# Fine's Monster Objection Defanged

Damiano Costa, Alessandro Cecconi, Claudio Calosi

*This is the final version of an article accepted for publication in Philosophical Quarterly.*

'Accursed creator! Why did you form a monster so hideous that even you turned from me in disgust? '

Mary Shelley, *Frankenstein*

**Abstract.** The Monster objection has been often considered one of the main reasons to explore non-standard mereological views, such as hylomorphism. Still, it has been rarely discussed and then only in a cursory fashion. This paper fills this gap by offering the first thorough assessment of the objection. It argues that different metaphysical stances, such as presentism, three- and four-dimensionalism, provide different ways of undermining the objection.

**Keywords**. Monster objection; Standard mereology; Hylomorphism; Presentism; Three- and four-dimensionalism; Temporary Mereology.

## 1. Introduction

Are composite objects mere sums of their parts? No, says the hylomorphist, who takes at least some of them to be *structured wholes* comprising *both a material and a formal* component. Yes, says the standard mereologist, who takes composite material objects to be unstructured mereological sums (Varzi and Cotnoir 2021, § 5.3).

After years of apparent oblivion, hylomorphism is firmly back on center stage of philosophical inquiry (Fine 1982; 1999; 2010; 2017; Johnston 2006; Koslicki 2008; 2018a; Koons 2014; Lowe 2006; Marmodoro 2013; Marmodoro and Paoletti forth.*;* Rea 2011; Sattig 2015; forth.). While this revival of hylomorphism is nowadays justified by a battery of arguments and by the success of its applications (Fine 1999; 2010; Koslicki 2018b; Morganti forth.; Rea 1998; Sattig 2015), there is one remarkable argument, to which hylomorphists often appeal. It is said to be a fatal threat to standard mereology (Koslicki 2008), and one of the main reasons to adopt an alternative, hylomorphic, conception of material objects. It is, of course, Fine's infamous Monster Objection (Fine 1999).[1]

The objection, in a nutshell, is that standard mereology entails plain falsehoods, such as that a ham sandwich, say, exists before being assembled, or that mereological monsters such as the sum of Cleopatra and the ham are parts of the sandwich just as much as the ham itself is. Proponents of the objection take such falsehoods to be due to the insensitivity of standard mereology to *structure*. The ham-sandwich---so the thought goes---has *a certain structure that imposes significant constraints*: it prevents the sandwich from existing when its ingredients are not properly assembled and prevents it from having monsters-like objects as parts. Hylomorphism is explicitly designed to provide such sensitivity to structure and seems therefore equipped to escape the Monster Objection.

Despite its importance, very little effort has been made to properly analyze and evaluate the effectiveness of the Monster Objection.[2] This paper aims to fill this gap in the literature. It

1 Or so is considered for example by (Koslicki 2008; Sattig 2015; Jacinto and Cotnoir 2019; Cotnoir and Varzi 2021; Arlig 2005). Of course, there are other arguments in favour of hylomorphism, such as that from mereological coincidence (Fine 2003). It is a substantive question whether this argument applies only to *ordinary* material objects in some philosophical sense of the term (see e.g. Sattig 2015; Wachter and Ladyman 2019) or whether it has a broader scope. For instance, Fine thinks that it applies to molecules of water as well (Fine 1999: 74).

2 Notable exceptions include Koslicki (2008) and Sattig (2015)---more on this later.

provides the first systematic analysis of the objection and its target. It also sets forth different responses to it that rely on established metaphysical views. The rest of the paper is structured as follows. We begin by identifying the polemical target of the Monster Objection (§ 2). We move on to our presentation of it and present four replies (§ 4). We conclude with an overview of our results (§ 5).

## 2. What is 'standard mereology'?

The Monster Objection is an objection against 'standard mereology'.[3] Fine himself characterizes it as follows:

> Thus, if I am right, it is only by abandoning our usual conception of material things as [i] relatively unstructured, [ii] completely unconceptual, and [iii] ontologically limited in their nature that we can attain a proper understanding of what they are (Fine 1999: 74).

Let us try to get a firmer grasp on the three aspects of the view singled out above.

[3] One might think that here 'standard mereology' simply stands for one of the axiomatic systems that are routinely assumed today, such as Classical Extensional Mereology (different axiomatizations of it are provided for example in Cotnoir and Varzi 2021). For reasons we explore below, this would be inaccurate. With 'standard mereology', Fine refers to a *family* of metaphysical views that share some elements to be discussed below. Note that Fine calls them 'standard mereological conceptions', in the plural (Fine 1999: 62). It is also clear, in context, that he doesn't take such conceptions to be exhausted by the endorsement of a particular axiomatic system. We simply follow suit.

## 2.1 Unconceptuality

Fine constrasts "conceptual" with "physical" (69) and "material" (73) and equates it with "abstract" (69) and "intensional" (73).[4] The latter terms are used in a hylomorphic context, to characterize the formal element of a material thing – an attribute or a function (73). Whether an object is unconceptual or not depends on the presence or absence of this formal element. Hence, something is completely unconceptual if and only if it has no attribute or function as a part or constitutive element (Fine 1999: 73). By contrast, a hylomorphic compound has an attribute or a function as a part or constitutive element – the form.[5] This constitutive element is not supposed to be just a mere additional part, but to contribute in a distinctive way to the constitution of the object.[6]

## 2.2 Unstructuredness (and Flatness)

To spell out how standard mereological wholes are unstructured, Fine uses a set-theoretic analogy.[7] He writes:

[4] One might take here 'intensional' to contrast with the extensionality of proper parthood. We suspect that this is not the sense in which Fine takes it, insofar as the form of a hylomorphic compound is taken to be a part of the compound.

[5] Not all wholes that have an attribute or function as a part are hylomorphic compounds. A mere sum of some material components and an attribute would not do and would not constitute a significant departure from standard mereology. Better, we don't take it to be a departure from standard mereology at all, in light of the fact that a mere sum containing an attribute is considered by Fine as one of the alternative ways in which a standard mereologist can conceive a material thing (Fine 1999: 63). In a hylomorphic compound, "the components and the relation do not come together as coequals, as in a regular mereological sum. Rather, the relation R preserves its predicative role and somehow serves to modify or qualify the components" (Fine 1999: 65). Unpacking this special role and its mereological character goes beyond the scope of this paper.

