Coincidence and supervenience

Ralf M. Bader
Université de Fribourg

ABSTRACT: Pluralists argue for the distinctness of coinciding objects on the grounds that they have different properties. The grounding problem is the problem of explaining how the supposed difference in properties can arise in the first place. This paper considers this problem as an instance of a more general phenomenon, namely the problem of dealing with underdetermination in asymmetrical systems admitting of non-trivial automorphisms. It argues in favour of primitivism by developing an account of stochastic grounding that makes room for non-fundamental bruteness and substantially mitigates the costs of primitivism.

1 The grounding problem

Pluralists argue that distinct objects can coincide even though they are composed from the same parts at some level of decomposition. To establish distinctness, they appeal to Leibniz's Law and the fact that these objects have different properties – whilst sharing the same nonsortalish properties, they differ with respect to their sortalish properties.[1] Given, for instance, that the lump can survive squashing while the statue lacks this property, the pluralist concludes that the statue is distinct from the lump.[2]

The grounding problem puts pressure on the claim that coinciding objects are distinct due to having different properties.[3] Cases of coincidence involve objects that are discernible with respect to their sortalish properties, even though 1. these objects are indiscernible in terms of their nonsortalish properties, and 2. the parts out of which they are composed are indiscernible tout court. Sortalish

[1] Bennett introduces the label 'sortalish properties' to "refer indiscriminately to (i) persistence conditions, particularly modal properties like *being essentially shaped about like so*, (ii) kind or sortal properties, and (iii) properties that things have partially in virtue of their instantiation of properties in categories (i) or (ii)" (Bennett: 2004a, p. 341).

[2] Monists have attempted to defuse this argument by appealing to predicational shifts. For a critique of such attempts cf. Fine: 2003.

[3] It is also known as the 'indiscernibility problem' or the 'supervenience argument' and has been labelled as the 'standard objection', cf. Burke: 1992, Olson: 2001, Bennett: 2004a.

properties, consequently, do not supervene on nonsortalish properties. Nor do the properties of wholes supervene on the properties of their parts. Coinciding objects thus violate both single- and multiple-domain supervenience.

The differences in properties to which the pluralist appeals fail to supervene. Pluralists have to explain how it is possible for coinciding objects to differ in properties. They must find a way to ground the differences in properties amongst coinciding objects, explaining how it is possible for these differences to arise.[4]

One way of addressing the grounding problem is to adopt a mereological approach. If there are different ways of composing objects, then differences in properties amongst coinciding objects can be explained in terms of the different ways in which they are composed. Though they are made from the same parts, coinciding objects differ because they are made in different ways. In the same way that there can be differences amongst sets that are generated out of the same elements, or amongst states-of-affairs that are constructed out of the same constituents, such as [aRb] and [bRa], on the basis that they are constructed in different ways, so there can be differences amongst objects that are composed from the same parts, on the basis that they are composed in different ways. This involves a non-standard mereology, such as a form of mereological pluralism that countenances different composition relations, or a hylomorphic mereology that considers objects to be hylomorphic compounds that have a formal element (cf. Fine: 2008, Hawley: 2006, section IV).[5]

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[4]Whilst weak global supervenience (cf. Sider: 1999) and intermediate global supervenience (cf. Bennett: 2004b, Shagrir: 2002) are compatible with coinciding objects, these supervenience relations do not track sufficiently substantial determination and dependence relations and thus cannot solve the grounding problem. The problem is not simply to come up with some supervenience relation that does not conflict with pluralism, but with a relation that explains the differences in properties (cf. Olson: 2001, p. 345).

Relatedly, single-domain supervenience violations can be avoided by including non-qualitative properties in the base. Since the statue and the lump differ in terms of their non-qualitative properties one can try to give identity-based explanations of their differences (cf. deRosset: 2011). This approach, however, is implausible. First, identity properties are the wrong kinds of properties to explain sortal differences. What makes one object a statue but the other a lump is not plausibly a difference in identity properties. Second, the explanation of what makes a non-coinciding object a lump does not involve any identity properties. This suggests that the explanation of what makes a coinciding object a lump should likewise not involve such properties. The problem is not only that the explanation for why Lumpl is a lump does not generalise to other cases (an objection that deRosset considers), but that identity properties play no role whatsoever in grounding the sortalish properties of an isolated lump and that bringing in identity properties in that case would be superfluous. Third, the proposal does not avoid failures of multiple-domain supervenience. In particular, the identity properties of coinciding objects cannot be explained in terms of the properties (including non-qualitative properties) of their parts. Whilst some identity properties can be taken to be primitive, the identity properties of derivative entities should be explicable in terms of the identity properties of those entities from which they derive.

[5]Attempts to solve the grounding problem by means of a constitution view cannot succeed. In order to explain differences amongst coincidents, the constitution relation would have to be a generative relation. The problem now is that the lump constitutes the statue, yet the statue is also

The mereological approach construes the grounding problem in terms of a failure of multiple-domain supervenience. It concerns the relationship between the properties of the parts and the properties of the whole, rather than the relationship between the sortalish and nonsortalish properties of the whole. The differences in sortalish properties amongst coinciding objects are explained, not in terms of their nonsortalish properties, but in terms of the properties of their parts together with the ways in which the wholes are composed.[6]

This paper, by contrast, construes the grounding problem in terms of a failure of single-domain supervenience. The problem is to explain the sortalish properties of an object in terms of its nonsortalish properties. Although this approach is likewise committed to a non-extensional mereology, the rejection of extensionality plays no role in addressing the grounding problem, nor is it necessary for generating this problem. The fact that coinciding objects are composed from the same parts is incidental from this perspective. On the one hand, the solutions do not invoke mereological resources, which means that, even though the pluralist has to accept a non-extensional mereology, there is no need to commit to a structured mereology that countenances hylomorphic or compositional structure. On the other, the grounding problem would still arise and be just as problematic if the statue and the lump were to share the same nonsortalish properties yet merely coincide spatially but not mereologically.

