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Introduction

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The world we live in is a very rich and varied place. There are elementary particles and elegant robes, magnetic fields and mass demonstrations, supra conductors and the French nation. But the world around us is not merely a smorgasbord of very many and very different things. Rather, it exhibits significant *structure*: some features are *more fundamental* than others, some phenomena *depend* on other phenomena, and certain things exist only *because* others do. It is a widely shared belief that metaphysics should be concerned not only with the question of what kinds of things populate our world, but also with such structural facts—facts about how the different kinds of things relate to each other in matters of metaphysical priority.

This collection focusses on four notions that have been used to formulate metaphysical claims about the structure of the world: *ontological dependence*, *grounding*, *supervenience*, and *response-dependence*. The collection aims at both providing a useful guide to the novice reader as well as making a contribution to the current debates involving these notions. To this end, contributions of two different sorts are included. For each of the four notions, the collection contains a *survey paper* introducing the pertinent concepts and distinctions, and summarizing the state of the art of the debate. A fifth survey paper, on Aristotle's notion of ontological dependence and its relevance to the notion of a substance, provides some of the historical background. These survey papers thus provide the theoretical basis for the *research papers* that make original contributions to the current debates. The collection should therefore be accessible to the reader new to this exciting area

of metaphysics as well as to the expert who will, we hope, find new insights and perspectives in both kinds of contributions.

The question of how the notions of ontological dependence, grounding, supervenience, and response-dependence ought to be explicated naturally looms large in the survey papers. However, to develop a full-fledged understanding of these conceptual tools, it also seems paramount to investigate how they relate to each other. In particular, as will be evident from many of the papers in this volume, we should arguably attach some importance to questions of relative priority as applied to these notions themselves. It may turn out, for instance, that some of these notions are conceptually more fundamental than others, and that the latter notions can be fruitfully understood in terms of the former.

The following brief introduction aims at giving a birds-eye view of some of the terrain that is more fully discussed in the five survey papers. It introduces some of the basic concepts, sketches some of the relevant examples and arguments, and it tries to emphasize some of the connections that arguably obtain between the debates on ontological dependence, grounding, supervenience, and response-dependence. The introduction closes with short abstracts of the research papers included in this collection.

1. Basic Topics

Witnessing a red round apple falling from a tree and hitting the ground, a thought occurred to Sir Isaac Newton. Since this is a collection, not on physics, but on *metaphysics*, we will not dwell on that thought. Instead, we will turn to more fundamental issues. Thus, consider not the theory of gravitation, but the abundance of things (and the abundance of sorts of things), that are implicated in the apple's fall. First, of course, there is the apple *itself* and its various *parts*; e.g. its skin, the part of the apple that started to turn brown as a result of the impact, and the elementary particles that the apple is made up of. Furthermore, there are the apple's various *features*; e.g. its roundness, its redness, and the configuration of particles in the apple's skin that make it reflect light in a certain way. Finally, there is the *event* of the apple's hitting the ground, the *fact* that it hit the ground, and (perhaps additionally) the true *proposition* that the apple hit the ground.

According to a time honoured view, not all these things are metaphysically on par. The idea is not simply that they are things of fundamentally different sorts—i.e. that they belong to different ontological categories. For, according to this view, metaphysics is not merely about determining the correct ontological categories and classifying things accordingly. It is also, and perhaps even more importantly, about determining relations of *metaphysical priority* that may or may not hold between members of the same as well as of different ontological categories. To put it somewhat differently, metaphysics is not simply concerned with the *furniture* of the world, but also with its *structure*.¹

Let us look more closely at our apple and consider its properties, say the apple's redness. First, note that the term 'the apple's redness' is ambiguous. Taken in one sense, it names a property that other objects could share with our apple; maybe there is another apple, still hanging in the tree, which is of exactly the same shade of red as the one that hit the ground. Talking about properties in this first sense is to talk about what philosophers have often called *universals*. In another sense, however, each of these equicoloured apples has its *own* redness—when you look at our apple, it is *its* colour that you see, not the colour of the apple in the tree. Talking about properties in this second sense is to talk about what philosophers have sometimes called *particularized properties*, or *accidents*, or *tropes*. Let us consider the apple's individual redness. Are there interesting metaphysical relations that hold between the apple and its redness?