[6] It is a controversial matter among hylomorphists whether forms are to be intended as parts of objects or not. We prefer to remain neutral on this issue here and refer the reader to Johnston (2006) and Heil (*forth.).*

[7] We are indebted to Fine (2010: 571-4) and Cotnoir and Varzi (2021: § 5.3).

> The wood is, as it were, a relatively unstructured version of the tree just as the set {a, b, c, d} is an unstructured counterpart of the set {{a, b}, {c, d}} (…) (Fine 1999: 73).

The analogy features two sets with the same ultimate components. The former is supposed to be the unstructured counterpart of the latter. Consider the structured set {{a, b}, {c, d}}. First, the set itself ---or, more precisely, its nature--- imposes a natural division among the ultimate components into two subsets. Second, it features a hierarchy of members and subsets. Both aspects are absent from the unstructured set. The nature of the unstructured set imposes neither a natural division among ultimate elements, nor a hierarchy of subsets.[8] Fine believes material things to be similar to the structured set and blames standard mereology for treating them as similar to the unstructured one. He writes:

[8] It is instructive to link this to two main set-theoretical notions, i.e. set membership and set inclusion. Set-membership is sensitive to hierarchy and natural division, in that "most sets come with hierarchical structure of members, members of members, and so on" (Cotnoir and Varzi 2021: § 5.3). The hierarchy itself provides a natural decomposition of the whole, along the same lines. By contrast, set-theoretic inclusion is neither sensitive to hierarchy nor to any natural decomposition. The part-whole relations of standard mereology resemble set-theoretic inclusion rather than set-theoretic membership. Cotnoir and Varzi (2021: § 5.3) recognize this explicitly. Fine himself seems to point to this fact in (1999: 72; 2010: § 2). One might protest that we linked standard mereology blindness to structure to *two* different aspects: the sum operation on the one hand, and the fact that it models part-whole relations in a way that resembles set-inclusion rather than set-membership on the other. The crucial point is that these two aspects are not independent. *If* one models parthood relations in a way that it is similar to set-inclusion, *then* one can show that sum---defined in terms of parthood---obeys both idempotence and associativity, thus being blind to hierarchy of levels and repetition. By contrast is one uses set-theoretic membership as a building relation both idempotence and associativity fail---for proofs see Cotnoir and Varzi (2021: §5.3).

> Of course, everyone can grant that some spatial divisions of an object are more natural than others. The division of a car down the middle, for example, is far less natural than the division into an engine, a chassis, and a body. But on the present view, the natural division is intrinsic to the identity of the object in a way that the other divisions are not (Fine 1999: 72).

And about hierarchy he says:

> [..] the majority of material objects, on our account, will submit to a hierarchical division into parts. Just as a car will have an engine, a chassis, and a body as immediate parts (these being the components of the rigid embodiment that is the current manifestation of the car), these immediate parts will themselves have further immediate parts, and so on all the way down until we reach the most basic forms of matter. Thus a material object will be like a set, with its hierarchical division into members, members of members, and so on (Fine 1999: 72).

The absence of hierarchy and natural division reflects the unstructuredness of standard mereology. To see where this unstruscturedness originates, we should take a closer look at the properties of standard mereological summation and, in particular, at associativity, commutativity and idempotence (see Fine 2010: 571-74). Associativity mandates that given two or more objects the resulting fusions are numerically identical to one another no matter which objects are summed first. This is easily appreciated in the context of Classical Extensional

Mereology (CEM) where $\forall x \forall y \forall z\ ((x + y) + z) = (x + (y + z))$ is a theorem.[9] Commutativity mandates that the order in which the operation of sum is applied to objects does not impinge on the identity of the resulting whole. As an illustration consider CEM again:[10] $\forall x \forall y\ (x + y) = (y + x)$ is a theorem. Finally, let us consider idempotence. It mandates that the resulting whole remains numerically identical regardless of the number of times the parts are added together. In CEM $\forall x\ (x + x) = x$ is equivalent to the reflexivity axiom.[11] These features of standard mereological summation make it the case that a hierarchy or a preferred division cannot be singled out.[12] Thus, we may say that standard mereology yields relativitely unstructured objects in the relevant sense because its sum operator has all these three properties. It is in this sense that standard mereology is sometimes said by Fine to yield a *flat* conception of material objects. There is a sense in which flatness *just is blindness to hierarchy and natural division* (Fine 2010: 566). According to standard mereology, composite objects are as flat as pancakes.[13]

---

[9] In effect it is a theorem of every system based on $\leq$, given the definition of sum and the underlying associativity of disjunction (Varzi and Cotnoir 2021: § 5.3).

[10] Again, this is true for any system where $\leq$ is taken as primitive, for it follows from the definition of sum and the associativity of disjunction (Varzi and Cotnoir 2021: § 5.3).

[11] And in systems that accept the equivalence between $x \leq y$ and $x + y = y$ (Varzi and Cotnoir 2021: § 5.3).

[12] If sum is associative then the order in which objects are fused does not make a difference. Therefore, it is not possible to distinguish between immediate and mediate parts which is key to develop a hierarchy of parts and a natural division into parts (Fine 1999: 71-72).

[13] We defer to Cotnoir and Varzi (2021) for a further analysis of the structures to which standard mereology is blind, and to the analysis of this notion in Fine's later works. The reader will have realized that we are here assuming that "ontologically limited in their nature" might refer here either to the absence of an intensional element or to the absence of a natural and hierarchical division into parts of such objects. In light of what we have said above, this means that this kind of limitation is adequately captured by our characterization of standard mereology.