This construal of the grounding problem considers it as an instance of a more general problem that also arises in cases in which there is no violation of extensionality, namely the problem of dealing with underdetermination in asymmetrical systems admitting of non-trivial automorphisms. The grounding problem is then analogous to that of explaining how incongruent counterparts can differ in chiral properties and fail to be superposable even though they are intrinsically indiscernible, how entangled fermions can differ in spin even though they have the same base properties, and how i and $-\mathrm{i}$ can differ even though they are structurally indistinguishable. The same problem arises in these cases. In each case, various properties seem to be underdetermined since they are distributed asymmetrically, even though there is symmetry at the level of the supervenience base, i.e. the system admits of non-trivial automorphisms. The space of possible solutions to this problem has the same structure in all these cases. In particular, there

composed of its parts (where the parts of the statue do not correspond to the parts of the lump). This is problematic because it is not possible for both relations to be generative relations. It might be thought that the statue is prior to its parts, i.e. that decomposition rather than composition is generative in this case. However, the same problem arises at the level of the parts and we ultimately end up with parts that are parts of the lump and, as such, will be prior to the statue. This means that one either ends up with a cyclic ordering or with a case in which one and the same thing is generated by two different things, which is impossible. Accordingly, the relation between the lump and the statue cannot be a generative relation – the lump and statue have to be conceived of as being on the same level.

[6]For an account of multiple-domain supervenience relations for non-classical mereologies incorporating compositional and hylomorphic structure, cf. Bader: 2013.

are four solutions.

Non-revisionist approaches can appeal to (i) ontic indeterminacy, or (ii) brute facts. These approaches conflict with strong supervenience but try to show that this failure of supervenience is relatively unproblematic. Whilst the indeterminacy proposal involves objectionable commitments (section 3.1), primitivism will be shown to be defensible and plausible (section 3.2). Bruteness will be limited since nonsortalish properties fix the sortal profiles that are instantiated and only fail to determine their distribution amongst the coinciding objects. Moreover, we will develop an account of stochastic grounding that makes room for non-fundamental bruteness and thereby substantially mitigates the costs of primitivism. Nevertheless, there is some residual bruteness which implies that primitivism does not completely address the grounding problem.

To fully resolve the grounding problem, one has to show that there is no conflict with strong supervenience. Revisionist approaches revise our ordinary understanding of properties and of objects in order to give an account of coinciding objects that is compatible with strong supervenience. Whereas solution (iii) rejects monadic sortalish properties in favour of symmetric relations, (iv) considers the system of coinciding objects to be the bearer of sortalish properties. It will be argued that, although revisionist proposals are plausible in other contexts, they run into difficulties in the case of coinciding objects (sections 3.3 and 3.4). Accordingly, pluralists should adopt primitivism.

2 Grounding differences

Pluralists need to explain the differences amongst coinciding objects. This task is rendered difficult by the fact that strong supervenience fails, which implies that the sortalish properties of wholes can neither be explained in terms of their nonsortalish properties, nor in terms of the properties of their parts.

Cases of coincidence, however, exhibit several noteworthy features that suggest that the failure of supervenience is not to be equated with an absence of determination per se. Although A-properties of wholes taken individually do not supervene on the B-properties of their parts, A-properties of wholes taken collectively do supervene on the B-properties of their parts. Strong multiple-domain supervenience holds when operating with a many-many co-ordination relation (cf. Bader: 2013, section 3.3). Similarly, properties such as 'being a statue or coinciding with a statue', as well as disjunctive properties formed by disjoining the sortalish properties of the coinciding objects, e.g. 'being either a lump or a statue or a …', do strongly supervene. Moreover, the conjunctive property of 'containing a lump and containing a statue and …' had by regions of space-time also strongly supervenes. Likewise when it comes to the property of 'composing a lump and a statue and a …' which is had by the parts that are shared. This means that the base fixes how many coinciding objects there are and which sortal

profiles are instantiated by them. The only thing that fails to supervene is the distribution of these properties amongst the coinciding objects.

The existence of coincident objects, as well as the sortalish properties had by them, is grounded. The distribution of these properties, however, is ungrounded. The grounding problem is thus not about how many objects there are, nor about which properties are instantiated by them, but about the way in which these properties are distributed amongst the coinciding objects. The problem is to explain which object gets which property.[7] Since the objects share all their nonsortalish properties, they are equally eligible for falling under each of the available sortals. The supervenience base, accordingly, does not determine a unique distribution of sortalish properties, but is compatible with a range of different distributions. It underdetermines the actual distribution, while fully determining the range of possible distributions.

2.1 Which is which?

The grounding problem seems to arise because there are two possible distributions that differ with respect to which individual gets which property. These distributions are permutations of each other that result from switching around the sortal profiles of the objects. Since there is nothing to privilege one of them over the other, there is nothing that determines which coinciding object gets which properties. Accordingly, the actual distribution is underdetermined.

The fact that there are two possibilities that differ merely in terms of which object gets which properties seems to be what generates the problem. This suggests that pluralists can address the grounding problem by denying that there are two possibilities. If sortal profiles cannot be switched around, the problem would seem to dissipate. There are two ways in which pluralists could deny that there are two possibilities.

First, one can eschew individualistic facts and reject the cross-world identities that are required for distinguishing the two possible distributions. For instance, the form of generalism advocated by Dasgupta: 2009 does not countenance individualistic facts but only existentially quantified facts.[8] This approach does not recognise objects that could switch sortal profiles. There is thus only one possibility. Although two different descriptions can be given in a language that contains individual constants, there is only one invariant description in the metaphysically perspicuous generalist language.

Second, one can adopt a form of sortal essentialism (cf. Burke: 1994) that does not allow objects to have different sortal profiles in different possible worlds. Sortal essentialism ensures that objects cannot switch their sortal profiles. If x is

[7] Cf. "What the 'subvenient' physical states are apparently not sufficient to determine is which object is which" (Zimmerman: 1995, p. 90; also cf. Bennett: 2004a, p. 344).

[8] Similar results can be achieved by means of qualitativism, anti-haecceitism, and structuralism.

L, then it is essentially L and hence could not have failed to be L. Accordingly, it is not the case that there are two ways the world could be, two ways in which the sortal profiles could be distributed amongst the objects.

Denying that there are two possibilities, however, does not defuse the grounding problem. This is especially clear in the case of sortal essentialism. Even if there is only one possible assignment, one still has to explain what is responsible for the relevant sortalish properties. Such an explanation is not forthcoming. There is nothing that makes it the case that x is L in the first place. This highlights that the grounding problem is an explanatory problem. One needs to show how sortalish properties of wholes can be explained either in terms of their nonsortalish properties or in terms of the properties of their parts. Accepting sortal essentialism does not address this explanatory challenge.