It seems quite natural to suppose, and many philosophers through the ages have supposed, that there is an important *asymmetry* between the ontological status of the apple and its redness. First, the apple can change its colour—it once was green, it currently is red, and if no one picks it up and eats it, it will soon be brown. But when the apple was green, there was no such thing as the apple's redness. Thus, it seems that the apple can quite easily exist without its redness existing. How about the other way around, then? Could the apple's redness still be around once the apple is gone? This would seem to be a strange case—somewhat akin to Carroll's impossible Cheshire Cat,

¹ For a recent defence of this conception of metaphysics see Schaffer 2009.

who's smile supposedly survived the disappearance of the cat itself. Let us agree that this is indeed impossible: the apple's redness cannot exist unless the apple does.² Taken together, these two facts establish a significant metaphysical asymmetry between the apple and its redness: while the first may exist without the second, the second cannot exist without the first. Or, as philosophers are prone to say, the apple's redness is *ontologically dependent* upon the apple, but the apple does not *ontologically depend* on its redness.

What goes for the apple and its redness seems to go for other objects and their (particularized) properties as well—say, this pear's greenness or this strawberry's sweetness. Indeed, perhaps what goes for the apple and its redness will go for objects and their (particularized) properties *in general*. So here we have a first possible universal claim about the metaphysical structure of the world: *particularized properties ontologically depend on their bearers, but not vice versa*.

The notion of ontological dependence employed in the paragraph above is a purely *logico-modal* notion—whether *A* ontologically depends on *B* in this sense is settled solely by what could or could not be the case. Furthermore, this notion appeals to the modal status of the existence of a certain object vis-à-vis the existence of a certain (perhaps different) object. This notion of ontological dependence—sometimes dubbed *rigid existential necessary dependence*—is only one of many notions that have been developed under the title *ontological dependence*. The state of the art paper which opens this collection—Kathrin Koslicki's *Ontological Dependence: An Opinionated Survey*—investigates these different notions, the connections between them, and their historical importance.

Particularized properties are not alone in being plausibly taken to be, in this sense, dependent entities. Consider the final three entries on the above list of things a metaphysician may recognize when she sees an apple hit the ground: the *event* of the apple's hitting the ground, the *fact* that it hit the ground, and the true *proposition* that the apple hit

² Although this is quite a standard view, things may in fact be somewhat more complicated. For the apple's redness arguably is the redness of the apple's skin; but the apple's skin (and so its colour) can survive the apple (see Schnieder 2004).

the ground. Let us call the *event* of the apple's hitting the ground simply *apple-hit*. Just as in the case of a particularized property such as the apple's redness, it seems clear that the apple can exist at a certain time without *apple-hit* existing at that same time—after all, yesterday the apple was still peacefully hanging in the tree. Moreover, suppose that yesterday someone had picked our apple from the tree to make an apple pie—surely, that was quite possible. But in this case, the apple would *never* in fact have dropped and hit the ground. In this scenario, there is all the reason to say that *apple-hit* would never have occurred. If this is right, the apple does not ontologically depend on *apple-hit*, since the former could have existed without the latter (ever) existing.

What about the other direction? Could *apple-hit* have occurred even if the apple had not been around? Surely *some* event of *some* apple hitting the ground could have occurred even when our apple did not exist. But it does not seem farfetched that an event involving a certain object must involve *that very object*. *Apple-hit* is, after all, *this* apple's hitting the ground. If this is right, *apple-hit* does ontologically depend on the apple, since the former could not have existed without the latter (ever) existing. Taken together, these two considerations may draw us towards a second universal claim about the metaphysical structure of the world: *events ontologically depend on their participants, but not vice versa*. (Depending on your view of what events are, this may simply be a special case of the first claim involving particularized properties. Furthermore, depending on your preferred account of facts and propositions, similar claims may be put forth with respect to the remaining two entries on the above list.)

According to the two general ontological claims developed so far, the apple enjoys a fair amount of *independence*—it neither depends for its existence on its particularized properties, nor on the events in which it takes part. Clearly, if this is correct, what goes for the apple here will go for many other things as well—say, for this tree or this pear. Indeed, according to a traditional idea, we can exploit the relations of dependence and independence to delineate an ontological category of fundamental importance which includes the apple, this tree, and this pear, but not the apple's redness and the event of its hitting the ground—the category of (individual) *substances*. Roughly speaking, the

idea is that what sets substances apart from things of other kinds is that they are ontologically *independent*, while members of other categories are *dependent* entities. The second survey paper—Phil Corkum’s *Substance and Independence in Aristotle*—gives a thorough account of the historical roots of this idea and the different ways in which it may be implemented.

