CONCEPTUALIZING KANT'S MEREOLGY

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In the Resolution of the Second Antinomy of the first *Critique* and the Dynamics chapter of the *Metaphysical Foundations of Natural Sciences*, Kant presents his critical views on mereology, the study of parts and wholes. He endorses an unusual position: Matter is said to be infinitely *divisible* without being infinitely *divided*. It would be mistaken to think that matter *consists* of infinitely many parts—rather, parts “exist only in the representation of them, hence in the dividing”. This view, according to which parts are *created* through division somehow, was criticized as obscure early on, and has not received much attention since. Against this trend, I show how a coherent position, which I call *Mereological Conceptualism*, can be extracted from the sparse textual basis.

There was a time when the dispute respecting monads employed such general attention, and was conducted with so much warmth, that it forced its way into company of every description, that of the guard-room not excepted. There was scarcely a lady at court who did not take a decided part in favour of monads or against them. In a word, all conversation was engrossed by monads – no other subject could find admission.

[...]

As this controversy has made a great deal of noise, you will not be displeased, undoubtedly, if I dwell a little upon it. (Euler 1835: 39–40)

1. Introduction

Is matter infinitely divisible, or does it consist of simple, indivisible parts? This question of mereology—the study of parts and wholes—was widely discussed in early modern philosophy. Kant made several contributions to this debate, culminating in the Second Antinomy of the Critique of Pure Reason. Here Kant

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makes the puzzling claim that *neither* does matter consist of simple parts, *nor* is it infinitely divisible—at least if infinite divisibility is understood to entail that matter *consists* of infinitely many parts. Rather, as he sums up his view in the *Metaphysical Foundations of Natural Science*, we should say “that there are just so many parts in the appearance as we may provide, that is, so far as we may divide” (MAN 4:506–507).¹

The “*infinite divisibility* of matter, whereby it still does *not* consist of *infinitely many parts*” (MAN 4:506) is hard to understand, since Kant’s remarks on central elements of his theory—the distinction between *possible* and *actual* parts, and what is meant by *division*—are extremely sparse. As I will show, we can nevertheless extract a coherent position by using other parts of the Kantian framework. I claim that Kant holds a view that can be described as *Mereological Conceptualism* (MC), according to which:

(MC₁) Mereological facts such as ‘*x* is part of *y*’ obtain in virtue of *x* being represented as a part of *y* using some concept *C*.

(MC₂) While mereological facts are concept-dependent, the *existence* of the objects that can stand in mereological relations is not—so the obtaining of mereological facts doesn’t bring new objects into existence.

Investigating Kant’s views on mereology is useful for both exegetical and systematic reasons. On the exegetical side it is striking that while the Second Antinomy has been widely discussed, nearly all commentators focus exclusively on Kant’s arguments for Thesis and Antithesis, while the *resolution* of the Antinomy tends

1. For Kant’s writings, I use the following abbreviations:

Anthro Anthropology from a Pragmatic Point of View

Kästner On Kästner’s Treatises

CJ Critique of the Power of Judgment

CPR Critique of Pure Reason

Logic Logic. A manual for lectures (Edited by Gottlob Benjamin Jäsche)

MFNS Metaphysical Foundations of Natural Science

PM Physical Monadology

Prol Prolegomena to Any Future Metaphysics That Will Be Able to Come Forward as Science

M-Pöl Metaphysics L2 (Pölitiz)

M-Volck Metaphysics Volckmann

“Volume:Page” refers to the Akademie-Ausgabe, “A/B” to the first and second edition of the *CPR*. The Cambridge translations (Kant 1997, Kant 1998, Kant 2002, Kant 2006) are used except for *Kästner* (Kant 2014).

to be neglected.² This is unfortunate, since it is in the resolution where Kant—if only sketchily—presents his *positive* account of mereology. And we should expect to gain a better understanding of Kant’s negative arguments against Thesis and Antithesis from engaging with his positive proposal.

Systematically, Kant’s proposal seems notably different from most of the positions discussed among contemporary mereologists. It shares some features with views according to which mereological facts are metaphysically indeterminate, but it is unusual to motivate this in the conceptualist way Kant does.³ While I will not be able to investigate whether Mereological Conceptualism is an attractive position if one detaches it from the Kantian framework, I hope that my exposition makes clear that this could be an interesting project in its own right. Furthermore, I will draw on contemporary metaphysics to make sense of Kant’s position in the first place, so systematic issues and history of philosophy go hand in hand here.