Denying individualistic facts is, likewise, of no help. We can state the problem in predicate logic with identity but without constants, to which the generalist language is meant to be equivalent. The existentially quantified statement $\exists x \exists y[(\Gamma x \wedge Lx) \wedge (\Gamma y \wedge Sy)]$ implies a violation of single-domain supervenience of the sortal properties L and S on the nonsortalish profile Γ. Since the shared nonsortalish profile does not necessitate L, neither Γx nor any component thereof can explain Lx. Similarly, multiple-domain supervenience is violated if we have: $\exists x \exists y \exists zz[\Delta zz \wedge (x \text{ is a fusion of } zz \wedge Lx) \wedge (y \text{ is a fusion of } zz \wedge Sy)]$. The sortal properties L and S of the wholes do not supervene on the property profile of their shared parts Δzz. Hence, Lx cannot be explained.

Instead of asking whether it is *Lumpl* or *Goliath* that is L, we can ask: 'how is it possible for one thing that has nonsortalish profile Γ (or that is composed of parts that have as their property profile Δ) to be L yet for another thing that has Γ (or that is composed of parts that have Δ) to be S?'. The 'which is which?' question can be asked without any commitment to individualistic (haecceistic/nonqualitative) facts. There is no need for proper names or individual constants. What is at issue is the relation between having a certain nonsortalish property profile or being composed of certain parts, on the one hand, and having certain sortalish properties, on the other. The problem is to explain how objects end up with properties that are asymmetrically distributed amongst them, i.e. how one thing ends up being a lump whereas the other ends up being a statue, even though they agree on all the base features.[9] Accordingly, it is better to ask the intra-object contrastive questions 'what makes x a lump rather than a statue?' and 'what makes y a statue rather than a lump?' rather than the inter-object contrastive question 'what makes x rather than y the statue and y rather than x the lump?'.

Since the grounding problem is generated by means of a non-trivial automorphism, i.e. an intra-world mapping, the problem does not presuppose any trans-world identities, i.e. there is no need for re-identification of individuals

[9]For this reason the answer given to the distribution question by Sutton: 2012, pp. 718-719 is also inadequate.

across possible worlds. This means that the grounding problem does not involve any modal commitments, in particular no commitment to the possibility that coinciding objects can switch their sortal profiles.

2.2 Incompatible sortals and generative principles

The number of coinciding objects, as well as the sortalish properties distributed amongst them, strongly supervenes. This fact can be explained by means of generative principles. Such principles specify the necessary and sufficient conditions for the existence of an object falling under a sortal and thereby explain how the nonsortalish properties instantiated in a particular region determine which sortalish properties are instantiated therein. The pluralist needs to hold that (bracketing concerns about maximality) it is sufficient for the existence of an object falling under a particular sortal that there be an object that has the relevant nonsortalish properties to satisfy the criteria of that sortal. All it takes for there to be an F is that there are parts arranged such as to compose wholes that have nonsortalish properties that satisfy the criteria of the sortal F.[10]

This implies that incompatible sortals will be instantiated if the sortal criteria of a plurality of sortals are satisfied.[11] Since these incompatible properties cannot be had by the same object, there must be distinct objects amongst which the properties can be distributed. The parts, in this way, necessitate the instantiation of a plurality of incompatible sortals that cannot be instantiated by the same object but that require a plurality of coinciding objects amongst which they can be distributed.

Although the parts are sufficient for the existence of an object that instantiates

[10] Cf. "an object of kind *K* exists just in case there is some matter arranged *K*-wise" (Rea: 1997, p. 371).

[11] Rea has argued that "multiple objects fill a given region just in case there is matter in that region which is arranged in more than one object-constituting way at once" (Rea: 1997, p. 372; also cf. Johnston: 2006, section 8). This approach has recently been refined by Saenz: 2015, who operates with grounding rather than supervenience. They are correct in pointing out that the properties that account for the existence of the lump differ from those that account for the existence of the statue. Moreover, it is true that "[i]t is precisely because of this that we can have two objects with all the same parts, arranged in precisely the same way, that differ in their kind and modal properties" (Saenz: 2015, p. 2202). Although this fact explains how the criteria of a plurality of sortals can be satisfied and hence plays a role in explaining why there are coinciding objects, it does not solve the grounding problem, since it does not explain how sortalish properties are distributed. As Olson notes, "[t]he difference between the humanwise and lumpwise arrangement of particles is not a difference between Socrates and the lump, for both objects have their parts arranged in both ways. Socrates' particles are arranged lumpwise as well as humanwise. Why, then, is it the latter that determines his properties, and not the former, or both?" (Olson: 2001, pp. 350-351). The problem is that what makes x a lump cannot be explained in terms of its parts being arranged a certain way, since y is not a lump yet its parts are arranged in the very same way as those of x (unless one thinks of the arrangement or form in hylomorphic terms, in which case this turns into a mereological solution along the lines of those briefly discussed in section 1).

a particular sortal, they are not sufficient for determining which object it is that instantiates this sortal. The parts explain that there are two objects such that one is a lump and one a statue, without the parts grounding which of them is the lump and which the statue. Since they share all their nonsortalish properties, they are equally eligible candidates. Indiscernibility with respect to nonsortalish properties ensures that there is nothing that could make a difference and that could privilege one of these objects. As a result, it is underdetermined under which sortal a particular coinciding object falls.

3 Four solutions

To recap, nonsortalish properties determine which sortalish properties are instantiated, yet the distribution of these properties amongst the coinciding objects is underdetermined and fails to supervene. In short, nonsortalish properties are responsible for grounding differences, but not for grounding the distribution of differences. Pluralists have four options.

First, there are non-revisionary approaches that retain our ordinary understanding of objects and properties. These approaches take the pluralist's commitments at face value. They accept that the distribution of sortalish properties is underdetermined and thus accept that a determinate distribution of sortalish properties fails to supervene. Yet, they attempt to show that the failure of supervenience is relatively unproblematic. Solution 1 shows that pluralists can retain many of their commitments while rejecting the claim that there is a determinate distribution of sortalish properties. The distribution will then involve ontic indeterminacy, i.e. there is no fact of the matter as to how sortalish properties are distributed. According to solution 2, pluralists can consider the distribution of sortalish properties to be a brute fact. Whilst solution 1 runs into difficulties, we will develop an account of stochastic grounding to defend primitivism, showing that, rather than being ungrounded, sortalish properties are incompletely grounded.

