

Grounding, Causation, Parthood

“How things are”, graduate course, spring term 2011
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Determination, grounding and priority

In the semantic field of fundamentality, priority, grounding and determination, three different questions have to be distinguished:

1. What grounds what? If something is grounded in something else, it is a *manifestation* of the latter, an *aspect* of it, perhaps an *abstraction* of it. It is natural to take manifestations of other things to be “less objective” than them, “less substantial”, and it is a natural thought that these entities of a “lesser sort” do not *really* exist, that our ontological commitment is only to what grounds them, especially if “metaphysical reality is to be identified with what is “objective” or “factual”” (Fine 2001: 3).
2. What determines what? If $a / F / a$'s being F determines $b / G / b$'s being G either qualitatively, essentially or existentially, the first relatum is *responsible* for the second being such-and-such, being the thing it is, being. It is so responsible because it *makes* it so. In this sense, we may say that particulars are determined by the universals they exemplify, boundaries are determined by what they are boundaries of, tropes are determined by their bearers. Even someone may restrict our notion of metaphysical reality to “what is “irreducible” or “fundamental”” (Fine 2001: 3), saying that some entities are determined by others *presupposes*, rather than does away with, the claim that they exist.

Distinguishing the questions of grounding (what Fine (2001: 4) calls “factuality”) from questions of determination (“reduction”), allows for four cases. On the assumptions that both physicalism (there are no fundamental mental facts) and expressivism (moral discourse is not fact-stating) are true, and using “grounded” for “either grounded or fundamental” (the fundamental can be taken to ground itself) we get:

	determined	undetermined
ungrounded	moral facts	centaurs, unicorns
grounded	psychological facts	elementary particles

The main difference between grounding and existential determination is in its metaphorical ‘direction’. Existential determination, in my – though not Fine’s – use of the term, is a vertical relation, as it were, structuring reality and non-reality in different layers, that are more or less fundamental. The physicalist says that psychological facts are determined by physical facts, but may still believe that they are real: it is just that he does not believe they are fundamental.

Grounding, on the other, may hold horizontally, among equally fundamental things. The expressivist who believes that this baby’s being tortured being morally wrong is grounded in what moral sentiments we should have with respect to it does not have to claim that our moral sentiments *determine* the wrongness of the torturing. While he may be happy to hold that “torturing this baby is wrong because we should disapprove of it”, he is not committed to “torturing this baby is wrong because of our disapproving of it” – his quest is about the status of the *truth* itself, not about its truthmaker. Grounding is metaphysically neutral in this sense.¹

¹Fine (2001: 15) says someone claiming that conjunctive facts are grounded in their conjuncts may be adopting “a metaphysically neutral stand on whether there really are conjunctive facts”.

Even though Fine (2001) carefully distinguishes the questions of grounding and determination/fundamentality, he holds that questions of factuality reduce to questions of fundamentality, because he assumes that the disagreement between a factualist and a non-factualist about some proposition concerns the factuality of some constituent of that proposition – a notion that is defined in terms of the factuality of all the propositions in which the constituent (a particular or property) has ‘primary employment’. It seems to me that there is *another* notion of fundamentality of ‘constituents’ that is not derivative from the status of propositions in which they occur. It is in terms of this other notion, it seems to me, that the physicalist about the mental (contrary to the expressivist about the moral) frames his thesis. On this, not Fine’s understanding, of “fundamental”, Fine’s principle (g) is false:

[W]henver a constituent occurs in a true basic factual proposition and also occurs essentially in some true factual proposition, then any ground for the latter must contain the constituent. (Fine 2001: 18)

Fine justifies this principle in terms of his notion of “fundamentality” as follows:

If a given constituent *C* occurs in a true basic factual proposition then it must be a fundamental element of reality. But if some true factual proposition contains *C* essentially, it must be true in virtue of some feature of *C*. But given that *C* is a fundamental element of reality, this feature of *C* cannot be grounded in something that did not involve *C*. (Fine 2001: 21)

I disagree with the second sentence of this quote: It does not follow from a proposition’s being factual that it wears its truthmaker on its sleeve, as it were. “Socrates exemplifies redness”, for example, may well be true, factual, and contain “exemplifies” essentially.² But it does not follow, on my understanding of fundamentality, that “Socrates exemplifies redness” cannot be grounded in “Socrates is red”.³