In the next section, I start with some methodological remarks and briefly introduce the Second Antinomy. The focus will be to see how Kant intends to *solve* the Antinomy. According to him, both theses rely on the false presupposition that which and how many parts a composite object has is *determinate*. Section 3 then deals with how, according to Kant, a corrected construal of mereology should look like. We will see that Kant’s remarks on this topic are very brief, and thus require elaboration. Section 4 develops my proposal: Mereological Conceptualism, as characterized above, and in Section 5 I show that it can elegantly explain much of what Kant says about mereological matters. I conclude by pointing out some aspect of Kant’s views on mereology that demand further exploration.

2. The Second Antinomy

2.1. Methodological Preamble

To begin with, some remarks about my general approach to Kant’s mereology will be useful. First, there is the question of textual coverage. Kant discusses the divisibility of matter in different stages of his philosophical development: His early *Physical Monadology*, for instance, defends a certain kind of atomism, which he later comes to reject.⁴ I am however interested in understanding the *critical*

2. Notable exceptions are Bennett (1974: 177–183), whose assessment of the resolution is quite negative, Malzkorn (1999: 270–277) and Engelhard (2005: Ch. III.3). More references can be found in Engelhard (2005: 337 fn. 76).

3. Kriegel (2012) and Pearce (2017) are exceptions. See Varzi (2016: §5) for a general overview where the focus is on vagueness. One much-discussed question is whether mereological indeterminacy entails indeterminate existence, which we will encounter later when discussing (MC₂).

4. See Holden (2004: Ch. 6) for an illuminating account of Kant’s early position in the *PM*, and Friedman (2013: § 13) for a reconstruction of Kant’s later argument against his earlier

Kant's views on mereology, so the primary focus will be on the Critique of Pure Reason, the Prolegomena, and the Metaphysical Foundations.⁵ From time to time, it will also be necessary to consult unpublished texts.

Secondly, and more importantly, Kant's Transcendental Idealism (TI) obviously plays a big role in the first Critique, and Kant specifically stresses that his solution to the Second Antinomy relies on TI (*CPR* A506/B534). Notoriously, however, there is plenty of disagreement as to what TI really amounts to—with readings ranging from merely epistemological to metaphysical.⁶ As far as possible, I want to stay neutral about the status of TI, in order to focus on the less explored area of mereology. However, one minimal assumption is needed for my project. If one is a metaphysical *realist*, the following two questions need to be sharply separated:

- (1) What is the mereological structure of things and matter?
- (2) What mereological structure do we *represent* the world as having?

In other words, on a realist view there is always the possibility that we represent the world in a certain way—for instance as having certain mereological properties—while in fact the world happens to be quite unlike how we represent it. And that means we cannot deduce facts about the world from facts about our *perception* of the world.

Against this realist view, I will assume that Kant's TI entails that we *can* make this inference: The way our perception is gives us a guide to the constitution of reality. Hence, I will often draw on passages where Kant talks about how we perceive things in order to draw conclusions about the mereological structure of objects in the world. This should not be *too* controversial. TI is a kind of *idealism* after all, so we should not expect the same degree of mind-independence a metaphysical realist would advocate.

Having settled these preliminaries, we are now ready to look at the Second Antinomy, where we work ourselves towards its resolution by briefly looking at Thesis and Antithesis.⁷

2.2. Thesis and Antithesis

These are Thesis and Antithesis of the Second Antinomy:

THESIS

Every composite substance in the world consists of simple parts, and

atomism.

5. I also assume that Kant's views on mereology did not change during the critical period. For some remarks on differences between the sources see Footnote 13.

6. For an overview see Schulting (2010) and Stang (2016).

7. For the most part I follow the reconstruction in Malzkorn (1998) and Malzkorn (1999: § 2.3). Other important interpretations are Bennett (1974: Ch. 9), Falkenburg (1995) and (2000: § 5.6.2), van Cleve (1999: Ch. 6), Grier (2001: Ch. 6) and Engelhard (2005: Ch. 2).

nothing exists anywhere except the simple or what is composed of simples.
(CPR A434/B462)

ANTITHESIS

No composite thing in the world consists of simple parts, and nowhere in it does there exist anything simple. (CPR A435/B463)

Much could be said about these theses, and even more about the arguments Kant presents to support them. In order to get to the Resolution quickly, we have to limit the discussion to the essentials. I take the following to capture the logical form of the Thesis:

(T) For all x : If x is a composite substance, then x consists of simple parts.⁸

In the case of the Antithesis there is a complication, since the second half of Kant's formulation is arguably stronger than its first half: Whereas the first half allows that there might be simples which are not part of composites, the second half excludes this possibility. In this paper I will only consider the first claim, which can be captured as follows:⁹

(AT) For all x : If x is a composite substance, then it is not the case that x consists of simple parts.

