologist without an interest in the direct application of her theories and distinctions to the real world but prefers to slug it out *a priori* with other philosophers is shadow-boxing and deserves all the neglect with which real scientists often unfairly treat all philosophers. By the same token, an ontologist who is afraid of making errors, chancing speculative hypotheses, or getting empirical dirt under her philosophical fingernails, is playing a self-indulgent glass-bead game. We need metaphysicians who are committed to the real-world relevance of their theories, while neither minimising the considerable difficulties involved nor supposing that the scientists can do their work for them. There are not too many such metaphysicians. Fortunately, Jonathan Lowe is one, and while we do not see eye to eye on theory, we do agree substantially on the importance of the right attitude to metaphysics: realist, ambitious, yet realistically fallibilist, and above all, serious. I salute him.

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[7] Whitehead 1978, 7.

<p style="text-align:center">References</p>

Brentano, F. 1862. *Von der mannigfachen Bedeutung des Seienden nach Aristoteles*. Freiburg: Herder. English translation *On the Several Senses of Being in Aristotle*. Translated by R. George. Berkeley: University of California Press, 1975.

Ingarden, R. 1948/49. *Spór o istnienie świata* [*The Controversy over the Existence of the World*], Kraków: Polska Akademia Umiejetności, I 1947, II 1948, III 1961. German translation *Der Streit um die Existenz der Welt*. Tübingen: Niemeyer, I, II/1, II/2 1964, III 1961. Partial English translation *Time and Modes of Being*, translated by H. R. Michejda, Springfield: Charles Thomas, 1964.

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

—— 2010. Ontological Dependence. *The Stanford Encyclopedia of Philosophy (Spring 2010 Edition)*, Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/spr2010/entries/dependence-ontological/>.

Trendelenburg, A. 1845. *Geschichte der Kategorienlehre.* Repr. Hildesheim: Olms, 1979.

van Fraassen, B. C. 1970. *An Introduction to the Philosophy of Time and Space*. New York: Random House. 2nd ed. New York: Columbia University Press, 1985.

Whitehead, A. N. 1929. *Process and Reality*. London: Macmillan. Corrected edition., ed. D. R. Griffin and D. W. Sherburne, New York: Free Press, 1978.

Wittgenstein, L. 1922. *Tractatus Logico-Philosophicus*. Translated by C. K. Ogden, London: Routledge & Kegan Paul. Originally published as "Logisch-philosophische Abhandlung", in *Annalen der Naturphilosophische*, XIV (3/4), 1921. Translated by D. F. Pears and B. F. McGuinness, London: Routledge & Kegan Paul, 1961.