Second, there are revisionary approaches that reconfigure our understanding of coinciding objects and the properties had by them. Revisionists claim that our ordinary ways of thinking about coincidence are misleading and misrepresent reality due to containing various nonfactual elements. Instead, they favour a factual language that is metaphysically perspicuous.[12] The pluralist's characterisation of coincidence is then not to be taken at face value. Some aspects of it should be treated as nonfactual, namely those aspects that give rise to underdetermination. Supervenience holds when coincidence is characterised in the factual language that leaves out nonfactual elements and reveals its true metaphysical

[12] For a helpful discussion of the distinction between the factual and the nonfactual cf. Fine: 2001 & Fine: 2005, chapter 8.2.

import. Revisionists can thereby rule out genuine underdetermination and argue that supervenience does hold if coincidence is suitably reconceived.

Mischaracterisation can either occur at the level of properties or at the level of objects. Solution 3 is revisionist about the properties that are instantiated by coinciding objects. It proposes an alternative construal whereby coinciding objects are symmetrically positioned due to standing in weakly discerning symmetric relations. Solution 4, by contrast, is revisionist with respect to what is doing the instantiating. It revises our understanding at the level of objects so that there is no need to distribute properties asymmetrically amongst coincidents but only a need to attribute collective properties to the system of coinciding objects. Both argue that underdetermination is an artefact of our ordinary ways of (mis)representing the world. Indeterminacy is thereby relegated to the level of representation, allowing us to combine determinacy at the level of the world with underdetermination at the level of our ordinary representation of coinciding objects. We will argue that, even though these proposals are adequate in other contexts, they cannot be applied to the case of coinciding objects.

3.1 Ontic indeterminacy

The distribution of sortalish properties lacks a ground. One could simply leave it at that and consider the distribution to be ontically indeterminate. There would then be no fact of the matter as to which of the coinciding objects instantiates which sortalish properties, e.g. no fact of the matter which of them is the lump and which the statue. The distribution is indeterminate since nonsortalish properties are meant to fix the sortalish properties yet underdetermine their distribution.

This is a pluralist view. There is a plurality of objects that are made from the same parts. That it is indeterminate which of x and y is the lump and which the statue does not change the fact that there are two distinct objects. Despite being indiscernible, x and y are distinct. Their distinctness cannot be established by identifying a difference in properties and then appealing to Leibniz's Law. Nevertheless, since the nonsortalish properties confer incompatible sortalish properties, there must be two objects, even when it is indeterminate on which objects these incompatible properties are conferred.

Though there is no object that is determinately a lump, it is nonetheless determinately the case that there is a lump. The existential facts are fully determinate. This can be seen by supervaluating over the possible distributions. There are two possible distributions, if there are two coinciding objects. According to the proposed solution, it is ontically indeterminate which of them obtains. D_1: x = statue & y = lump, and D_2: x = lump & y = statue. Supervaluation yields that it is determinately the case that there is a statue and a lump, even though neither object is determinately a statue or determinately a lump.

How indeterminacy interacts with supervenience is not entirely clear. On

the one hand, we can characterise indiscernibility such that a bijection Γ is A-preserving iff for any object x and any A-property F:

1. x determinately has F iff its image Γ(x) also determinately has F, and

2. x neither determinately has nor determinately lacks F iff its image Γ(x) also neither determinately has nor determinately lacks F.

Construed in this way, coinciding objects are A-indiscernible and strong supervenience holds. Each object is neither determinately a statue nor determinately not a statue, and likewise neither determinately a lump nor determinately not a lump, since each object is a lump on one candidate distribution yet a statue on the other. Accordingly, every B-preserving mapping is A-preserving.

On the other hand, one can evaluate whether the different candidate distributions involve a failure of supervenience and then supervaluate over these candidates. This approach yields a determinate failure of supervenience. Every candidate distribution involves a failure of supervenience, since there are B-preserving mappings that are not A-preserving.

The situation is analogous to the doctrinal paradox (cf. Kornhauser and Sager: 1986). Either one first determines what properties x and y have by supervaluating over candidate distributions and then evaluates whether supervenience holds. Or one evaluates under each candidate distribution whether supervenience holds and then supervaluates. The first route leads to the conclusion that supervenience holds, whereas the latter leads to the opposite conclusion. Supervenience thus fails on at least some construals.

	x	y	supervenience
D_1	L	S	
D_2	S	L	
	$\nabla S \wedge \nabla L$	$\nabla S \wedge \nabla L$	✓

	x	y	supervenience
D_1	L	S	✗
D_2	S	L	✗
			✗

Moreover, this approach has the unpalatable implication that diachronic identity can be indeterminate. If a statue and a lump coincide at t, such that there is an x and a y whereby it is indeterminate which of them is the statue and which the lump, and the statue/lump gets squashed so that only the lump exists at t′, then there is no fact of the matter whether the lump existing at t′ is diachronically identical with x or y existing at t. Even though it is determinately the case that the lump existing at t′ is identical with whichever thing it is that is the lump at t, it is indeterminate whether x or y is the lump at t.[13] Accordingly, this solution to

[13] For a somewhat related concern in the quantum case, cf. Lowe: 1999.

the grounding problem not only involves the possibility of indeterminacy with respect to the properties that objects have, but also the possibility of indeterminate identity.[14]

3.2 Brute facts

The distribution of sortalish properties is underdetermined. The nonsortalish properties do not determine a particular distribution of sortalish properties but are compatible with a range of possible distributions. Instead of claiming that there is no fact of the matter as to how these properties are distributed, pluralists can claim that the distribution of sortalish properties is a brute fact. It is a brute fact that x rather than y is a lump and that y rather than x is a statue, or alternatively, that it is a brute fact that x is a lump rather than a statue and that y is a statue rather than a lump.[15] It is only a small step from claiming that there is no fact of the matter to claiming that there is a brute fact of the matter (cf. van Cleve: 1992).

Extant primitivist approaches consider sortalish properties to be ungrounded. Or, more precisely, they take a subset of them (such as modal, sortal, identity, or essential properties) to be ungrounded and explain the remaining sortalish properties in terms of them. This commitment to ungrounded sortalish properties is implausible and gives rise to numerous problems:

1. First, it would be counter-intuitive. A fact that is ungrounded is a fundamental fact. Yet, lumps and statues are the wrong kinds of objects to feature in fundamental facts. They are mereologically complex and are not plausible candidates for inhabiting the fundamental level of reality.

2. Second, the object (whichever it happens to be) that ends up being the lump has various properties in terms of which its being a lump can seem-

[14] Alternatively, one can argue that diachronic identity facts are determinate and instead consider existence facts to be indeterminate. D_1: x is L at t and x persists until t' whereas y goes out of existence. D_2: y is L at t and y persists until t' whereas x goes out of existence. On this proposal it is not diachronic identity that is indeterminate. Instead, what is indeterminate is whether it is x or y that exists at t'. Existence rather than persistence would then be infected with indeterminacy. Yet, if persistence is governed by informative criteria of identity, then synchronic facts need to be determinate in order for diachronic facts to be determinate. The indeterminacy at t, accordingly, implies indeterminacy in terms of diachronic identity.