Distinguishing the two notions, and the two correlative notions of metaphysical explanation, I thus disagree with Fine (2001: 22) that “in providing the ground for a given proposition, one is explaining, in the most metaphysically satisfying manner, what it is that makes it true”. The question of truthmakers is a question of determination, of what *determines* the truth-value of the truth-bearer in question. If *a* makes it true that *p*, and if *p* grounds *q*, then *a* will also make it true that *q* – but this is not to say that the statement that *p* grounds *q* *already* settles the question what truthmaker “*q*” has, or indeed the question whether it has any truthmaker (is true).

Fine’s notion of reduction presupposes that what is reduced is not real, but I do not see why we could not have reduction among the real as well. Fine (2001: 26) explicates his notion of reduction in terms of closeness to reality:

...a necessary condition for the proposition *P* to reduce to the propositions *Q*, *R*, ...is for it to be grounded in those other propositions; and a necessary and sufficient condition for *Q*, *R*, ...to be closer to reality than *P* is such a case is that *P* be unreal and each of *Q*, *R*, ...either be real or “en route” to what is real. But the latter is presumably just a matter of the proposition’s being grounded in what is real. (Fine 2001: 26)

²Fine (2001: 18) defines the notion of essential containment of a constituent as follows: “Say that a proposition *essentially* contains a given constituent if its replacement by some other constituent induces a shift in truth-value.” Even if “Socrates exemplifies redness” is true, “Socrates hates redness” may still be false.

³A related criticism, using the same example, has been made by Paul Horwich (2007: 8). Fine (2007: 18) replies that the ‘holistic’ elimination procedures of which this is a special case only apply to non-factual constituents and so apply *because* these are non-factual. But this simply begs the question against someone who thinks that pleonastic entities may be essential constituents of factual discourse.

Priority monism

What's the thesis?

Parthood-is-priority (PP) is the thesis that (i) for all x , if y is a part of x , then y ontologically depends on x and that (ii) there is a sum of everything. Coupled with some composition principles, PP entails Priority Monism (PM), that everything ontologically depends on Porky the Pig, the thing of which everything is a part.

A possible equivocation?

In particular I will assume that there is a world and that it has proper parts. More precisely, I assume that there is a maximal actual concrete object – the cosmos – of which all actual concrete objects are parts. I should stress that I am only concerned with actual concrete objects. Possibilia, abstracta, and actual concreta in categories other than object are not my concern (deities and spirits, if such there be, are not my concern either). When I speak of the world – and defend the monistic thesis that the whole is prior to its parts – I am speaking of the material cosmos and its planets, pebbles, particles, and other proper parts. (Schaffer 2010: 33)

...given the foundationalist assumption of a well-founded partial dependence ordering [...], Monism is equivalent to the thesis that every proper part of the cosmos depends on the cosmos. Suppose that Monism holds. Given well-foundedness, every actual concrete object must be either basic or dependent on some basic object. By the definition of Monism, the cosmos is the only such basis. So every proper part of the cosmos must depend on the cosmos. In the other direction, suppose that every proper part of the cosmos depends on the cosmos. By the asymmetry of dependence, the cosmos cannot then depend on any of its proper parts. By irreflexivity the cosmos cannot depend on itself. So the cosmos must be basic. Moreover nothing else can be basic since by supposition everything else is dependent on the cosmos. So there can be one and only one basic actual concrete object, namely the cosmos. (Schaffer 2010: 42–43)

Depending on whether we read “the cosmos” as a proper name or a definite description, Monism is one or rather a family of theses.

Schaffer's problem: Porky only does the job *given* it's everything.

An analogous argument?

“Let ‘ B ’ be a name (rigid designator) of a table, let ‘ A ’ name the piece of wood from which it actually came. Let ‘ C ’ name another piece of wood. Then suppose B were made from A , as in the actual world, but also another table D were simultaneously made from C . (We assume that there is no relation between A and C which makes the possibility of making a table from one dependent on the possibility of making a table from the other.) Now in this situation $B \neq D$; hence, even if D were made by itself, and no table were made from A , D would not be B .” (Kripke 1980: 114, fn. 56)

(R-1) Suppose it is possible that B is not made out of this hunk of wood.