As I have done above, notions of ontological dependence have often been framed in purely modal terms. However, as is evident in both Koslicki’s and Corkum’s papers, philosophers have sometimes felt the need to go beyond purely modal resources. The motivation for this lies in the view that the distinctions that a modal account allows one to draw are too coarse grained to capture all relevant relations of metaphysical dependence and independence. Thus, consider once more the claim that particularized properties depend on their bearers while the bearers are independent of their particularized properties. Employing a modal notion of dependence, this seems to work fine for properties that can be lost or acquired. But let us assume, as seems natural, that not all properties are like that—perhaps the apple’s property of *being extended* (not being extended in a certain way, e.g. being round or being at least this big etc., but the property of being extended *at all*) is a property that the apple cannot live without. We then have a case where, given the modal account of ontological dependence, a particularized property and its bearer *both* ontologically depend on each other. Similarly, consider the following influential example from Fine (1995): Necessarily, Socrates exists if and only if the set which contains Socrates as its only member exists. Thus, according to the notion of ontological dependence appealed to above, each of these two objects ontologically depends on the other. However, as Fine argues, and many philosophers now agree, there is a metaphysically significant asymmetry between Socrates and {Socrates}—an asymmetry that cannot be accounted for by a purely modal approach.

In order to handle examples like these, we must bring conceptual resources to bear that allow for finer distinctions. In particular, some philosophers have appealed to a robust notion of *essence* in this connection, where the notion of an essence in this robust sense is not explicable in purely logico-modal terms (see Fine 1994). Thus, the

essence of an object is not, for instance, simply constituted by the properties that the object has necessarily, or those that it has necessarily if it exists etc. Employing such a notion of essence, we may claim that, while it is part of the essence of {Socrates} to have Socrates as its member, it is not part of Socrates' essence to be a member of that set. Others have employed *explanatory* vocabulary like 'in virtue of' or the connective 'because'. Thus, we may say that while {Socrates} exists *because* Socrates does, the reverse is not the case. In this way, it may be hoped, we can bring out the metaphysically significant asymmetry between e.g. Socrates and {Socrates}.

The contrast between attempts to capture dependence relations in purely modal terms and proposals that help themselves to richer conceptual resources can be felt throughout this collection. The attraction of sticking with purely logico-modal notions should be evident. While standard logical connectives like 'iff' or modal operators like 'necessarily' are quite well understood and, at least with today's tools, reasonably easy to handle, locutions such as 'because' and 'in virtue of', or talk of essences is surely a much more complicated matter. Indeed, some may consider these resources to be too messy and unreliable to trust them with heavy lifting in a philosophical theory. Thus, if we could dispense with these locutions in favour of logico-modal vocabulary, this should certainly be welcomed.

However, as a number of philosophers have pointed out, we should be wary of giving up on these locutions too early. For, as evidenced by the examples above, it is not at all clear that every relevant kind of dependence can be adequately captured in e.g. purely modal terms. Secondly, there may be a danger of overstating the obstacles that stand in the way of a sufficiently clear understanding of the suspect locutions and of thereby depriving ourselves of valuable resources. The point is well put by Gideon Rosen:

Philosophers are right to be fussy about the words they use, especially in metaphysics where bad vocabulary has been a source of grief down through the ages. But they can sometimes be too fussy, dismissing as 'unintelligible' or 'obscure' certain forms of language that are perfectly meaningful by ordinary standards and which may be of some real use.

So it is, I suggest, with certain idioms of metaphysical determination and dependence. We say that one class of facts *depends upon* or is *grounded in* another. We say that a thing possesses one property *in virtue of* possessing another, or that one proposition *makes* another true. These idioms are common [...] but they are not part of anyone's official vocabulary. The general tendency is to admit them for heuristic purposes, where the aim is to point the reader's nose in the direction of some philosophical thesis, but then to suppress them in favor of other, allegedly more hygienic formulations when the time comes to say *exactly* what we mean. [...] Against this tendency, I suggest that with a minimum of regimentation these metaphysical notions may be rendered clear enough, and that much is to be gained by incorporating them into our analytic tool kit. (Rosen 2010, 109f.)