One might worry that the Thesis concerns *substances*, while the Antithesis talks about *things*, and so appears to be more general in scope. Against this, I think Kant's subsequent remarks show that this terminological difference is inessential, and both theses are concerned with substances (CPR A435/B463; Malzkorn 1999: 169–171).

Let us now consider Kant's diagnosis that (T) and (AT) are both *false*. There is one obvious way in which this could be so: If there are *some* substances that consist of simple parts, and others that don't. This, however, cannot be the case Kant takes to be actual, since he thinks that there is a good argument against the existence of simples in general. But what else does he have in mind when claiming that both theses are false? Here the following passage about the *First Antinomy*, which concerns the size of the world, is helpful:

8. To say that x consists of simple parts is ambiguous: It can mean that x has *some* simple part(s), or that *all* parts of x are simple. Kant's argument seems to require the first, weaker, reading (Malzkorn 1999: 172), although see Watt (in press) for an endorsement of the strong interpretation.

9. The stronger claim that there are no simples at all leads to a number of exegetical problems, see Schmiedege (2006) and Watt (in press).

But if it is said that the world is either infinite or finite (not-infinite), then both propositions could be false. For then I regard the world as determined in itself regarding its magnitude, since in the opposition I not only rule out its infinitude, and with it, the whole separate existence of the world, but I also add a determination of the world, as a thing active in itself, which might likewise be false, if, namely, the world were *not* given *at all as a thing in itself*, and hence, as regards its magnitude, neither as infinite nor as finite. (CPR A504/B532)

The general idea seems to be this: Someone might claim that the world is either infinite or finite, and *prima facie* one of the disjuncts has to be true. According to Kant, there is a third, less obvious possibility though: The world might fail to have a determinate size at all. Since the having of a determinate size is a presupposition of ascribing to it either a finite *or* an infinite size, the falsity of this presupposition in turn falsifies *both* size-ascriptions.¹⁰

How does this apply to the mereological case? The obvious equivalent to the assumption that the world has a determinate size would be the following:

(Det) For composite substances, it is determinate which and how many parts they have.

And if this is a *false* presupposition, then presumably its negation holds:

(¬Det) For composite substances, which and how many parts they have is *indeterminate*.

Interpreting Kant as assuming (¬Det) makes sense of his diagnosis of the Second Antinomy: Since both Thesis and Antithesis are supposed to be claims about what parts composite objects have, it is reasonable to hold that they are both false if there is no determinate fact of the matter. In the next section, I will take a closer look at the the relevant kind of indeterminacy.

2.3. Composite Substances

I suggested that Kant takes (T) and (AT) to be both false because they require the truth of (Det). His alternative proposal—the indeterminacy postulated by (¬Det)—needs to be elucidated further though, for it is not immediately clear what it means to say that which parts a composite object has is indeterminate. Let us start by looking at an important passage:

For [...] appearances are mere representations, and the parts exist only in the representation of them, hence in the dividing, i.e., in a possible experience in which they are given, and the dividing therefore proceeds only as

10. Compare the discussion of contradictory opposites in CPR A503/B531.

far as possible experience reaches. To assume that an appearance, e.g., of a body, contains within itself, before all experience, all of the parts to which possible experience can ever attain, means: to give to a mere appearance, which can exist only in experience, at the same time an existence of its own previous to experience, which is to say: that mere representations are present before they are encountered in the representational power, which contradicts itself[.] (*Prol* 4:342)

Kant here makes the following claims concerning appearances:

- (1) The parts of an appearance exist only “in the dividing”.
- (2) From the perspective of TI, it would be a mistake to hold that an appearance contains all its parts “in itself”, since the existence of parts depends on them being *represented*.

Accordingly, Kant thinks that it is wrong to assume that, if we encounter some composite whole, thereby all of its parts exist as well. Instead, some kind of *division* is required to bring parts into existence, a process which somehow involves representations of the parts. Kant also makes this point on other occasions:

For what is only actual by being given in the representation also has no *more* given of it than what is met with in the representation – no more, that is, than the progress of representations reaches. Therefore, one can only say of appearances, whose division proceeds to infinity, that there are just so many parts in the appearance as we may provide, that is, so far as we may divide. For the parts, as belonging to the existence of an appearance, exist only in thought, namely, in the division itself. (*MAN* 4:506–507)

Here again he expresses the thought that we have to *do* something to bring parts into being—their existence cannot be taken for granted.