(R-2) Then it is possible that B and the table made out of this hunk of wood are different.

(R-3) By the necessity of distinctness, then they are actually different.

(R-4) But B is actually the table made out of this hunk of wood.

The step from (R-1) and (R-2) may be granted provided that necessarily, only one table is made out of this hunk of wood, so that “the table made out of this wood” has a unique reference in the possibility envisaged in (R-2). It is the step from (R-2) and (R-3) which is problematic, for it requires that “the table made out of this wood” not only has a referent in the possibility envisaged, but that it has the same reference than it actually has, i.e. is a rigid designator.

It is because the step from (R-2) to (R-3) amounts to the assumption that “the other table that would be made out of this wood” is a rigid designator, that Kripke’s famous “proof” shows at best the essentiality, but not the necessity of origin: while we may be in agreement with Kripke that the counterfactual table made out of this very same block of wood would be a different kind of thing, i.e. would differ in essence from the table that is in fact made out of this wood, their necessary distinctness follows only under the assumption of the necessity of the modal account: it is only if we restrict admissible counterpart relations by essential properties that we can draw the further conclusion that it is metaphysically impossible for *B* to be this different table made out of this very same hunk of wood.

Arguments against

Argument from mereological non-essentialism. If *a* has *b* as its part, but inessentially so, *a* could exist in the absence of *b*. Porky could exist without me. So fixing the whole does not fix the parts.

Argument from change. Change is ultimately change in basic things. Porky cannot change. But there is change. So other things than Porky must be basic.

Argument from explanation. Like Porky has everything as its parts, Pope, the maximal proposition, is every truth as one of its conjuncts. Shall we say that Pope *explains* all the truths? No, because an argument from Pope to any of its conjuncts cannot transmit warrant.

Parthood as a type of grounding

Parthood is another very important kind of existential determination. This was clearly seen by Kim, discussing dependency or determinative relationships “in virtue of [which] the world can be made intelligible”:

The part-whole relation is also important: however, its importance seems to derive largely from the belief that many crucial aspects of a whole including its existence and nature are dependent on those of its parts. (Kim 1984: 54)

Mereology is the logic of the part/whole relation.⁴ As a kind of logic, it applies to everything. It thus makes sense, for any *x* and *y*, to ask whether *x* is part of *y*. Mereology deals with whatever we like to call a “thing”, an “entity” or an “object”, that is it deals with everything:

As a formal theory, mereology is simply an attempt to set out the general principles underlying the relationships between a whole and its constituent parts, just like set theory is an attempt to set out the principles underlying the relationships between a class and its constituent members. (Varzi 1996: 2)

⁴“Mereology” sometimes also denotes the broader set of activities and questions relating to matters of parts and wholes. “Logic” has the same kind of ambiguity, sometimes mitigated by the use of an indefinite article.

Mereology comes with its own set of logical truths, e.g. “The part is not greater than the whole” (cf. Jackson 1979: 5). Like for logic in general, it does not matter whether the objects of mereology are extended in time. For now, I will take “particular” to mean particulars-at-an-instant- t_0 . Equivalently, I could construe parthood as a three-place relation, taking instants as its third argument. What makes anything a mereological part is the following principle:

1 (Unrestricted Composition). *If there are some things, they have a mereological fusion.*

The mereological fusion of some things is the least thing of which they all are parts or, equivalently, the least thing that overlaps anything that overlaps them. I understand (1) as a *logical* thesis, asserting, for any number of parts, that there is *some* thing which is the fusion of them, without thereby claiming anything substantial about the nature of this object. Most importantly, (1) leaves open its identity and existence conditions. The question whether, e.g., a fusion of particulars is itself a particular or when and where it does exist, is a question pertaining not to logic but to metaphysics. All we can get from (1) is that there *is* a fusion, whatever it is. If we understand “if” in (1) as “whenever”, i.e. as quantifying over temporal instants, we understand it as asserting the existence of a compound; if we understand it atemporally, we postulate the existence of an aggregate.⁵

A second important principle is “Uniqueness of Composition”:⁶

2 (Uniqueness of Composition). *Only one whole is composed of some given parts.*⁷

Only one (actual) whole is composed of some given (actual) parts. Of all the different ways in which some parts could form a whole, at most one is actual. By these principles, fusion, which I denote by “ \oplus ”, is total and functional. I take (2) to mean that of all the different ways in which some parts can form a whole, at most one is actual, i.e. the way the parts actually combined to form the whole. This does not rule out that counterparts of some given parts may form a whole in another possible world which fails to be a counterpart of their whole in the actual world.