It can hardly be denied that the tendency Rosen complains about has had a substantial impact. However, it also seems clear that its hold on metaphysics is fading, and has been fading for some time now. As indicated above, it has been challenged in the debate on ontological dependence. Modal accounts of truth-making have been confronted in a similar fashion.³ As we will see below, some would even prefer to explicate the notion of supervenience, often understood as a modal notion *par excellence*, in explanatory terms. Finally, in the past 10 years or so, several philosophers have argued that the concept of *response-dependence*, while typically framed in modal and epistemological terms, should be understood by appeal to *essences*.

Dethroning logico-modal notions opens the question of what could replace them as the central tool in metaphysics; or—putting it somewhat less dramatically, and perhaps more plausibly—what could serve as a fruitful supplement. One of the liveliest areas in current metaphysics addresses a notion that many of the participants in this debate would arguably consider to be up to the task—the notion of *metaphysical grounding*. As the third survey paper—Kelly Trogdon's *An Introduction to Grounding*—makes clear, participants in this debate are in large parts concerned with taking our 'idioms of metaphysical determination and dependence' seriously, and struggle to provide the kind

³ See, e.g., Restall 1996, Rodríguez-Pereyra 2006, or Schnieder 2006.

of regimentation that will render these metaphysical notions clear enough to be officially accepted as part of the philosopher's tool kit.

In order to show that the notion of grounding deserves such a prominent place, it seems that at least two things should be accomplished. First, it will be necessary to get a clear view of the notion of grounding itself. Apart from settling questions about the logical form of grounding-statements—e.g. should grounding talk be ultimately understood in terms of a relational *predicate* 'x grounds y', a *connective* such as 'p because q', or perhaps what we might call a *conedicate* like 'p in virtue of x'—a central part of this enterprise is to work out structural principles that govern grounding. If grounding is to be a helpful tool in describing the metaphysical structure of the world, it seems natural to suppose that it should have some characteristics of an ordering relation. As Trogdon points out, many authors accept that grounding is irreflexive, asymmetric and transitive; i.e. that grounding induces a strict partial ordering on its domain. This would be one important way in which grounding differs from e.g. the modal notion of ontological dependence employed above. However, these matters are currently hotly debated, and a consensus on the logical properties of grounding has yet to be reached.

A second interesting matter concerns the question of how the notion of grounding relates to other metaphysically significant notions. In particular, Trogdon discusses possible views about its connection to the concepts of *metaphysical modality* and *reduction*. If a fact grounds another fact, does this entail that the first fact *necessitates* the second? And does it entail that the second fact (and the entities involved in it) *reduces*, in any interesting sense, to the first fact (and the entities it involves)? Moreover, it seems worthwhile to investigate how the notion of grounding relates to the other notions that this collection is dedicated to, and that have been employed to describe the metaphysical structure of the world. One way in which the discussion of grounding remarkably differs from those of ontological dependence, supervenience, and response-dependence is that, while many authors take grounding to be a *primitive* notion, ontological dependence, supervenience, and response-dependence are virtually *always* considered to be definable in terms of other concepts. And while these notions have traditionally often been explicated in logico-modal terms, there is

now a growing tendency to appeal to the notion of metaphysical grounding instead. We have already seen what kinds of considerations motivate this in the case of ontological dependence. But we will soon find that similar considerations apply in other cases as well.

While the current discussion of metaphysical grounding is a very recent phenomenon, talk of *supervenience* has been around for a good 60 years now.⁴ Interest in the notion of supervenience, too, stems to a large part from the hope that it could be used to capture claims of metaphysical dependence. Consider again the apple and its colour. As the apple matured, it gradually turned from a certain shade of green first to a light red and finally to a deep red. Let us call specific shades of primary colours simply *shades*. It seems clear that there is an interesting asymmetry between *shades* of red and *red*—given that the apple has a specific shade of light red, this settles that it is red; however, the fact that the apple is red does *not* settle what specific shade of red it is (though, of course, it must be *some* specific shade of red). What goes for red here goes for primary colours in general. Thus, given that two objects are of the same shade, they must also have the same primary colour, while being of the same primary colour does not necessitate having an identical shade: primary colours *supervene* on shades, but shades do *not* *supervene* on primary colours.