### 2.3 Standard mereology and CEM

We therefore take the target of the Monster Objection – standard mereology – to be *any* mereological theory according to which objects are relatively unstructured and completely unconceptual – in the senses specified above. A notable example of such a theory is CEM. However, it is crucial to realize that standard mereology is in fact a *family* of mereological theories – a family of "standard conceptions" as Fine (1999: 62) puts it – of which CEM is just a prominent member. If you consider the mereological theory that results from the removal of some axioms of CEM, such a mereological theory would still be an instance of standard mereology, as long as 'its wholes' remain relatively unstructured, completely unconceptual, and ontologically limited in their nature.[14] For example, one axiom of CEM, that will turn out to be crucial later on, is *unrestricted composition* (roughly there is a mereological sum for any non-empty plurality of things). It should be clear that rejecting it does not entail going beyond standard mereology as we characterized it. This is because this rejection would impact the *number* of existing sums and *not their nature*; whenever there is a composite object, it will still be completely unconceptual and relatively unstructured.

This interpretation of standard mereology partially contrasts with previous ones. For example, it contrasts with that of Koslicki, who takes the target of the Monster Objection to be exactly CEM (Koslicki 2008: 19-20), thus including unrestricted composition. Our interpretation also contrasts with that of Sattig (2015: 12). Sattig takes the target of the Monster Objection to be the standard Lewisian four-dimensional view of objects, namely a view that combines mereological elements – such as CEM, tenseless mereology and the claim that ordinary objects are mere sums of their parts – with metaphysical ones – such as perdurantism. Their reading

[14] Here, we do not offer an independent argument for the unconceptuality of CEM wholes. However, we take it to be a consequence of both its standard interpretation and its formal framework. For according to the former abstract entities are not taken to be parts. According to the latter, even if they were parts, there would be no distinctive way in which they contribute to the constitution of objects. Hence, they would not count as formal components.

does not come without textual support, but neither does ours, as shown above. Moreover, their reading makes the target of the Monster Objection – a rejection of CEM or of the Lewisian view of objects – much more limited than what we take it to be.

In any case, after presenting our ways of deflecting the Monster Objection in § 4, we shall review them in § 5, and make it clear to what interpretation of standard mereology they are applicable – and some of them apply even if standard mereology is taken to be CEM or the Lewisian view.

## 3. The Monster Objection

Consider a ham sandwich and the ingredients which make it up: two slices of bread and a piece of ham. What is the sandwich? And what is its relation to its ingredients?[15] The bottom line of the Monster Objection is that, in answering those questions, standard mereology ends up entailing plain falsehoods.[16] Let us, then, review these answers.

---

[15] In the original formulation, Fine begins with a different question: what is it for *x* to be part of *y*? However, Fine himself claims that the Monster Objection does not concern the nature of parthood only, but, more generally, of parts and wholes and their relations. In his words, "We conclude that neither conception of mereological sum, as aggregate or compound, yields a satisfactory account of the ham sandwich or its parts" (Fine 1999: 64).

[16] The overall structure of Fine's argument is as follows. Fine proposes four possible answers to the question, 'what is the sandwich?', that a standard mereologist could give and argues them to be unsatisfactory. We shall call this encompassing argument the Monster Objection. Fine provides different arguments against each of these four answers. Some authors reserve the name 'Monster Objection' for the argument against Answer 3 (Koslicki 2008; Sattig 2015; Jacinto and Cotnoir 2019). Koslicki (2008: 72) calls the argument against Answer 1 the 'Aggregative Objection'. In this paper, we are interested in Fine's more general case against standard mereology and therefore discuss all four answers.

**Answer 1**

($A_1$) The sandwich is a mereological sum of its ingredients[17]

Fine argues that this answer delivers the wrong *existence conditions* for the sandwich. For a mereological sum exists at any time at which either (i) at least one, or (ii) all, of its parts exist.[18] Now, usually, all the ingredients of a sandwich exist before its assembly. And this implies that also the sandwich exists before being assembled, which is absurd.

**Answer 2**

Presumably, the sandwich fails to exist when the ingredients are scattered because they lack the proper arrangement. What if we add *it* to the sum, as a trope? Accordingly,

($A_2$) The sandwich is a mereological sum of its ingredients and an arrangement-trope.

Fine points out that the success of this proposal depends on our views about the spatiotemporal profile of tropes. Where and when a trope exists is no simple question, especially when it comes to relational tropes. And even if the proposal delivers the right existence conditions, "it is hard to believe that [the trope] is a part in the same way as the standard ingredients" (64).

---

[17] What is for $x$ to be a mereological sum of the *ys*? Standard mereology gives several answers to this question. Here is one: $x$ is a sum of the *y*s iff every $y$ is part of $x$, and every part of $x$ overlaps one of the *y*s. (Hovda 2009: 6). Our analysis does not hinge on a particular definition of mereological sum. Moreover, Fine himself takes the operation of sum as primitive and defines parthood in terms of it.

[18] These are of course two exclusive options. Fine discusses two different notions of sums which obey the two existence conditions under discussion, aggregates and compounds---see §4.2.

**Answer 3**

Even if a mereological sum of all ingredients could exist before being assembled, it is a sandwich only for a limited amount of time. This suggests the following:

($A_3$) The sandwich is a mereological sum of the restriction of the ingredients to the time *t* at which the sandwich exists.

How to make sense of the restriction of an object to a time depends on our metaphysics. Four-dimensionalists will presumably take the restriction to be a *temporal part* of the object. Three-dimensionalists are less used to talk about temporal restrictions, but they are not left without options.[19] (Anyway, if we can't make sense of temporal restrictions in a suitable way, then $A_3$ will have to be rejected.[20] This squares nicely with Fine's aims.)

[19] There are at least three options at the three-dimensionalist's disposal. One first possibility is to consider the restriction of an object at a time as a *qua*-object. That is, the restriction of *x* at *t* is *x* qua *F*, being *F* the property of existing at *t*. Another possible interpretation is to follow Gilmore (2006) and take the restriction of *x* at *t* as a temporal segment of *x*. Thus, the temporal restriction of *x* at *t* would be a *y*, such that *y*'s path is a proper subregion of *x*'s path and *y* shares all matter with *x* through its path (Gilmore 2006: 206). The last option that came to mind is to take temporal restriction as a function that takes an entity, *x*, and a time, *t* and gives back the entity itself. After all, a three-dimensional object is wholly present at each time of its persistence. (Of course one might also take an object to be a variable embodiment and its temporal restrictions to be rigid embodiments. But this would mean buying into a hylomorphic view and abandoning standard mereology.) This is by no means an exhaustive survey of the 3D accounts of temporal restriction, nor we take these interpretations to be unproblematic or uncontroversial (for example, the first option would alarmingly look similar to a variant of hylomorphism, while the third would arguably deliver the wrong existence conditions again).