I understand (2) in the following way: the same (qualitatively identical) parts give us only (numerically) one whole; no numerical difference between wholes without qualitative difference of parts. This is a strong form of a supervenience thesis, entailing its weaker cousin, i.e. the claim that the properties of a whole supervene on the properties of its parts.⁸ If we were to join (2) with its (stronger) converse, i.e. “no numerical difference between parts without qualitative difference of their wholes”, we would indeed get something like “Composition as Identity”.⁹

The main argument for (2) is that it is difficult to see what could violate it. What about the ‘mode of composition’? The fusion of some parts may, of course, have various properties, empirical, non-empirical and structural ones (like *being composed in such-and-such a way*). It could have lacked these

⁵The distinction is the one of Fine (1994: 137), who distinguishes two non-structural modes of composition, namely aggregation and compounding, semi-formally as follows: Aggregation (+) is any non-structural mode of composition satisfying the following: (1) $a + a = a$, (2) $a + (b + c) = (a + b) + c$ and (3) $a + b$ exists at $t \leftrightarrow a$ or b exists at t . Compounding (\times) is any non-structural mode of composition satisfying the first two conditions above and the following in place of the third: (3') $a \times b$ exists at $t \leftrightarrow a$ and b exist at t .

⁶We work in the following with what Simons (1987: 28) calls ‘Minimal Extensional Mereology’. (2) is equivalent to Simons’ “Proper Parts Principle”.

⁷Uniqueness of composition is not to be mistaken for uniqueness of decomposition, i.e. the claim that wholes are uniquely decomposable into a definite number of parts. All that follows from (2) is that decomposition into *simple* (i.e. mereologically atomic) parts is, if possible, unique. (2) ensures that the mereology employed in the following is ‘extensional’ in the sense of Simons.

⁸Suppose we have two qualitatively different wholes, x and y . By the indiscernibility of identicals, they will be not numerically distinct. Thus they are composed of qualitatively different parts.

⁹I disagree with Armstrong’s claim that symmetrical supervenience *ipso facto* is identity, for this claim seems to imply (??), which he rejects. Many stories used to illustrate the contingency of (??) describe scenarios in which it would be necessarily true (by a law of nature say) that two things are indistinguishable. Then all properties of the one would supervene on the other and vice versa, without the two things thereby being identical. The stronger kind of supervenience in (2), however, yields numerical and (not only) qualitative identity.

parts, i.e. it could have been composed in different ways than it actually is.¹⁰ This is, however, not yet to say that the absence of such properties would make for a (numerically) different whole. Even if we accept modes of composition and admit that one whole could have been formed out of its parts in different ways, this is not yet to admit that different wholes could have been (and thus *are*, according to (i)) formed out of the same parts. To get this stronger claim we would have to adopt a strong form of mereological essentialism, that the mode of composition is an essential property of any whole *and* that it is an essential property of some given parts to be parts of a whole composed in such a way. Even if the first half may perhaps be true,¹¹ the second is certainly false.

(i) is held to be ontologically acceptable because any given whole supervenes on the arrangement of its parts, because mereology is, in other words, ‘ontologically innocent’:

3 (Ontological innocence of mereology). *Fusions are nothing over and above the parts they are composed of.*¹²

One main argument for the acceptability of (i) (Armstrong 1997: 12–13) is that it does not multiply entities beyond necessity. The argument has two steps: the first step is the thesis that mereological fusions supervene on their parts.¹³ The second step is the thesis (which Armstrong (1997: 12,45) calls “the doctrine of the ontological free lunch”) that supervenient entities are no addition to the ontology of a philosophical theory. The second step is entailed by the first if we understand “possible world” in the Armstrongian, combinatorialist sense.¹⁴ But not only is the combinatorial theory highly problematic (cf. p. ?? et seq.), but the “doctrine of the ontological free lunch” is clearly unacceptable (cf. p. ??). To assess the plausibility of (i) we need a less committal formulation of the alleged ontological innocence of mereology.