One might worry, however, that the position Kant recommends here is incoherent. After all, it seems that a composite whole must *by definition* consist of parts, and so the existence of a whole entails the existence of parts. How can it then be that an additional process of division is needed to bring parts into existence?

To understand what Kant has in mind, it is crucial to adopt his distinction between *possible* and *actual* parts. The most revealing passage is the following:

Thus of the division of matter (of a body) that is given within certain boundaries, it must be said that it goes to infinity. For this matter is given in empirical intuition as a whole, and consequently with all its possible parts. (*CPR* A513/B541)

From this the following picture emerges: Matter consists of possible parts, not all of which are actual in itself, they rather have to be made actual through a process of division. Consequently, there is room for a notion of substance which is composite in the sense of having possible parts, but fails to have any actual parts—and that dispels the fear of incoherence we just encountered. The view Kant *rejects* can then be spelled out more clearly:

If a composite substance *s* exists, then all the *possible* parts of *s* are *actual*.

A large part of this paper is consequently dedicated to fleshing out the actual/possible part-distinction. Before we come to that, let us briefly consider how it helps to explain what I identified as the false presupposition underlying the Second Antinomy:

(Det) For composite substances, it is determinate which and how many parts they have.

I take it that for transcendental realists, facts about how many parts an object has are settled once and for all. For example, if an object is an atom—that is, has no proper parts—then it is *necessarily* an atom. And this is very different from Kant's view, at least if we identify parts with *actual* parts. There can be an object that is atomic in the sense of having no actual parts, which then ceases to be an atom in virtue of further parts being actualized—however exactly that is achieved. And this is not the kind of atomism defenders of the Thesis hold, since they presumably believe in atoms that are indivisible in an absolute sense.¹¹

Transcendental realists thus maintain that mereological facts are determinate in the sense that they obtain independently of any process of division, whereas Kant denies this (compare Malzkorn 1998: 404). As we will see in more detail later, for Kant division amounts to representing objects in a certain way, and so facts about actual parts turn out to be indeterminate in the sense of being dependent on concepts and representations. Of course, there are further questions to be asked here. In particular, one might wonder whether it is determinate which *possible* parts an object has, and whether that is a problem for my interpretation. I will come back to this later (in §4.5), when we have a better understanding of the details of Kant's position.

11. According to Kant, there could be no absolutely indivisible objects in space, since space itself is infinitely divisible (CPR A439–441/B467–469, MAN 4:504–508).

3. Kant's (Puzzling) Resolution

3.1. Actual(izing) Parts

After briefly reviewing what Kant takes to be the problem with Thesis and Antithesis of the Second Antinomy, we have now arrived at the Resolution. In this section, I will state and discuss two important questions Kant's positive view gives rise to.

Once we accept a distinction between possible and actual parts, the most obvious question is the following:

(Q₁) How does a possible part become actual?

One might think that the answer is simple: through *division*. That is certainly correct but only takes us so far, since what does Kant *mean* by division? We are familiar with cases where division amounts to separating parts from an object they were previously attached to, like that of cutting a cake. But we already saw in the quotes above that Kant connects division with the *representation* of parts, which suggests that he takes the relevant kind of division to be a mental process. So it is not clear that carving up a cake is a good analogy here.¹²

Although (Q₁) is fundamental to understanding his view, Kant's remarks on division are very sparse and not too illuminating. The most explicit statement is the following:

Hence I will have to say: the multiplicity of parts in a given appearance is in itself neither finite nor infinite, because appearance is nothing existing in itself, and the parts are given for the very first time through the regress of the decomposing synthesis, and in this regress, which is never given absolutely *wholly* either as finite nor as infinite. (CPR A505/B533)

Here Kant mentions a *decomposing synthesis*, which seems to lead to the actualization of parts. Unfortunately, Kant never explicitly talks about this particular kind of synthesis again, and his *general* characterisation of synthesis makes one wonder—after all, synthesis is introduced as a mental process of *combining* things. This tension makes Vaihinger exclaim:

Decomposition is the exact opposite of synthesis! (Vaihinger 1892: 225 fn. 1, my translation)

12. Further evidence that for Kant division is not the same as physical separation is provided by remarks in the Transcendental Aesthetics according to which the parts of space "are only thought in it" (CPR A25/B30), and the parts of time can be "determinately represented only through limitation" (CPR A32/B48). In both cases there is arguably a sense in which something is divided, and this kind of division appears to be achieved through representations.