[20] To illustrate, we mention here three worries about the notion of temporal restriction in this context. (i) The notion does not make sense at all (e.g. a 3D who is not persuaded by any of the proposed interpretations). (ii) The chosen interpretation delivers the wrong existence conditions for objects. (For example, this would be the case if

$A_3$ might deliver the right existence conditions for the sandwich. However, it entails absurd mereological consequences. To see this, notice that the ham now enters the sandwich insofar as the sum which is the sandwich contains *the restriction of the ham to t* as one of its elements. This is the sense in which the ham can still be said to be a part of the sandwich. However, in that very sense, also other things which are not parts of the sandwich will turn out to be parts of it. Enter the monster, i.e., the mereological sum of the ham and Cleopatra. At the time *t* of the sandwich, what exists of the monster is nothing other than the ham. Hence, the restriction of the monster to *t* is nothing but the restriction of the ham to *t*. But the restriction of the ham to *t* is one of the elements of a sum to which the sandwich is identical. Therefore, the monster is going to be a part of the sandwich just as its ingredients are, which is absurd.

**Answer 4**

So far, we have worked with a timeless notion of parthood – *x* is part of *y*. Let us now try to work with a temporary notion of parthood – *x* is part of *y* at *t*.[21] In that case, all our mereological notions would have to be temporally qualified. And so should be the notion of mereological sum – *y* is a sum of the *xs* at time *t*. If so, the natural suggestion is:

($A_4$) The sandwich is a mereological sum of its ingredients at time *t*.

---

the last interpretation of a temporal restriction mentioned in the previous footnote is adopted. Indeed, in that case the restriction of the ingredients at any time will be nothing other than the ingredients themselves. Hence, a sandwich will end up existing before being properly assembled). (iii) The resulting account A3 would be circular, for in accounting of what the object is, it refers to a time, which in turn is identified by referring to the object itself (for t is the time *of the object's existence*).

[21] On timeless vs temporary mereology, see e.g. Simons (1987), and Sider (2001).

$A_4$ is (or at least *looks*) different from $A_3$, insofar as (i) it does not make use of temporal restrictions, and insofar as (ii) its mereology is temporary and not timeless. However, $A_4$ entails the same absurd mereological consequences of $A_3$. To see this, notice that the piece of ham is now part of the sandwich in the sense that *the ham is part of the sandwich at time t*. However, as Fine notes, for $x$ to be part of $y$ at time $t$ is for the restriction of $x$ to $t$ to be part (in the timeless sense) of the restriction of $y$ to $t$. In other words, temporary parthood is defined in terms of timeless parthood. To illustrate, consider what this means in a four-dimensionalist setting: the ham is part of the sandwich at $t$ insofar as the temporal part of the ham is part (timelessly) of the temporal part of the sandwich – which is correct (Sider 2001; Cotnoir and Varzi 2021). That considered, it should be clear why $A_4$ entails the same absurd mereological consequences of $A_3$. Consider the monster. We have already seen that the restriction of the monster to $t$ is nothing other than the restriction of the ham to $t$. Hence, the monster is going to be a part of the sandwich just like the ham is – again.

Standard mereology, Fine concludes, seems unable to account for the nature of the sandwich and for its relation to its ingredients, either because its answers deliver the wrong existence conditions for the sandwich (the sandwich could exist before being assembled), or because they entail absurd mereological consequences (the monster is part of the sandwich just like the ham is). This is of course a modus tollens against standard mereology. But it might also turn out to be a proper or improper part of an argument in favour of hylomorphism, insofar as – hylomorphism alone is able to account for the nature of the sandwich.

## 4. Taming the Monster

In what follows, we shall discuss four replies to the Monster Objection (§ 4.1-4). All these replies rely on popular metaphysical theories, such as four-dimensionalism or presentism.

Adherents to these theories will find it natural to adopt the strategy that stems from their own view. Note that it is *not* our aim to defend a particular way out from the Monster Objection. We just want to offer a comprehensive (but not exhaustive) picture of the ways in which the objection can be resisted by remaining in the frame of standard mereology. This general picture is enough to motivate the claim that the Monster Objection is not, as Koslicki (2008: 75) puts it, "fatal for the standard conception of mereology as it applies to ordinary material objects".

### 4.1 The Four-dimensionalist Reply

Four-dimensionalists will take Answer 3 on Fine's list to be particularly appealing. For they take the sandwich to be a four-dimensional entity, composed by some of the temporal parts – the temporal restrictions – of its ingredients. However, according to the Monster Objection, a sandwich can't be a sum of the restriction of its ingredients. For this option entails incorrect mereological consequences, such as that, crucially, the monster is part of the sandwich *just like the ham*.

But is the ham part of the sandwich, in any privileged sense? The answer might seem obvious. But it is not obvious at all. Especially for the aforementioned four-dimensionalist. If four-dimensionalism is true, the ham is a four-dimensional entity. Its later temporal parts contribute to form the sandwich. But it exists earlier than the sandwich. And hence some of its temporal parts exist before the sandwich. If you consider the ham – the *whole* four-dimensional ham – you will therefore realize that the ham *overlaps* the sandwich, for they have parts in common (the ham's later temporal parts). But the ham is definitely *not* a part of the sandwich, for there is a part of the ham that extends outside – earlier – the sandwich and is not mereologically included in it. As four-dimensionalists never tire of saying, what *is* a part of the sandwich is not the ham, but rather a temporal part of the ham.