One way to interpret (3) as a supervenience thesis is to take it as equivalent with “ \Box (i)”, the claim that, necessarily, if there are some things, they have a fusion. Lewis formulates the thesis in terms of redundancy of ontological commitments: if you’re committed to some things, you’re also committed to their fusion, but this latter commitment is redundant given the first (1991: 81). Its redundancy stems from the fact that you’re committed to “portions of Reality” and not to items under a given scheme of counting them. By accepting fusions, you’re committed to the same thing (counted as one) you already were committed to (when it was counted as many). Lewis calls this latter claim “Composition as Identity”:

It is in virtue of this thesis that mereology is ontologically innocent: it commits us only to things that are identical, so to speak, to what we were committed before. (Lewis 1991: 82)

¹⁰This is why I included the actuality conditions. More general, I understand (2) to apply only within *one* world.

¹¹We will, however, later see reasons to reject even weak mereological essentialism.

¹²I am speaking metaphorically because I do not want to commit myself to some particular version of supervenience applied to entities. What matters is only that fusions are not ontologically costly, with respect to some reasonable way of setting ontological prices.

¹³Armstrong defines supervenience as a species of ontological dependence: *S supervenes on R* iff there exist possible worlds which contain an entity or entities *R* and if in each such world there exists an entity or entities *S* (Armstrong 1989: 103), see also Armstrong (1997: 45)).

¹⁴A (combinatorially) merely possible state of affairs is a state of affairs stated by a false atomic statement (Armstrong 1989: 46). Possible worlds are those conjunctions of possible states of affairs in which every individual, property or relation is used and all individuals are ascribed at least one simple property (Armstrong 1989: 47–48). Armstrong (1989: 49,69,116) (cf. also Armstrong (1997: 1)) presupposes that all simple and relatively simple (wholly distinct) properties and relations are compossible: If *A* and *B* are wholly distinct existences, then it is possible for *A* to exist while no part of *B* does (and vice versa). From this it follows that “where there is supervenience, there the entities involved are not wholly distinct.” (Armstrong 1989: 104) Symmetrical supervenience, as it holds between wholes and their parts, collapses into identity (Armstrong 1989: 84), Armstrong (1997: 12,46)).

It is important to think of “Composition as Identity” as an *explanation* of (3). Even if the analogy between composition and identity is looser than it seemed to Lewis, mereology may still be ontologically innocent.

Recently, Byeong-uk Yi (1999: 146) has given an argument against “Composition as Identity” (take a and b to be some particulars and c their fusion): (i) c is one of c ; (ii) c is not one of a and b ; therefore, (iii) a and b are not identical with c . Yi justifies (ii) on the grounds that something is one of a and b iff it is identical with either a or b and that c is identical with neither a nor b .¹⁵ For (i)-(iii) to be an argument against the “Composition as identity” thesis, “and” in (iii) must be read as denoting mereological composition. The same reading, however, turns (ii) into the negation of (i) and makes the argument beg the question. If “and” in (iii) is understood in a nonmereological way, it is just trivially true and does nothing to destroy the “Composition as identity” thesis. The second problem with Yi’s argument is that it misrepresents the logic of the generic predicate “is one of”. Normally, this predicate denotes membership in a plurality, as when we say that a is one (member) of a group, a bundle, a set or a collection. Fusions, however, aren’t pluralities. The tolerance our linguistic practice deploys with respect to one-membered ‘pluralities’ (which accounts for the grammaticality of (i)) does not also cover uses of the subsentential “and” as in (iii). Suppose we ask ourselves whether a and b are a proper part of $a \oplus b$. If we think this question (formulated in this way) makes sense, then we will take “and” to mean \oplus and answer in the negative. If we tacitly delete the indefinite article and add an “s” to “part”, we will affirm it. If we do neither, we are likely not to understand the question. The same happens when we ask whether $a \oplus b$ is one of a and b . If we take it to mean “is a member of”, we answer in the negative, but then we give another sense to “and” than is needed for the conclusion. If we take it to mean “is a part of” the answer is yes and we have contradicted (i). I conclude, then, that “Composition as Identity” is a viable option. I will give three further arguments in favour of (3): the first expands the “portions of Reality” answer given above; the second turns on the fact that “object” is a formal term; the third aims to show that arguments used to undermine (3) by pointing to allegedly unintuitive consequences of (i) attack in fact a stronger, and false, principle, namely (3) below.