Talk of supervenience is often introduced by employing modal vocabulary, as I have just done in the preceding paragraph. Roughly put, the idea is that A-properties (such as primary colours) supervene on B-properties (such as shades of colour) if and only if there cannot be a difference in the distribution of A-properties without a difference in the distribution of B-properties. This basic idea of supervenience can be cashed out in different ways, and much work has been done in past decades on defining precise notions. In his paper *Supervenience: A Survey*, Alex Steinberg takes us through various ways of doing so, and investigates the logical relationships between the resulting concepts.

⁴ The basic idea of grounding, however, is much older and has been discussed throughout the history of Western philosophy. And while this happened often at a much less detailed and explicit level than in the current debate, Bernard Bolzano's (1837) theory of grounding is an important exception which anticipated numerous aspects of the current debate. For some remarks on the history of grounding, see Correia and Schnieder 2012b.

Standard accounts of supervenience reflect the fact that supervenience is typically taken to be a modal notion. As Steinberg points out, however, we may be interested in giving a stronger account of supervenience. For, again, just as in the case of the modal notion of ontological dependence introduced above, modal notions of supervenience do not seem to be suited to capture all relevant relations of dependence and independence.

Let me adapt one example from Steinberg's discussion to briefly illustrate the point. Let *RED*, *ROUND*, \neg *RED*, and \neg *ROUND* be, respectively, the properties of being red, round, not red, and not round. Finally, consider those properties that, loosely speaking, can be constructed from these by conjunction—e.g. the property of being *both* red and round, of being red and not round, etc. Intuitively, it seems that there is a relevant asymmetry between the conjunctive properties on the one hand, and the simpler properties on the other. If we want to put this in terms of supervenience, we may be tempted to say: the conjunctive properties supervene on these simpler properties, but the simpler properties do not supervene on the conjunctive ones. However, on the modal understanding employed above, the conjunctive properties and the simpler properties can easily be seen to be on par. After all, it is necessary that two objects are exactly alike with respect to the simpler properties *if and only if* they are exactly alike with respect to the conjunctive properties. Thus, given a modal account, the conjunctive properties and the simpler properties mutually supervene on each other.

Steinberg argues that, if we want to employ a notion of supervenience in formulating claims of metaphysical priority and posteriority, we need to go beyond modal resources. Following Correia 2005, he suggests drawing on the explanatory notion of *grounding* in order to develop a notion of supervenience that has the desired properties. Such a notion would arguably be a fruitful addition to the more standard modal notions of supervenience that have so far been at the centre of attention.

We have now come across the conceptual resources that allow us to formulate several interesting claims about certain parts of the metaphysical structure. First, the claim that a substance like the apple is *ontologically prior* to its particularized properties, say its redness and its

roundness; while the latter ontologically depend on (or are grounded in) the former, the former does not so depend on the latter. Second, both the apple's redness and its roundness are plausibly taken to be *supervenient* properties (both in a modal sense, and on a more ambitious account in terms of grounding)—they are (modally) grounded in more fundamental properties, e.g. the arrangement of particles of (a specific part of) the apple.

In these two regards, the apple's redness and its roundness are thus metaphysically on par. However, philosophers have long felt the need to make further metaphysical distinctions among properties with respect to the dependence relations they enter into. Thus, according to a classical view, while some properties of the apple are had *independently* of any observers, others are had only *in virtue of* standing in some relation to (possible) perceivers.

The first category was typically thought to comprise features such as being solid, being round, and being at rest, while properties such as being red, being sweet, and having a fruity smell were considered to belong to the second category. Under the heading of *primary* as opposed to *secondary qualities*, this distinction is famously associated with John Locke. Very roughly put, a *secondary quality* of a certain object was thought to consist in its *power to produce certain sensations in us*, while, in contrast, its *primary qualities* were taken *not* to consist in a power to affect us in certain ways (although they might typically go hand in hand with such powers). Classifying redness as a secondary quality in this sense allows us to combine a realist view of colours—some things are really red, and they would have been red even if we had not been around—with the view that, nevertheless, whether an object is red is not wholly independent of our 'cognitive or affective responses' (Johnston 1989, 144).

In more recent times, the attempt to clarify and generalize the underlying idea of the primary / secondary quality distinction has received much attention under the label of *response-dependence*. In *Different Notions of Response-Dependence*, the final of the five survey papers of this collection, Jussi Haukioja gives an overview of this debate. Initially, the question took centre stage of whether the notion of a (moral) *value* could fruitfully be construed as response-dependent. But the option of combining a modest form of mind-dependence with mod-

erate realism made it attractive to apply this idea more broadly. Thus, soon the prospects of applying the notion of response-dependence to many other important concepts and properties were widely discussed.