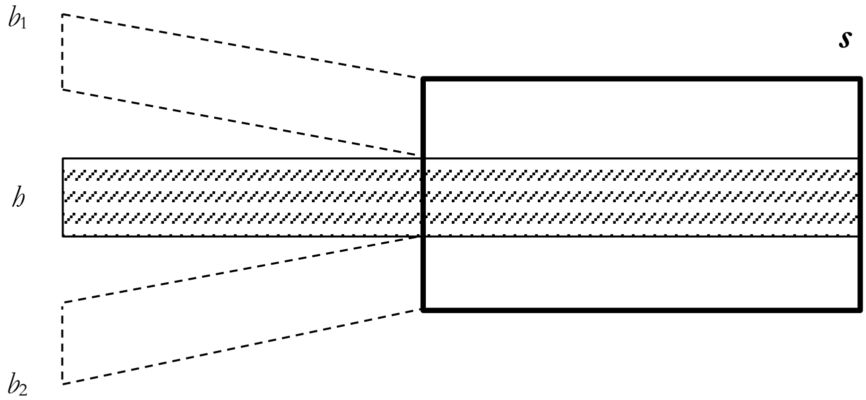


**Figure 1.** From a four-dimensionalist perspective,

the ham ($h$, striped background) is *not* part of

the sandwich ($s$, thick boundary), it merely overlaps it.

From the four-dimensionalist point of view, the belief that the ham is part of the sandwich is not the result of reliable intuitions, but of a three-dimensionalist bias that should be rejected. Once this bias is exposed and rejected, the Monster Objection loses its bite. For it rested on the assumption that, in some sense, the ham is part of the sandwich and the monster isn't. If four-dimensionalism is true, none of them is part of the sandwich. And none is mereologically related to the sandwich in a special and exclusive way: both of them have a part in common with the sandwich, and that's it. Standard Mereology is not to blame for failing to account for a difference that is not there. We call this the Four-dimensionalist Reply to the Monster Objection.[22] (One might object that claiming that the ham is not, strictly speaking, a part of the sandwich, offends irremediably against common sense, and is therefore a consequence that should be rejected at all costs. For reasons that will soon become obvious, we postpone the

[22] We remark that in principle this response might be given by anyone who rejects the intuition that the ham is part of the sandwich (thanks to Fine for this point). Still, we take this option to be a natural one to take for a four-dimensionalist.

discussion of this possible rejoinder to § 5. Suffice it to say that some of our replies below consist in the adoption of views that are usually considered to be as close common sense as one can be).

### 4.2 The Temporary Mereology Reply

The fourth answer considered by Fine consists in shifting from timeless – $x < y$ – to temporary mereology – $x <_t y$. On this view, the sandwich is the mereological sum of its ingredients at a given time: $S_t$ $(s,b_1,b_2,h)$. This fourth answer should be particularly appealing for a three-dimensionalist, who tends to relativize instantiation to time for independent reasons, i.e., as a response to the problem of temporary intrinsics. According to Fine, this fourth answer has the same problematic consequences of the previous one: the monster is going to be part of the sandwich just like the ham is. To recall, under this proposal, the ham is part of the ham *at a given time* – $h <_t s$. Moreover, temporary parthood is to be defined in terms of timeless parthood. That is, $x$ is part of $y$ at $t$ iff the restriction of $x$ at $t$ is (timelessly) part of the restriction of $y$ at $t$: $x <_t y := x_t < y_t$. And if this definition is accepted, we have indeed a good reason to believe that the monster is part of the sandwich. For, as we noted earlier, the restriction of the monster at $t$ is nothing but the restriction of the ham at $t$. So, the monster is part of the sandwich just like the ham is.

Here, we would like to focus on the proposed definition of temporary part in terms of timeless part. The *only* reason that we have to conclude that the monster is part of the sandwich rests essentially upon this definition. Is the definition correct? *Most* four-dimensionalists would accept it. For they usually say that $x$ is part of $y$ at $t$ iff the temporal part of $x$ at $t$ is (timelessly) part of the temporal part of $y$ at $t$ (Sider 2001: 57; Cotnoir and Varzi 2021: § 6.2). But *some* four-dimensionalists might want to reject it. As explained by Sider (2001: 57), a four-dimensionalist might have good reasons to prefer her mereology to be *primitively* temporary. Moreover, and more crucially, most three-dimensionalists would not accept the proposed definition. Instead, they would take their mereology to be primitively temporary, or at least irreducible to timeless mereology.[23] This should not come as a surprise. For temporary parthood is a temporary attribute. And most three-dimensionalists take temporary attributions to be irreducible to timeless ones.[24]

If mereology is taken to be irreducibly temporary, the definition of temporary part in terms of timeless part is to be rejected. Moreover, since the *only* reason we had to conclude that the monster is part of the sandwich rested essentially upon this definition, once this definition is gone, this reason disappears with it. There is no reason anymore to conclude that the monster is part of the sandwich at *t*. Or, if there is, it is still forthcoming, and the burden of proof now lies on the upholder of the Monster Objection. We call this the Temporary Mereology Reply to the Monster Objection.[25]

Though we take the burden of proof to lie on our opponent's side, we here sketch a reason for thinking that the monster cannot be a temporary part of the sandwich, at least if three-dimensionalism is assumed.[26] The first step of our sketch consists in noting that Fine distinguishes two notions of sums acceptable within standard mereology, namely *compounds* and *aggregates*. These two notions correspond to the existence conditions outlined before. A

---

[23] Primitivists include Thomason (1983), Simons (1987: §5.2), Sider (1997; 2001), Hudson (2001), Bittner *et al.* (2004) (followed by Bittner and Donnelly 2007: Donnelly and Bittner 2009; Donnelly 2009; 2010), Masolo (2009), Giaretta and Spolaore (2011), and Hovda (2013: §1.2).

[24] Some solutions to the problem of temporary intrinsics temporalize the attribute itself. Exemplification there can be timeless. Still, the mereological predicates of timeless mereology are not thus temporally qualified.

[25] Sattig (2015: 4) remarks that three-dimensionalists usually would take temporary parthood as a primitive. However, later on, he does not discuss this as opening a possible way out of the Monster Objection.