[15] Bennett has tried to mitigate the costs of bruteness by embracing plenitude, on the grounds that plenitude implies that there is no need to give an explanation as to why a particular modal profile is instantiated. If "*all the modal bases* are covered" (Bennett: 2004a, p. 355), then there is no mystery involved in any particular profile being instantiated. By contrast, any restriction on the availability of modal profiles might seem arbitrary and problematic. However, there is no need for plenitude since it is not a brute fact which sortal profiles are instantiated. Instead, it is only the distribution of the available profiles that is brute. What needs to be explained is not why some profiles are instantiated whereas others are not (in which case plenitude might help), but how the available profiles are distributed and in this respect plenitude is of no help.

ingly be explained. It can have the very features that make it the case that an isolated (i.e. non-coinciding) lump falls under this sortal. Since these properties can do the explanatory/grounding work in the case of the isolated lump, why can they not likewise do the work in the case of the coinciding lump? Even though these properties cannot necessitate the relevant sortalish properties (given that supervenience fails), they should nevertheless be able to play some explanatory role.

3. Relatedly, the property of being a lump is either a fundamental property or a derivative property. Since an isolated lump has the property of being a lump derivatively, being a lump is not a fundamental property. If the bruteness involved in the case of a coinciding lump were to imply fundamentality, then the property of being a lump would turn out to be disjunctive. It would subsume two quite different properties, namely a derivative property of being an isolated lump as well as a fundamental property of being a coinciding lump. (This would make the bruteness approach suffer from some of the same difficulties as the revisionist proposals, cf. sections 3.3 and 3.4.)

4. Finally, if sortal properties were fundamental, then it would be difficult to explain the supervenience of the available sortal profiles. Since fundamentalia are generally independently recombinable, this would suggest that one can have statues without lumps and vice versa, without any difference in terms of their parts, thereby contradicting the supervenience of the available sortal profiles.

Accordingly, it is crucial to explain how the distribution can be brute, without sortalish properties turning out to be fundamental. One needs to reconcile bruteness with non-fundamentality. This requires distinguishing fundamental facts from brute facts. Though everything that is fundamental is brute, the converse needs to be denied. One needs to argue that there can be brute non-fundamental facts, such that it can be a brute fact that x is a lump without it being a fundamental fact.

This distinction can be drawn by means of the notion of an incomplete ground, which can be precisely characterised by means of a theory of stochastic grounding.[16] Something that is incompletely grounded is to some extent grounded and to some extent brute. It is not fundamental since, even though its ground is incomplete, it does have a ground and hence is derivative. Whilst being derivative, it is nevertheless brute insofar as the ground that it does have is incomplete. Something that is fundamental, by contrast, lacks a ground altogether. Fundamentalia are not even incompletely grounded. They are ungrounded and hence

[16] For a detailed account of stochastic grounding cf. Bader: 2021.

are entirely brute. Fundamentality is the limit of bruteness.[17]

Incomplete grounds can be found when there are both contributing and contravening grounds. Explanation then takes the form: 'L is grounded in Γ, despite Δ'.[18] The contributing grounds Γ explain L, despite the contravening grounds Δ. Incomplete grounds underwrite incomplete explanations. Such explanations go some of the way, but not all of the way, towards explaining the explanandum. Whatever is missing for a complete explanation is left to chance. The lower the probability, the more is left for chance to do. As a result, the phenomenon in question will be more brute and the explanation that can be given will be less complete. A more complete and hence stronger explanation, by contrast, is one that leaves less to chance.

The presence of contravening grounds ensures that the relation between the ground and what is grounded is stochastic.[19] The contributing and contravening grounds do not determine what happens. Two incompatible outcomes are compatible with Γ and Δ. One either has 'Lx because of Γx, despite Δx' or 'Sx because of Δx, despite Γx'. (The contributing grounds for being a lump are contravening grounds for being a statue and vice versa, given that the two are incompatible, so that what favours the one contravenes the other.) Lx and Sx are each compatible with a situation in which both Γx and Δx obtain. Which of the two outcomes results then depends on whether it is Γx or Δx that succeeds in grounding. This is not determined by Γ and Δ (since they are compatible with both scenarios) but is left to chance. It is up to chance which ground wins out and hence a brute fact whether Lx or Sx.[20]

This allows for both 'Γx grounds Lx, despite Δx' and 'Δy grounds Sy, despite Γy'. Γ can be explanatory in the case of x whilst Δ is explanatory in the case of y, thereby ending up with both a lump and a statue. Coinciding objects can share the properties that incompletely ground being a lump in one case, yet fail to do so in the other case (and likewise for the properties that ground being a statue), without there being any explanation for this difference but instead it simply being a matter of chance.[21]

[17] The distinction between the fundamental and the merely brute is analogous to that between what is uncaused and what has a probabilistic cause, i.e. what is the result of a chancy process.

[18] Cf. Humphreys: 1989 for a very helpful account of probabilistic explanation that has the form 'X because of ϕ, despite ψ'.

[19] Probabilities have to be construed as objective chances in line with propensity interpretations.

[20] Solutions 1 and 2 agree that the base facts do not fix a unique outcome. Yet they explain this underdetermination in different ways. Solution 1 operates with grounding gaps, whereby multiple outcomes are compatible with the grounds, without the grounds fixing one of them – the world has not made up its mind about which of them is the case, resulting in an indeterminate distribution. Solution 2, by contrast, operates with grounding gluts, in that multiple incompatible outcomes have contributing grounds – the world has to decide amongst them to resolve the conflict, resulting in a brute distribution.

[21] As long as Γ/Δ are intrinsic, the sortalish properties that are stochastically grounded in them will be had intrinsically, even though they will not be shared across duplicates (cf. Bader: 2021

Though there is only a probabilistic explanation of x being a lump, there is a deterministic explanation of the existential fact that there exists a lump. The existential fact is deterministically grounded in its instance. Since it is a matter of chance which thing is the instance, it is a matter of chance which thing grounds the existential fact. Though Γx and Γy are only stochastic grounds and hence do not individually explain the existence of a lump, it is not a matter of chance that there is an instance that is doing the grounding. This is because they are anti-correlated and constitute each other's back-up ground. Γy is the back-up ground of Γx such that were Γx to fail to ground the existence of a lump, then Γy would do so instead, and vice versa. Despite not jointly grounding its existence, they jointly necessitate the existence of a lump. They collectively necessitate without collectively grounding. This explains why the available sortal profiles supervene.