Suppose we are given two objects, a and b , and denote their fusion by “ c ”. How are we to argue that a and b (‘taken together’ in some way) pick out the same portion of reality as c ? Portions of reality are characterised by their location and the properties that are exemplified within them. The following comprehension schema, which holds of all things x, y and z ¹⁶ and all properties ψ , gives us a way to include properties of parts in the nature of their whole:

- (1) $\forall x, y, z \forall \psi \exists \phi (x = y \oplus z \rightarrow (\psi(y) \leftrightarrow \phi(x)))$
- (2) $\forall x, y, z \forall \phi \exists \psi (x = y \oplus z \rightarrow (\phi(y) \leftrightarrow \psi(x)))$

If we accept (1), there will be gerrymandered things (like, e.g., the fusion of my ear and the Eiffel tower), entities which are best described by reference to their parts. Whether or not we accept (1), there certainly are things which are best described with reference to some whole containing them.

(1) and (2) give us properties of the form *having an F part* ($\lambda x \exists y, z (x = y \oplus z \wedge Fy)$) and *being part of an F* ($\lambda x \exists y F(x \oplus y)$) and thus give us properties of wholes out of properties of parts and vice versa.

¹⁵Yi (1999: 148) discusses several other possibilities of giving a semantics to “is one of” and rejects them on the ground that they would render some true sentences like “Every one of the animals mentioned in this paragraph is either a cat or a mouse” false, for the fusion of a cat and a mouse is neither a cat nor a mouse. In a sense, (iii) is just trivially true: a and b aren’t $c = a \oplus b$, for they aren’t fusions. They are, after all, but *proper* parts of c . But what does that tell us? Not more than, in my view, that ordinary subsentential conjunction does not mean \oplus .

¹⁶In accordance with (1), I take the quantifiers to be possibilist.

Do our comprehension schemata multiply properties beyond necessity? In a sense they do, for *having an F part* is not the same property as *F*.¹⁷ In another, and I think more important, sense they do not, for anything that justifies us in applying “*F*” to *x* justifies us in applying “has an *F* part” to $x \oplus y$. If there are no necessary connections between distinct existents *F* and *having an F part* are not wholly distinct in a sense. (1) and (2) show how our new properties are given by those we already had. Ontologically speaking, then, *having an F part* is nothing over and above *F*, although the corresponding predicate ascribes *F* ‘obliquely’ as it were, and to another entity. Whether or not something has an *F* part depends only on what is an *F*. Given a distribution of universals over space-time points, not only fusions are completely determined iff their parts are, but the distribution of properties of the form *having an F part* is determined as well: how many of these properties we use depends only how we slice up space-time into objects. If (1) really were as problematic as its enemies suppose it to be, we would expect to get entities exemplifying new properties. Although this is true in a sense, (1) and (2) show that the new properties are nothing but variants of those we already had. Our comprehension schemata thus stand and fall together with unrestricted composition: if fusion is ontologically innocent and an inventory of the world includes an entity *x* iff *x* does not overlap any other entity *y* that is itself included in the inventory,¹⁸ only the granularity of our inventory will decide between our use of *F* or *having an F part*. If (1), on the other hand, really were as problematic as its enemies suppose it to be, we would expect to get entities exemplifying new properties. Although this is true in a sense, (1) and (2) show how our new properties are given by those we already had. Ontologically speaking, then, *having an F part* is nothing over and above *F*, although the corresponding predicate ascribes *F* ‘obliquely’ as it were, and to another entity.¹⁹