[26] After all, if one is not a three-dimensionalist, we expect her to naturally lean towards the four-dimensionalist reply in § 4.1.

compound exists at, and only at, those times at which *all* its parts exist, while an aggregate exists at, and only at, those times at which *at least one* of its parts exists. We expect a three-dimensionalist to discard aggregates from her ontology. Indeed, Fine himself notices that aggregates are "spread out through time in much the same way as a material thing is ordinarily regarded as being spread out in space" (Fine 1999: 62), and this offends against the three-dimensional claim that persisting objects are not spread out in time (Fine 2006: 699). So, we are left with compounds. We shall now argue that if a compound conception of sum is assumed, the Monster Objection does not get off the ground, for there will be no monster to begin with. Recall that a compound exists at, and only at, those times at which all its parts exist. This seems to correspond to the temporary version of the notion of sum in Simons (1987: 184, CDT16).[27] A compound *c* of *a* and *b* is defined as something that overlaps at *t* all and only those things that overlap at *t* either *a* or *b*, with both *a* and *b* existing at *t*.[28] It should be clear that, given this definition, the monster, if thought of as a compound, does not exist at *t* because one of its elements, namely Cleopatra, does not exist at *t*.[29] The desired consequence now follows, i.e. the monster is not a part at *t* of the sandwich. For, following Simons (1987), we take it that a

27 Note that CTD16 in Simons (1987: 184) is not temporalized---in effect it is universally closed in the temporal variable. We have temporally modified it, following Simon's own template in definition CTD15---which we take to be, roughly, the notion of sum corresponding to Fine's notion of aggregate.

28 Following Simons (2007: 184): *c* SM*t ab* = For every *x*, *x* overlaps *c* at *t* iff *a* exists at *t* and *b* exists at *t* and *x* overlaps at *t* either *a* or *b*.

29 It is worth investigating whether a compound conception of mereological sums prevents by itself the existence of the monster and thus is enough to undermine the Monster Objection from the start. Our argument in the main text does not warrant this stronger conclusion because it takes parthood to be primitively temporary and is therefore silent as to whether a timeless mereology would deliver the same results. Much depends, we suggest, on the correct interpretation of the notion of existence at *t* which features in Fine's definition of a compound.

minimal requirement for an object to be a part at *t* of another object is that they both exist at *t*. In effect, this is what axiom CTD8 in Simons (1987: 179) explicitly states.[30]

It is worth noting here that not all three-dimensionalists would take their mereology to be temporary. We shall discuss two possible or actual examples. The first one concerns three-dimensionalists who are also a presentists (e.g. Merricks 1999). Such three-dimensionalists might in general like to avoid temporalizing attributions to times and to have their attributes exemplified timelessly. The second example, which is probably the most relevant when it comes to the present context, concerns three-dimensionalists who are also fragmentalists. Fragmentalists *might* want to avoid temporalizing attributions to times and have their attributes exemplified timelessly – parthood included.[31] We take both such presentists and such fragmentalists to adopt one of our other strategies. Clearly, such presentists will adopt our Presentist Reply, given below (§ 4.3). As regards fragmentalists, we expect them to endorse some form of restricted composition (§ 4.4). In particular, we don't expect them to believe in the existence of any fragment that contains the Monster – for it is a diachronic sum. In any case, we mention these two examples for the sake of completeness. Even though *some* three-dimensionalists would not like their mereology to be primitively temporary, we still expect *most* of them to do.

[30] Here it is: if *a* is part of *b* at *t*, then *a* exists at *t* and *b* exists at *t* (Simons, 1987: 179). Note that even in the presence of this axiom, the requirement that both *a* and *b* exist at *t* for a compound *c* of *a* and *b* to exist at *t* is not redundant, for the definition of a compound in terms of overlap at *t* contains a disjunction---rather than a conjunction.

[31] We don't take this to be the case of Fine, who we expect takes his facts to be tensed. Indeed, one should carefully distinguished *timeless* mereology - *x* is part of *y* – from *temporary* mereology – *x* is part of *y* at *t* – and *tensed* mereology – *x* is now part of *y*. It is not here the place to discuss about the relationship between them, which remains mainly underscrutinized.

### 4.3 The Presentist Reply

A sandwich can't be a sum of the restrictions of its ingredients to a certain time. For this would entail that the monster – the sum of the ham and Cleopatra – is part of the sandwich just like the ham is.

However, the monster can be part of the sandwich only if it exists in the first place. And if the monster exists, both the ham and Cleopatra must exist as well – for the existence of a sum entails that of its parts. Not only must they exist, they must also form a whole – the monster itself.

Arguably, both these requirements for the Monster Objection, namely that

(i) Both the ham and Cleopatra exist

And that, if (i) is true, then

(ii) There is a sum of the ham and Cleopatra,

are controversial. Let us discuss each in turn. Here we focus on (i) and in the following subsection we focus on (ii).

The first requirement entails the existence of Cleopatra. Now, Cleopatra is a past entity. Hence, the Monster Objection should be a concern only for those philosophers who believe in the existence of past entities. To illustrate, a presentist, who does not believe in the existence of the past, would deny that Cleopatra exists. But if Cleopatra does not exist, neither does the monster, and the Monster Objection does not get off the ground.[32] We call this the Presentist Reply to the Monster Objection.

### 4.4 The Restricted Composition Reply

The second requirement for the Monster to exist is that there is a sum of the ham and Cleopatra. Even provided that both the ham and Cleopatra exist, it is definitely controversial that two entities that are apparently so divided in spacetime and unrelated to each other form a sum. Upholders of unrestricted composition will accept this, but all those who reject unrestricted composition with the aim of avoiding commitment to such sums would likely deny that there is a sum of the ham and Cleopatra. And if there isn't such a sum, the Monster Objection does not get off the ground. We call this the Restricted Composition Reply to the Monster Objection.

One might protest here. The aim of the Monster Objection is to challenge standard mereology, which is usually committed to unrestricted composition. We are here proposing as a way out the rejection of unrestricted composition. But if unrestricted composition is rejected, so is standard mereology and the Monster Objection has already achieved its goal. Our point is that this is not the case. Some popular mereological systems, such as CEM, are indeed committed to unrestricted composition. However, we argued that the target of the Monster Objection is not CEM. Rather, it is "standard mereology", which is far weaker than CEM, and of which CEM is nothing but an instance. The Monster Objection also provides an indirect motivation for accepting hylomorphism. And one could reject unrestricted composition without

[32] Note that a spatial variant of the Monster Objection in which a gerrymandered sum of the ham and the Eiffel Tower, say, would not go through, for the temporal restriction of that monster to the time of the sandwich would not be identical to the ham.

committing oneself to hylomorphism – examples abound (McKenzie and Müller 2017; Petersen 2019; Simons 1987, Waechter and Ladyman 2019).