While qualities in Locke's sense are most naturally thought of as *properties*, the term 'response-dependence' was initially introduced to apply to *concepts*. Thus, Johnston (1989, 145) suggested calling concepts response-dependent if they 'exhibit a conceptual dependence on or interdependence with concepts of our responses in certain specified conditions.' Johnston acknowledged that the relevant notion of dependence is in need of clarification. However, Johnston in particular emphasized the importance of certain *a priori* biconditionals. A response-dependent concept *F*-ness, Johnston claims, will support an *a priori* biconditional of the form '*x* is *F* iff *x* is disposed to produce response *R* in subjects *S* under conditions *C*.' For example, given that the concept of redness is response-dependent, it will be *a priori* that something is red iff it is disposed to produce red-sensations in standard observers under standard conditions.

As Haukioja points out, several, non-equivalent accounts of response-dependence have been proposed in the literature. However, one thing that is common to the standard accounts is that, in giving their official proposals, they shy away from using the explanatory locutions that seem to be essential to the examples via which response-dependence is typically introduced. Rather, they stick to logico-modal vocabulary (supplemented by the epistemic notion of *a priori* knowledge). We may suspect, therefore, that the debate on response-dependence has, at least to a certain extent, fallen prey to the tendency Rosen complains about in the passage cited above. And as in the cases of ontological dependence and supervenience, it could be argued that this generates certain problems. For, as has been noted in the literature, it seems questionable whether an account of response-dependence along these lines can serve to bring out the intended contrasts (for this and the following, see e.g. Wedgewood 1998, García-Carpintero 2007, López de Sa 2010).

Take, for instance, the concept of roundness and consider the following biconditional: $\forall x (x \text{ is round iff } x \text{ is disposed to look round to perceptually normal humans in normal conditions})$. Or, to put it less

cumbersome: round things appear round to normal perceivers under normal conditions. This is surely true. Moreover, the argument goes, the biconditional is also *a priori*, since the right hand side simply states conceptual material that fixes the application conditions for the predicate ‘is round’. Hence the concept of roundness, which was meant to contrast with response-dependent concepts like redness, *does* turn out to satisfy the account. Demanding that there are biconditionals that are *necessary* in addition to being *a priori* is arguably not enough to salvage the account, for we can turn the relevant biconditional into a necessary truth by rigidifying the reference to subjects and conditions.

The structure of these considerations will by now be all too familiar. It should thus not be surprising that it has been suggested to appeal to richer conceptual resources in order to do justice to all the contrasts we wish to capture. For a proposal of how the problem just sketched may be circumvented by appealing to *essences*, see e.g. López de Sa’s contribution to this volume. And without going into too much detail, we can easily see how framing response-dependence in *explanatory* terms may also supply a way of dealing with the problem indicated. While the pertinent biconditional for the concept of roundness is arguably *a priori*, notice that a corresponding ‘because’-sentence such as ‘Round things are round because they are disposed to look round to perceptually normal humans in normal conditions’ is not only not *a priori*, it is not even true: a round thing’s being round in no sense *results from* or *is explained by* its disposition to appear as anything. On the other hand, proponents of a response-dependent account of, e.g., colours should be happy to accept that a corresponding explanatory statement for the concept of redness *does* seem to be true. After all, such explanatory statements simply give voice to the motivation for classifying colours as response-dependent in the first place.

We have now acquainted ourselves with some of the issues that surround the four notions of ontological dependence, grounding, supervenience, and response-dependence. We have briefly touched on the question of how these notions can be explicated, and to what use they may be put. One theme that emerged from these considerations is surely the following—that, without going beyond the conceptual resources provided by purely logico-modal notions, the prospect for capturing all relations of dependence and independence that have

been of interest to philosophers seems dim. Fortunately, in 2012, this is not as daring (or as original) a claim as it would have been 20 years ago. By now, much impressive work has been done on regimenting notions that can supplement the tools of modal metaphysics. The wealth of problems that arise when one is confined to the logico-modal toolbox, and the way in which everything seems to fall into place once one helps oneself to a notion of grounding, or a robust notion of essence, suggests that there must be something right about the direction metaphysics is currently taking.