If there are no contravening factors, then Γ is a complete ground for L. Γ is then a deterministic ground and the probability is $= 1$, i.e. nothing is left to chance.[22] This allows us to provide a unified account that applies both to coinciding and isolated lumps.

$$P(\Gamma x \text{ grounds } Lx \mid \Delta x) < 1$$
$$P(\Gamma y \text{ grounds } Ly \mid \emptyset) = 1$$

This account recognises the difference between the two cases, namely that they differ with respect to whether or not the grounding involves bruteness. Coinciding lumps are stochastically grounded in Γ. Since there are contravening grounds, the explanation is incomplete and needs to be supplemented by chance. Isolated lumps, by contrast, are grounded deterministically in Γ and do not involve any bruteness.[23] Yet, it also recognises that these cases share something in common, namely that they involve the same ground. In each case Γ is the ground. This means that coinciding and isolated lumps share something in common that makes both of them lumps. Accordingly, one ends up, not with an objectionably disjunctive account of the property of being a lump, but with a unified account.

If being a (coinciding) lump were a fundamental property, then no explanation would be available. This would render the resulting bruteness objectionable. The proposed account, however, shows that the bruteness is limited. Rather than there being no explanation, there is an incomplete explanation. This means that the distribution is merely brute without being fundamental. The bruteness that the pluralist needs to countenance is, accordingly, limited.

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for an account of intrinsicality in the context of stochastic grounding). This account can, accordingly, respect the idea endorsed by many three-dimensionalists that potentialities are taken to be temporally intrinsic, cf. Hawthorne: 2006, pp. 101-102.

[22] Probabilities apply (in the first place) to grounding relations. This is analogous to the causal case if one rejects the probability pool interpretation.

[23] This is analogous to how c can be a deterministic cause of e in one context, yet only a probabilistic cause of e in a different context in which contravening factors are present.

3.3 Symmetric relations

The supervenience base is symmetrical. Coinciding objects are indiscernible in terms of nonsortalish properties. Sortalish properties, however, are distributed asymmetrically – one object is a statue whereas the other is a lump. This explains the apparent underdetermination of the distribution of sortalish properties, leading to indeterminacy or primitivism.

By rejecting monadic sortalish properties and instead only operating with symmetric sortal relations, one can reject the need for an asymmetrical distribution. If nothing needs to be distributed asymmetrically, then no underdetermination results from the fact that coinciding objects are symmetrically positioned. Rather than there being monadic properties with respect to which coinciding objects differ, there are only symmetrical relations connecting these objects. Differences in properties amongst coincidents are relegated to the level of ordinary discourse. These differences are treated nonfactually on the grounds of misrepresenting reality. The factual commitments that faithfully represent reality consist in underlying symmetric relations. Coincidence is then compatible with supervenience, yet one still ends up with a plurality of objects, since their distinctness is established due to the irreflexivity of the relations.

This strategy works nicely in the case of chiral properties. Prima facie, there is a failure of supervenience. Left and right hands are intrinsically indiscernible and stand in symmetric relations. The supervenience base is, accordingly, symmetric. Yet, there is an asymmetric distribution of monadic chiral properties – some hands are rights hands whereas others are left hands. There is a straightforward solution. Reality only contains symmetric relations: 'same-handedness' and 'opposite-handedness', that partition objects into two congruence classes. At the metaphysical level, everything is perfectly determinate. Monadic chiral properties, such as 'being right-handed', are mere conventional artefacts of our representation and are treated nonfactually. They are introduced stipulatively, by ostensively picking out a member of one congruence class and labelling it as a right hand, such that all hands that are same-handed as this hand also classify as right hands, whereas the others classify as left hands. Arbitrariness is thus restricted to the linguistic/conventional level and only afflicts nonfactual aspects of our representation.[24]

Sider has suggested a proposal along these lines for the case of coinciding objects, rejecting monadic properties and replacing with them with symmetric

[24] This, at least, is the situation until one considers the fall of parity. We do not have a merely conventional asymmetry if laws of nature are sensitive to chirality. Instead, there is a metaphysical asymmetry, namely a difference in interaction patterns amongst members of the congruence classes. This gives rise to metaphysical arbitrariness. Either one adopts an absolutist approach, in which case one recognises two distinct worlds that merely differ in terms of the chirality of the laws. Or one adopts a relationalist approach, in which case there is only one world yet one in which there is underdetermination and thus bruteness. Accordingly, one either ends up with arbitrariness or with bruteness.

relations of the form 'being opposite-sortal F', thereby making coincidence compatible with strong supervenience (cf. Sider: 2008).[25] Since these relations are symmetric, any B-preserving mapping will preserve the opposite-sortal relations amongst coinciding objects. Moreover, these relations are introduced so that they correspond to the kind of situation which we ordinarily describe as involving two objects that are coincident such that exactly one of them falls under sortal F. As a result, they provide the required asymmetries at the level of ordinary discourse to justify the claim that there is both a lump and a statue that coincide.

To make sense of this solution, we need to "distinguish between a *fundamental* [sortal] language and an *ordinary* [sortal] language. The former is well-suited to describe the underlying reality (a network of [sortal] relations and no [sortal] properties); the latter is metaphysically second rate, but it is the language we ordinarily speak" (Sider: 2008, p. 618).[26] Although the monadic sortal properties are conceptually prior, the sortal relations are metaphysically prior and function as truth-makers for claims about monadic sortal properties in ordinary language (cf. Sider: 2008, pp. 617-622). Given this conceptual priority, sortal relations can best be explained in terms of the monadic sortal properties we ordinarily talk about.

> x and y are *same-sortal F* iff x and y are identical or coincident, and everything to which either is identical or coincident is of the sortal F
>
> x and y are *opposite-sortal F* iff x and y are coincident and exactly one is of the sortal F

What is grounded in the nonsortalish properties is not the sortalish properties S and L, but the symmetric relations 'being opposite-sortal S' and 'being opposite-sortal L'.[27] The coinciding objects stand in both of these relations to each other. Since these relations are symmetric, there is no underdetermination and hence no reason to posit a brute or indeterminate distribution. There is no difference between x and y and thus no need to ground a difference.