(3) has been criticized from many directions. Its main alternatives divide into three groups: Nihilism, which denies that any fusions exist, and what Markosian (1998: 227) calls moderate answers to the question when some objects compose another object, which try to specify (nonempty) necessary and sufficient conditions. I take nihilism to be a blatant refusal to take mereology seriously. The general problem with the moderate answers is, as Lewis (1986: 212) has noted, that the relevant conditions are vague, but existence is not. So we are left with the third possibility, Markosian’s claim that compositional facts *that some x compose an object* are brute facts, i.e. do not obtain in virtue of other facts not of the same form. It is not easy to understand this “Brutality of Composition”-thesis, for it is unclear how it can be a brute fact whether or not something is an object. Markosian clearly intends such facts to be contingent. I do not understand, however, how it can be contingent whether something of which we are given a purely formal definite description is an object, for such a description does not specify any condition which could fail to hold. “Object”, like “thing” or “entity” is what one could call a ‘formal’ term, i.e. a term for the application of which we do not seem to need a ‘material’, i.e. subject-matter dependent, justification. If someone denied that fusions of particulars are particulars or that fusions of individuals are individuals, he would argue for his claim by showing that such fusions violate a condition we are willing to impose on the existence of particulars or individuals. He would have to show that there is a certain (specific) property *F* had by the parts but not by the fusion and that *F* is necessary for particularity or individuality. With objects, however, this is impossible, for we just do not know of any property that all objects necessarily have except *existence*. Using the alleged anomoeomerosity of *existence*, however, would beg the question.

¹⁷Though I allowed for improper parts and thus guaranteed the truth of “Every *F* has an *F* part”, the converse fails for upwards specific (i.e. most) properties.

¹⁸This is what Varzi (2000: 285) calls the “minimalist view” on the measurement of ontological commitments.

¹⁹It seems plausible to take this feature of the part-whole relation to be the reason why it is a *formal* ontological relation. The step from “*a* is partly *F* (has an *F* part *b*)” to “*b* is an *F* part of *a*” and vice versa, though they change both the predicate applied and the entity it is predicated of, seem legitimate for *grammatical reasons alone*. In this, they are analogous to the steps from “Socrates is wise” to “Wisdom is exemplified by Socrates” and vice versa.

I agree only insofar with Markosian as I take F -compositional facts, i.e. facts about the anomoeomerosity of properties, to be objective. They are facts about the world holding independently of us and our knowing them. F -compositional facts are of the following form:

(3) Whenever there are some F s, they have a fusion which is F .

Most arguments against (1) I know of do not in fact question (3) but rather instances of (3) for some specific property F .²⁰ Markosian claims that his intuitions tell him that there is no object composed of the London Bridge, a certain sub-atomic particle and Cal Ripken, Jr. and thinks that it is wrong to blame his intuitions:

Indeed, it is hard to imagine the man on the street responding to [the description given above] by saying, “Oh, sure, *that* object.” (Markosian 1998: 228)

Markosian falls victim to a cognitive form of what Armstrong calls the “headless woman illusion”, i.e. the natural, but illegitimate transition from the failure to perceive something to a ‘perception’ of something unreal. That the man in the street does not readily acknowledge the existence of some compound objects does not show that such compounds do not exist; it shows rather that the man in the street does not bother about them. The problem with (3) is that it is not only in general contingent, but false for many values of F . In contrast to (3), (1) has the advantage of being purely formal, indeed logical. All that is claimed by (1) is that there is a certain *object* fulfilling the purely formal condition of being a fusion, i.e. having some objects as parts.

Causation as a type of grounding

The simplest, and most common case where b makes a exist is causation: the cause, b , causing, producing or making happen the effect a .²¹ How is this to be analysed? I will argue for two claims: (i) the governing conception of laws of nature is to be preferred to a modal-regularist account; (ii) the relata are causation are events and causation is a type of existential determination.