Here we have introduced two ways of denying the existence of the monster. It is worth noticing that the two ways are independent from one another. If one rejects unrestricted composition, one could retain the existence of past entities. For example, one obvious way would be to require that a necessary---even if not sufficient---condition for composition is synchronicity: there are no diachronic fusions. And if one rejects the existence of past entities, one can arguably retain unrestricted composition, and even CEM, in its full strength.

## 5. Conclusions

We have presented several replies to the Monster Objection. Each of them has its own individual strength. Are we perhaps in danger of losing sight of the forest for the trees? In order to reduce this risk, let us focus on the broader picture these replies suggest. We (i) present this picture, (ii) relate it to the different conceptions of standard mereology which we identified in § 2, and (iii) discuss a final worry concerning commonsense.

If all our strategies are considered together, one immediately sees that for any major metaphysical stance, there is a natural way out of the Monster Objection. Presentists are naturally led to adopt the Presentist Reply to the Monster Objection (§ 4.3). Arguably, non-presentists who are three-dimensionalists will be naturally inclined to adopt the Temporary Mereology Reply (§ 4.2), while non-presentists who are four-dimensionalists will be inclined to adopt the Four-dimensionalist Reply (§ 4.1). Since we have taken into account both presentists and non-presentists, this seems to give a fairly exhaustive picture of the metaphysical landscape.

Let us now turn to the second point of this conclusion. The Monster Objection is supposed to be an objection to standard mereology. In § 2, we suggested that standard mereology is a family of views according to which material objects are completely unconceptual and relatively unstructured. However, we have also pointed out that not everyone agrees that this is the target of the Monster Objection. According to Kathrin Koslicki (2008), the target of the Monster Objection is one particular member of that family, namely CEM. According to Sattig (2015), the target of the Monster Objection is the standard Lewisian four-dimensional view of objects, namely a view that combines mereological elements – such as CEM, tenseless mereology and the claim that composite objects are mere sums of their parts – with metaphysical ones – such as perdurantism.

If the first interpretation is adopted, then all the replies that we have presented apply to the Monster Objection. On the other hand, if Koslicki's interpretation is adopted, all replies apply, except one, namely the Restricted Composition Reply. Clearly enough, that's because Restricted Composition is at odds with CEM. Finally, if Sattig's interpretation is adopted, the Temporary Mereology Reply has to be discarded as well. That is because the Lewisian view adopts a primitively tenseless mereology.

Before concluding let us address one final worry. One might want to develop the claim that the Monster Objection is an argument to the effect that standard mereology does not allow us to preserve our commonsensical worldview, for it does not allow us to retain platitudes such as: a sandwich does not exist before its creation, or, the Monster is not part of the sandwich. Given this, one might take our replies to be illegitimate. We propose to save standard mereology at the cost of adopting counter-intuitive views such as four-dimensionalism. So, the objection goes, we have failed to defeat the Monster.

While we agree that *some* of our replies might be taken by some to display a certain degree of counter-intuitiveness (i.e. the four-dimensionalist one), we also offered other ways out that build on views that are often described in the literature as being very close to common sense. Here are two examples. Presentism, for better or worse, is usually presented as the metaphysics of time that is closer than its rivals to commonsense. And Restricted Composition is often said to be the commonsensical view in the metaphysics of composition.

In the light of the above, it seems safe to conclude that we should not be afraid of the Monster. But it should not be forgotten either. In fact, it should be addressed thoroughly. And this is what the paper has attempted to do. Facing up to monsters is how we often come to grasp truths of the first water. Not every monstrous creature is a threat. Sometimes, a monster is a thing of beauty.[33]

*Università della Svizzera italiana and University of Geneva, Switzerland*

## References

Austin, C. (2018) 'A Biologically Informed Hylomorphism', in: W. Simpson, R. Koons, N. Teh (eds.) *Neo-Aristotelian Perspectives on Modern Science*, 185-210. London-New York: Routledge.

Bittner, T., Donnelly, M., Smith, B. (2004) 'Individuals, universals, collections: On the foundational relations of ontology', in A. Varzi, L. Vieu (eds.) *Formal Ontology in Information Systems. Proceedings of the Third International Conference*, 37-48. IOS Press.

Brower, J. (2010) 'Aristotelian Endurantism: A New Solution to the Problem of Temporary Intrinsics', *Mind* 119/476: 883-905.

Brower, J. (2014), *Aquinas' Ontology of the Material World: Change, Hylomorphism, and Material Objects*. New York: OUP.

[33] For helpful comments and discussion, we are grateful to Alessandro Giordani, Kit Fine, Kathrin Koslicki, Marco Marabello, Kevin Mulligan, Thomas Sattig, Peter Simons, two anonymous referees and audicences in Bochum, Geneva, Utrecht. This work was supported by the Swiss National Science Foundation, project number PCEFP1181088, and 185435.

Fine, K. (1982) 'Acts, Events, and Things', in W. Leinfellner (ed.), *Language and Ontology, proceedings of the VI Wittgenstein Symposium,* 97-105. Vienna: Hölder-Pichler-Tempsky.

Fine, K. (1994) 'Compounds and aggregates', *Noûs*, 28/2: 137-158.

Fine, K. (1999) 'Things and Their Parts', *Midwest Studies in Philosophy*, 23/1: 61-74.

Fine, K. (2003) 'The Non-Identity of a Material Thing and Its Matter', *Mind*, 112/446: 195-234.

Fine, K. (2006) 'In Defense of Three-dimensionalism', *The Journal of Philosophy ,* 103/12: 699-714.

Fine, K. (2008) 'Coincidence and Form', *Aristotelian Society Supplementary*, 82: 101-118.