[25] Sider's suggestion concerns modal relations such as 'being opposite-possibly F'. We can adapt this to the sortal case, replacing monadic sortal properties by sortal relations.

[26] Sider's use of the label 'fundamental language' is potentially misleading. What distinguishes these two languages is not a contrast within the factual, namely that one is restricted to the fundamental whereas the other also includes the derivative, but instead the contrast between a language that is entirely factual and one that also includes the nonfactual. (Sider slides back and forth between these two characterisations. At times he speaks of the ordinary language as being 'metaphysically second-rate' and characterises the fundamental language as being concerned with what 'really exists', which suggests the factual/nonfactual contrast, yet he also characterises the contrast in terms of what is 'more fundamental' and 'less fundamental' and speaks of the monadic predicates as being 'metaphysically posterior', which suggests the fundamental/derivative contrast.)

[27] These relations must be co-ordinated in order to adequately distribute the incompatible sortalish properties (cf. Sider: 2008, p. 617 footnote 10).

Since coinciding objects do not differ in properties, it is not possible to appeal to Leibniz's Law to establish their distinctness.[28] Nonetheless, these relations imply that there are coincident objects. The 'opposite'-relations by their very nature require two distinct relata. The irreflexive yet symmetric relations that x and y bear to each other are weakly discerning relations and thus suffice for distinctness (cf. Quine: 1976).[29]

Whilst everything is determinate at the level of reality, semantic indeterminacy arises. The symmetric relations underdetermine the truth of certain claims made in ordinary language. Unlike in the case of the first solution, there is no commitment to ontic indeterminacy. Instead, there is only semantic indeterminacy pertaining to our ordinary talk about coinciding objects. The first and the third solution thus agree that there are two objects that fall under different sortals, without there being a fact of the matter which object falls under which sortal. While the first solution construes this situation as involving ontic indeterminacy, the third solution banishes indeterminacy to the level of representation, leaving reality fully determinate.

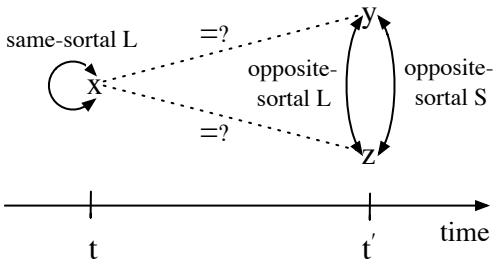
Whether indeterminacy can be banished from reality altogether is, however, questionable. Cases of temporary coincidence give rise to difficulties. If a lump exists at t and is then formed into a statue at t′, such that a lump and a statue coincide at this later time, it is not clear that the object existing at t is determinately identical to one of the objects existing at t′. On the present proposal the switch from there not being coinciding objects to there being coinciding objects is not simply a matter of there being an additional object. Rather than the switch consisting in there first being only a lump and then both a lump and a statue, there is a switch from there being one object that stands in the same-sortal L relation to itself to there not being anything that stands in the same-sortal L relation but instead there being two objects that stand in the opposite-sortal L and the opposite-sortal S relations to each other.[30]

This raises the seemingly unanswerable question: to which thing existing at

[28] Though cf. Sider: 2008, p. 621 footnote 13.

[29] It might be objected that weakly discerning relations presuppose distinct relata and thus cannot ground their distinctness (cf. French: 2015, section 4). This would be rather troubling in the context of the grounding problem since what is at issue is establishing distinctness. However, having a sufficient condition for distinctness suffices for the pluralist and weakly discerning relations clearly imply distinctness, even if they should fail to ground distinctness. Moreover, one can argue that what grounds distinctness are the properties of the parts that are such as to give rise to a system characterised by weakly discerning relations. Appealing to weakly discerning relations should thus be less controversial in this context, than in the case of Max Black's indiscernible spheres as well as in the case of entangled fermions.

[30] It is worth noting that there are no reflexive relations at t′ that differentiate the coinciding objects. In particular, it is not the case that one object is same-sortal L and the other same-sortal S. This is because the reflexive same-sortal L relation requires everything to which its relata are identical or coincident to be of the sortal L, which clearly is not the case when a statue and a lump coincide.



t′ is the thing that exists at t identical? Nothing differentiates the two objects at t′ that stand in the opposite-sortal relations to each other. Whatever speaks in favour of one being identical to the object existing at t also speaks in favour of the other being identical. Diachronic identity is thus underdetermined and either ends up being ontically indeterminate or brute. Put differently, since identity is a one-one relation, it will privilege one of the coinciding objects existing at t′. Any differential treatment of the coincidents is, however, underdetermined and consequently implies bruteness or indeterminacy.

If diachronic identity is indeterminate, then indeterminacy cannot be restricted to the level of ordinary discourse and one might as well opt for an indeterminate distribution to begin with. Likewise, if diachronic identity is brute, then coincidents no longer turn out to be symmetrically positioned, which suggests that one might as well opt for primitivism altogether. Claiming that it is a brute fact that x is L rather than S is no more problematic than claiming that it is a brute fact that x persists as y rather than z. Accordingly, one cannot avoid underdetermination but faces the same predicament that led to the 'no fact of the matter' and 'brute fact of the matter' solutions.[31]

Similarly, the question arises in cases of permanent coincidence what a non-coinciding lump shares in common with a coinciding lump. In one case, there is one object that stands in the same-sortal L relation to itself. In the other, there are two objects that stand in the opposite-sortal L and opposite-sortal S relations to each other. It would appear that they do not share any properties in common. Nor do they stand in the same relations. Accordingly, there is nothing that makes both of them lumps. (Any property/relation that is shared by the non-coinciding lump and the coinciding 'lump' will also be shared by the coinciding 'statue'.) The question as to what makes it the case that there is a lump in each scenario lacks a uniform answer. (This is not to be understood as asking what grounds

[31] One might try to recover symmetry by introducing the relation 'opposite-identical', where x stands in this relation to y and z iff y and z are coincident and x is identical to exactly one of them. This allows one to say in ordinary language that the lump at t is determinately identical to the lump at t′. However, it involves banishing diachronic identity from reality. The revisionist commitments would then not be restricted to our understanding of sortals but would also affect identity and other relations such as resemblance.

the existence of a lump but as asking what the existence of a lump even consists in.) What it is for there to be a lump turns out to be rather disjunctive and disunified. The existence of a coinciding lump involves radically different properties and relations than the existence of a non-coinciding lump. Intuitively, however, we want to say that the non-coinciding and coinciding lumps share certain properties/relations, that there is something that makes both of them lumps, and that a non-coinciding lump can be a lump in the same way as a coinciding lump.[32]

The general problem is that, though one can avoid underdetermination by characterising coinciding objects in terms of symmetric relations, one also needs an account of the relations connecting them to other objects, especially to non-coinciding objects. This is problematic since one cannot introduce such relations without undermining the desired symmetry and thereby raising the spectre of underdetermination once again.