Necessity stands to essence like regularities stand to causal powers. Suppose that events of type A are invariably followed by events of type B – does it follow that the A -events cause the B -events? Clearly not: a link between particular A - and particular B -events is required.²² While depending on the laws of nature and possibly other conditions, this link is between *particular* events, not the event types. Nor does it depend on the overall instantiation patterns of these types. This rules out the regularity view, according to which whether or not a sequence of events a and b is interrelated causally depends not on a and b alone, but on whether all events similar to a have events similar

²⁰Take, e.g. Alex Oliver (1994: 221): “If we measure commitment by the number of objects in our ontology, then a commitment to a cat-fusion *is* a further commitment, over and above the commitment to the cats which are its parts.” This is just to say that we should not measure commitment by the number of objects ‘in’ our ontology (at least if we take ‘our ontology’ to be some sort of list, possibly following Quine), for, as it is well known since Frege, a (natural) number is always a number of F s for some specific property F . The distinction between ontological commitment and counting has been pointed out clearly by Donald Baxter (1988: 576): “There are two ways of identity. One kind holds on different standards. [...] The other kind of identity holds between distinct things (counted on a strict standard) and a single thing (counted on a looser standard).” This latter kind of many-one identity allows us to say that the *same* can be counted in different ways. We need such a notion anyway, as is shown by the example of the fool who sells both halves of his land and thinks he can keep the whole. So let’s call it “composition”. As counting is relative to sortal terms, we cannot rank ontologies by the number of objects they admit. It seems plausible to adopt what Varzi (2000: 285) calls “Mereological Minimalism”: “An inventory of the world is to include an entity x if and only if x does not overlap any other entity y that is itself included in that inventory.”

²¹I distinguish between “causality”, standing for the phenomenon of causes causing effects, and “causation”, the relation of determination holding between particular causes and their effects.

²²This is why Hume is rightly regarded as an *eliminativist* about causation, even though he gives an account of causality.

to *b* as effects. This makes causal relations extrinsic and commits its defenders to the possibility of backwards causation:

[The view that the essence of causality is regularity] means [...] that God, by frustrating the activity of an *A*-type item in the year 2050, could retrospectively bring it about that this year's particular case of *A* didn't cause this year's *B* after all. (Campbell 1990: 117)

Moreover, the regularity view is unable to account for probabilistic causation, for every observed sequence is compatible with every probability between 0 and 1. The regularity view, while accounting for the contingency of causation, gets the direction of explanation wrong: the regularity does not explain, but is rather explained by, the individual cases of causation.

Lewis' counterfactual analysis of causation shares these drawbacks, while losing the regularity theory's main advantage. It analyses causation in terms of relative distances between possible worlds: these relative distances, however, are to an important part to be explained in terms of similarities and dissimilarities between the *causal* characteristics of these worlds. The truth of counterfactuals must itself be grounded: and it must be grounded in relations of causation.²³ Even if counterfactuals can be shown to be more fundamental than claims about what causes what, however, their contingency can be secured only at a high prize: to make specific counterfactuals contingent, important assumptions have to be made about the whole space of possible worlds.

The relata of causation are events.²⁴ Events have their spatiotemporal locations essentially, so their causal dependence ties are ties of ontological dependence:

To avoid confusion, ontological should be distinguished from causal dependence. If *x* causes *y* to come into existence, then the coming into existence of *y* is dependent on *x*. It does not follow, though, that *y*'s existence – to be contrasted with its coming into existence – is dependent on *x*. [...] Dependence of existence I call ontological dependence in order to distinguish it from dependence of coming into existence, which I call causal dependence. (Fisk 1972: 140)

It is true that, in general, causal should be distinguished from ontological dependence: for events, however, the two ties coincide. The effect could not have come into existence at any other time than it actually did – its existence depends on its particular coming into existence. Causation of events, therefore, is existential determination: the existence of the effect is determined by the cause.

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²³Lewis' theory shares this important vice with the theory of Kant (1787: 95, 106) who transcendently deduced his category of causality from the hypothetical form of judgement (cf. Bacon 1995: 75).

²⁴Campbell (1990: 114) argues that it should not be presupposed a priori that the relata of causation are always events. He mentions standing conditions as other candidates, as they occur in "The acid's concentration caused the container to erode" (first relatum), "The power failure resulted in the black-out" (second relatum) and "The skin's pigmentation prevented any melanoma" (both relata). But we may count states as (very slow) changes (cf. Geach (1968) who hints at the thesis that occurrent actualities like Socrates' running are changes). Thanks to Kevin Mulligan here.

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