2. Abstracts of Research Papers

The basic topics and questions introduced above will be significantly elaborated in the five survey papers that form the first part of this collection. These surveys provide comprehensive overviews of the state of the art of the debate on the notions of ontological dependence, grounding, supervenience, and response dependence. Moreover, in discussing the *locus classicus* of attempts to define the notion of *substance* in terms of independence, Phil Corkum's survey paper gives an in-depth investigation of one of the earliest accounts that put dependence-notions to philosophical work.

We will end this introductory chapter with brief abstracts of the research papers. These papers and the debates to which they contribute bear testimony to the fact that, their age notwithstanding, these topics remain very much alive and kicking. Varieties of notions of metaphysical dependence, it seems to us, are bound to keep playing a central role in metaphysics and beyond.

1. J. Lowe: *Some Varieties of Metaphysical Dependence*

In *Some Varieties of Metaphysical Dependence*, Jonathan Lowe defines various notions of ontological dependence, motivating these definitions by appeal to examples. Lowe identifies three types of necessary dependence—rigid existential dependence, generic existential dependence, and identity-dependence—and three corresponding types of essential dependence. In addition, Lowe defines the further notion of accidental existential dependence in terms of the notions of rigid and generic existential dependence. Lowe considers the claim that these definitions can collectively satisfy all our needs in metaphysics

where any notion of ontological dependence is called upon. Lowe explains why we sometimes need to call upon notions of essential dependence which are stronger than the corresponding notions of necessary dependence, and he explains how he understands the notion of essence and its relation to modal notions like that of necessity. Next, Lowe defends one of his proposed definitions—that of essential identity-dependence—in response to some important objections that have been raised against earlier treatments of this notion. Finally, Lowe argues that a similar approach to the one that he adopts with regard to ontological dependence can be applied in the theory of truthmaking, by offering an account of the truthmaking relation which defines it in terms of a type of essential dependence. Lowe explains why he thinks that this approach is preferable to one which treats the truthmaking relation as primitive and to ones which define it in terms of a primitive notion of ‘grounding’, expressible by undefined locutions such as ‘because’ or ‘in virtue of’.

2. *Carrie Jenkins - Explanation and Fundamentality*

Carrie Jenkins’ paper *Explanation and Fundamentality* explores a hypothesis about what metaphysicians are doing when they talk about fundamentality and dependence. The hypothesis is that when metaphysicians describe something as ‘fundamental’, that means approximately the same in their mouths as if they had called it ‘(part of) that by appeal to which all the rest can be explained’. Correspondingly, the hypothesis continues, ‘ x metaphysically depends upon y ’ and other cognate phrases are to be understood as expressing roughly the same thing as ‘(salient things about) x can be explained by appeal to y ’. Jenkins considers a range of pros and cons for this hypothesis. On the pro side, she discusses how the hypothesis can render ‘fundamentality’-talk and ‘dependence’-talk unmysterious, and make good sense of its intimate associations (both explicit and implicit) with explanation in the work of contemporary metaphysicians. On the con side, Jenkins considers the objection that the hypothesis unduly deflates substantive metaphysical notions, and construes them in an inappropriately humanocentric fashion.

3. *Louis deRosset - No Free Lunch*

A familiar and plausible view holds that reality comes in layers: at the bottom are (perhaps) the physical entities. Higher up, we find chemical, biological, geological, psychological, sociological, economic, etc., entities: molecules, human beings, diamonds, mental states, nations, interest rates, and so on. On this view, the higher-level entities are ‘an ontological free lunch’, because their existence and features are completely explicable in terms of the existence and features of lower-level entities. In this sense, higher-level entities are ‘nothing over and above’ lower-level entities. In his paper *No Free Lunch*, Louis deRosset argues that this layered conception of reality faces a problem: barring reduction, every entity is fundamental, in the sense that some of its features are explanatorily basic.

4. *Fabrice Correia - Metaphysical Grounds and Essence*

Essence and metaphysical grounding are taken by many philosophers to be central metaphysical concepts. How are these two notions connected? Can one of them be defined in terms of the other? Alternatively, can they both be understood in terms of a third, more basic notion? In his paper *Metaphysical Grounds and Essence*, Fabrice Correia tentatively defends a reduction of metaphysical grounding to essence, by arguing that certain accounts of the former notion in terms of the latter are both plausible and immune to certain objections. One such account, which has the virtue of being very simple, says that for a fact f to be grounded in other facts g, h, \dots is for it to be the case that the following conjunction holds: g, h, \dots all obtain and it is part of the essence of f that it obtains if g, h, \dots all obtain.