3.4 Collective systems

To preserve strong supervenience one has to show that the distribution of sortalish properties is not underdetermined. One can do this by modifying one's ontology so that it mirrors the features that strongly supervene. By including in one's ontology only those facts that are supervenient, one avoids underdetermination.

One can treat the system of coinciding objects as the bearer of the relevant properties. Sortalish properties are then collective (non-distributive) properties that are attributed to the system rather than to the individual coinciding objects. By treating the system as the bearer of the properties, one no longer has to asymmetrically distribute the two properties 'being a statue' and 'being a lump' amongst the coinciding objects. Instead of two separate properties, there is one collective property, namely the property of being a statue/lump system, that is attributed to the system of coinciding objects. The sortalish properties that seemed to require an asymmetric distribution become collective properties of the system.[33] Such plural properties are not sensitive to permutations of individuals and, accordingly, strongly supervene. Pluralities are mapped when assessing for property-preserving isomorphisms of such plural properties, ensuring that supervenience is not violated.

> the yy's form a *statue/lump system* iff the yy's coincide and one of the yy's is a statue and one is a lump

[32] This is particularly problematic when the very features that ensure that an isolated lump falls under this sortal are also had by a coinciding lump. Even more pressing are cases in which the 'lumps' only differ extrinsically, e.g. where a non-coinciding lump differs merely in terms of its history from a coinciding lump because the latter, but not the former, was shaped with the right kinds of intentions for it to coincide with a statue. Such lumps are intrinsic duplicates, yet the extrinsic difference suffices to ensure that they are lumps in very different ways.

[33] Reconceptualisation at the level of objects thus also implies reconceptualisation of properties. One switches from properties of individual objects to properties of systems.

the yy's form a *lump system* iff every y that is one of them is a lump[34]

These systems function as truth-makers for claims made about individual objects in ordinary language. The yy's form a statue/lump system if in ordinary discourse we would say that there are coinciding objects, one of which is a statue and the other a lump. Although the system does not fix which is which, this is unproblematic since the assignment of sortalish properties to individual objects is not a factual matter that reflects reality, but merely pertains to our ordinary ways of (mis)representing cases of coincidence. We are dealing with a system that instantiates a collective property, but that is misrepresented as involving an asymmetric distribution amongst individuals. Underdetermination is restricted to the level of representation and does not imply a failure of supervenience at the level of reality.

Whether this approach is a genuine form of pluralism depends on how exactly these statue/lump systems are understood. On the approach briefly sketched here, the system involves a plurality of objects. Since coinciding objects do not have incompatible properties, on this proposal, one cannot establish their distinctness by appealing to Leibniz's Law. Yet, one can nonetheless establish pluralism since the property of being a statue/lump system is a non-distributive plural property that requires a plurality of objects. The distinctness of the coinciding objects is not established at the level of individual but instead plural predication. Alternative approaches that treat the system as a single object, rather than as a plurality, will not recognise distinct coinciding objects in their factual language, but will only countenance pluralistic commitments at the level of ordinary discourse.[35]

However the details are worked out, the problems that undermine the proposal in terms of symmetric relations also arise in this context. The threat of underdetermination reappears when one considers temporary coincidence, or compares a coinciding with a non-coinciding lump. These cases break the symmetry amongst coincidents that was established by considering them to form a system. First, the non-coinciding lump existing at t is identical to only one of the components of the statue/lump system at t' but not to the other. Second, the non-coinciding lump seems to share something in common with only one of the components of the statue/lump system but not with the other. Since nothing accounts for the requisite symmetry-breaking, one ends up with indeterminacy or bruteness.

4 Conclusion

There are four possible solutions to the grounding problem. Either the underdetermination of the distribution of sortalish properties is accepted. One can then consider the distribution to be either indeterminate (solution 1) or to be brute

[34] The yy's can be a degenerate plurality consisting of only one object.

[35] This approach is similar to the 'summing defence' suggested by Hawley: 2009, section 3.3.

(solution 2). Alternatively, underdetermination can be rejected as not being genuine. One then has to explain away the apparent asymmetries. This can be done either by rejecting the need to distribute asymmetrically on the basis that there are only symmetrical sortal relations in reality (solution 3), or by rejecting the need to distribute sortals asymmetrically across coinciding objects, instead attributing them to the system of objects (solution 4).[36]

The third and fourth solutions collapse into variants of the first and second solutions in the case of coinciding objects, due to cases of temporary coincidence and cases of non-coinciding lumps. Pluralists are thus left with a choice between indeterminacy and bruteness. Given that indeterminacy is not restricted to the distribution of properties but also infects identity, whereas the requisite bruteness is restricted and relatively unproblematic, the latter option is preferable. Pluralists should be primitivists about the distribution of sortalish properties.[37]

[36] Analogous solutions apply to other asymmetrical systems that admit of non-trivial automorphisms. For instance, in the quantum case one can accept: 1. indeterminate spin properties but a determinate property of the system to the effect that the particles possess opposite spins, 2. primitive spin properties, 3. a theory that only countenances irreducible opposite-spin relations and no monadic spin properties, 4. a structuralist account that attributes collective spin properties to the system. Although the problem and the space of possible solutions are structurally the same in all these cases, the solutions have differential plausibility. For instance, the third and fourth solutions might work for i and $-\mathrm{i}$, since there is neither an analogue of temporary coincidence nor of a non-coinciding lump in the case of the complex number field. Moreover, there is less pressure to conform to our ordinary understanding of objects and properties in this context than there is in the case of statues and lumps, rendering revisionary proposals, such as a structuralist account of numbers according to which being a given number amounts to occupying a certain place in a number field, less radical. Similarly, in the case of chiral properties (and spin properties), the symmetric relations 'same-handedness' and 'opposite-handedness' generate a partition into two congruence classes, which ensures that these relations are co-ordinated not just locally but globally, unlike in the statue/lump case where the same-sortal and opposite-sortal relations only hold amongst coincidents and not across different coincidents. Moreover, by rejecting cross-world handedness relations one can argue that a lonely hand lacks an orientation and is neither left-handed nor right-handed.

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