Fine, K. (2010) 'Towards a Theory of Part', *Journal of Philosophy*, 107/11: 559-589.

Fine, K. (2017) 'Form', *The Journal of Philosophy*, 114/10: 509-535

Fine, K., (2020) 'The Identity of Social Groups' *Metaphysics*, 3/1; 81–91.

Giaretta, P., Spolaore, G. (2011) 'A Mereology for the Change of Parts', in N. Miščević, B. Žarnić (eds.), *Between Logic and Reality*, 243-259. Reidel, Springer.

Gilmore, C. (2006), 'Where in the Relativistic World Are We?' *Philosophical Perspectives,* 20: 199-236.

Jacinto, B., Cotnoir, A. (2019) 'Models for Hylomorphism', *Journal of Philosophical Logic*, 48: 909-955.

Jaworski, W. (2016) *Structure and the Metaphysics of Mind: How Hylomorphism Solves the Mind-body Problem.* Oxford, OUP.

Johnston, M. (2006) 'Hylomorphism', *The Journal of Philosophy*, 103/12: 652-698

Jubien, M. (2001) 'Thinking About Things', *Philosophical Perspectives* 15: 1-15.

Koons, R. (2014) 'Staunch vs. Faint-hearted Hylomorphism: Toward an Aristotelian Account of Composition', *Res Philosophica*, 91/2: 151-177.

Koons, R. (2018) 'Hylomorphic Escalation: An Aristotelian Interpretation of Quantum Thermodynamics and Chemistry', *American Catholic Philosophical Quarterly*, 92/1: 159-178

Korman, D. (2015).*Objects*. Oxford. Oxford University Press.

Koslicki, K. (2008) *The Structure of Objects*. Oxford: Oxford University Press.

Koslicki, K. (2018) *Form, Matter, Substance*. Oxford: Oxford University Press.

Kosliki, K. (2018b) 'Towards a Hylomorphic Solution to the Grounding Problem', *Royal Institute of Philosophy Supplements*, 82: 333-364

Heil, J. (*forthcoming*) 'Hylomorphism: what's not to like?', *Synthese*.

Hovda, P. (2009) 'What Is Classical Mereology?', *Journal of Philosophical Logic,* 38/1: 55 - 82.

Hovda, P. (2013) 'Tensed Mereology', *Journal of Philosophical Logic* 42/2: 241-283.

Inman, R. (2014) 'Neo-Aristotelian Plenitude, *Philosophical Studies* 168/3: 583-597.

Lewis, D. K. (1991) *Parts of Classes*. Oxford: Blackwell.

Lewis, D. K. (1986) *On the Plurality of Worlds*. Oxford: Wiley-Blackwell.

Lowe, E. J. (2006) *The Four-Category Ontology: A Metaphysical Foundation for Natural Science.* Oxford, OUP.

Markosian, N. (1998) 'Brutal Composition', *Philosophical Studies*, 92/3: 211 - 249.

Markosian, N (2014) 'A Spatial Approach to Mereology', in S. Keinschmidt (ed.), *Mereology and Location*, 69-90. Oxford: Oxford University Press.

Marmodoro, A. (2013) 'Aristotle's Hylomorphism Without Reconditioning', *Philosophical Inquiry*, 36/1–2, 5–22.

Marmodoro, A., Paolini Paoletti, M. (2021), 'Introduction to the Special Issue on Form, Structure and Hylomorphism', *Synthese*, 198/11: 2647-2656.

McKenzie K., Müller F. (2017) 'Bound States and the Special Composition Question' in M. Massimi, J. Romeijn, G. Schurz (eds), *EPSA15 Selected Papers. European Studies in Philosophy of Science,* 233-41. Berlin: Springer.

Merricks, T. (1995), 'On the incompatibility of enduring and perduring entities', *Mind*, 104/415: 521-531.

Merricks, T. (1999) 'Persistence, parts, and presentism' *Noûs*, 33/3: 421-438.

Morganti, M (2021) 'Quantum entanglement: a hylomorphic account', *Synthese,* 198/11: 1-21.

Paul, L. (2002),'Logical Parts', *Nous*, 36/4: 578-596.

Petersen, S. (2019) 'Composition as Pattern', *Philosophical Studies,* 176/5: 1119-1139.

Pruss, A. (2013) 'Aristotelian Forms and Laws of Nature', *Analysis and Existence*, 24: 115-132.

Rea, M. (1998) 'Sameness without Identity: An Aristotelian Solution to the Problem of Material Constitution', *Ratio*, 11: 316-328.

Rea, M. (2011) 'Hylomorphism Reconditioned', *Philosophical Perspectives*, 25/1: 341–58

Sattig, T. (2015), *The Double Lives of Objects. An Essay in the Metaphysics of the Ordinary World.* Oxford: Oxford University Press.

Sattig, T. (2019), 'Part, slot, ground: foundations for a neo-Aristotelic mereology', *Synthese*, 198/11: 1-15.

Sider, T. (1997) 'Four-dimensionalism', *Philosophical Review*, 106/2: 197-231.

Sider, T. (2001) *Four Dimensionalism: An Ontology of Persistence and Time*. Oxford: Oxford University Press.

Simons, P. (1987) *Parts: A Study in Ontology*. Oxford: Oxford University Press.

Thomson, J. (1983) 'Parthood and Identity Across Time', *Journal of Philosophy*, 80: 201–20.

van Inwagen, P. (1990) *Material Beings*. Ithaca: Cornell University Press.

Varzi, A. (2001) 'Parts, Counterparts, and Modal Occurrents', *Travaux de Logique* 14: 151–171.

Varzi, A. (2003) 'Naming the stages', *dialectica*, 57/4: 387–412.

Varzi, A. (2005) 'Change, Temporal Parts, and the Argument from Vagueness', *dialectica*, 59: 485-498

Varzi, A., Cotnoir, A. (2021)*, Mereology*. Oxford, Oxford University Press.

Waechter, J., Ladyman, J. (2019) 'In Defence of Ordinary Objects and a Naturalistic Answer to the Special Composition Question', in J. Cumpa, B. Brewer, *The Nature of Ordinary Objects*, 82-128. Cambridge: Cambridge University Press.