5. *Stefano Caputo - The Dependence of Truth on Being: Is There a Problem for Minimalism?*

The aim of Stefano Caputo’s paper *The Dependence of Truth on Being: Is There a Problem for Minimalism?* is to show how to accommodate a minimalist account of truth with the view that truth is grounded in how things are. After explicating the relevant grounding claim in terms of explanatory statements of the form ‘if it is true that p , then ((it is true that p) because p)’, Caputo considers an attempt at bringing the two views into conflict. In a nutshell, the argument for incompatibility

goes as follows: if the grounding claim is correct, then that is an essential fact about truth and should therefore be entailed by a correct account of truth. But a minimalist account of truth is too weak to entail any such grounding claim. Thus, the two views are incompatible. In response, Caputo argues that the minimalist should resist the temptation to deny the correctness of the grounding claim, instead questioning the assumption that an account of truth *by itself* has to entail the grounding claim. For the grounding claim, while indeed expressing a central fact about truth, also involves the concept of explanation. Caputo then shows that, once minimalism is supplemented with an appropriate account of the pertinent kind of explanation, the grounding claim follows.

6. *Stephan Leuenberger - Supervenience Among Classes of Relations*

In his paper *Supervenience Among Classes of Relations*, Stephan Leuenberger extends the definition of strong supervenience to cover classes of relations of any adicity, including transworld relations. Leuenberger motivates this project by showing that not all interesting supervenience claims involving relations are global supervenience claims. The proposed definition has five welcome features: it reduces to the familiar definition in the special case where the classes contain only monadic properties; it equips supervenience with the expected formal properties, such as transitivity and monotonicity; it entails that a relation supervenes on its converse; it classifies certain paradigms correctly; it makes distinctions even in the realm of the non-contingent, as witnessed by the fact that identity does not supervene on any class of relations. Finally, the paper applies the defined concept, and the related concept of *orthogonality*, to the study of internal and external relations.

7. *Ralf Bader - Multiple-Domain Supervenience for Non-Classical Mereologies*

Ralf Bader's paper *Multiple-Domain Supervenience for Non-Classical Mereologies* develops co-ordinated multiple-domain supervenience relations to model determination and dependence relations between complex entities and their constituents by appealing to R-related pairs and by making use of associated isomorphisms. Supervenience relations are devised for order-sensitive and repetition-sensitive mereologies, for

mereological systems that make room for many-many composition relations, as well as for hierarchical mereologies that incorporate compositional and hylomorphic structure. Finally, mappings are provided for theories that consider wholes to be prior to their parts.

8. *Eline Busck Gundersen - Response-Dependence and Conditional Fallacy Problems*

In *Response-Dependence and Conditional Fallacy Problems*, Eline Busck Gundersen discusses a particular problem for response-dependence theses as they are traditionally formulated: their vulnerability to conditional fallacy type counterexamples. A range of solutions from the literature are discussed, including Johnston's replacement of subjunctive conditionals with explicitly dispositional formulations, Blackburn's 'elasticity' approach, and Wright's provisoed biconditionals. Gundersen puts forward a new suggestion: the suggestion that understanding the 'favourable conditions' appealed to in response-dependence accounts in a more relative way than has usually been assumed will help response-dependence theorists in the face of conditional fallacy problems. By further exploring this line, possibly in combination with one of the other approaches, the paper argues, the challenge to response-dependence accounts provided by conditional fallacy problems can be met.

9. *Dan López de Sa - Rigid vs. Flexible Response-Dependent Properties*

Response-dependence was intended to generalize the notion of a secondary quality. In particular, by also applying to values, it aimed to vindicate realism about them. In his paper *Rigid vs. Flexible Response-Dependent Properties*, Dan López de Sa argues that response-dependence, by itself, fails with respect to this project. According to López de Sa, there is a general notion of a response-dependent property under which both secondary qualities and evaluative properties—but not all properties—fall. However, López de Sa argues, since response-dependent properties in this general sense comprise both *rigid* and *flexible* properties., the claim that a property is response-dependent in this sense does not vindicate realism concerning the property in question. .

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