And Kemp Smith thinks that the concept is contradictory as well:

The clash of conflicting tenets which Kant is striving to reconcile could hardly find more fitting expression than in this assertion of an *analytic synthesis*. (Kemp Smith 1918: 95)

So while on the surface Kant has an answer to (Q₁), it urgently requires clarification. We have not yet understood what a decomposing synthesis could be.¹³

3.2. Possible Parts

Before we come back to answering (Q₁), we will also need to gain a better understanding of what Kant actually means by *possible parts*. Here is one of the most interesting passages:

[I]t is by no means permitted to say of such a whole, which is divisible to infinity, that *it consists of infinitely many parts*. For though all the parts are contained in the intuition of the whole, the *whole division* is *not* contained in it; this division consists only in the progressive decomposition, or in the regress itself, which first makes the series actual. (CPR A524/B552)

Confusingly, Kant says here that while it is mistaken to say that a whole consists of infinitely many parts, in *some* sense all the parts that can be obtained through division *are* contained in a whole. Prima facie this is strange—how could the parts be contained in a whole without composing it? According to some, Kant is just wrong or confused about the existence of parts prior to any division (Bennett 1974: 178). But I think we can be more charitable. Remember the passage in which the notion of possible parts is introduced:

Thus of the division of matter (of a body) that is given within certain boundaries, it must be said that it goes to infinity. For this matter is given in empirical intuition as a whole, and consequently with all its possible parts. (CPR A513/B541)

This suggests that Kant holds the following: Given some intuition of a whole, all its *possible* parts are given to us. Only some of these parts are actualized, however,

13. The only interpretation in the literature that I am aware of is due to Malzkorn, who takes the relevant notion of division to be physical separation, as in the above example of dividing a cake (Malzkorn 1998: 406; 1999: 275–277). This is unconvincing though, since we can hardly say that this physical separation is brought about by an act of *synthesis*—the latter is a mental act after all. Note that this does not mean that Kant *denies* that objects are infinitely divisible when division is understood as physical separation: In fact, this is something he explicitly argues for in the *MFNS* (MFNS 4:502–503). In this respect the latter work seems to go beyond the Resolution of the Second Antinomy, since one could read the arguments of the *CPR* as applying to metaphysical divisibility only (Holden 2004: 12–14).

and the process of dividing can be continued to infinity, making more and more parts actual. Apparently, possible parts thus somehow exist *prior* to any division.

This is a step in the right direction, but now one would like to know why it is unproblematic to assume the prior existence of possible, but not of actual, parts. In order to properly understand Kant's mereology, the following question thus demands answering:

- (Q₂) What are possible parts, and in what sense can they exist prior to division?

Now that we have formulated (Q₁) and (Q₂), the constructive part of this paper can begin. In the next section, I will present my positive interpretation of Kant's mereology, and argue that it can successfully answer these questions.

4. Mereological Conceptualism

4.1. Agenda

In this section, I introduce Mereological Conceptualism, and argue that Kant holds this view. We will have to look at different parts of Kant's system to arrive at this result, so in order not to lose track, I will start by explaining what Mereological Conceptualism amounts to. The position consists of two theses:

- (MC₁) Mereological facts such as '*x* is part of *y*' obtain in virtue of *x* being represented as a part of *y* using some concept *C*.
- (MC₂) While mereological facts are concept-dependent, the *existence* of the objects that can stand in mereological relations is not—so the obtaining of mereological facts doesn't bring new objects into existence.

I take it that the idea behind (MC₁) is relatively straightforward to understand: The claim is that mereological facts are made true by, or are grounded in, facts which involve subjects representing objects in a certain way using concepts. It is of course less clear why anyone should *endorse* (MC₁), and in order to answer that we will have to look closer at Kant's critical conception of cognition.

(MC₂), on the other hand, requires some elucidation before we can even wonder whether it is plausible or not. What do I mean by the claim that the *existence* of the objects standing in mereological relations is not concept-dependent? In order to understand this, consider the talk of *possible parts* we encountered earlier. When someone says '*x* is a possible part of *y*', this has two readings:

- (de re) There are *x* and *y*, such that: It is possible that *x* is part of *y* (and *x* is not actually part of *y*).

(de dicto) There is *y*, and it is possible that: There is an *x* which is part of *y* (and no actual object is identical to *x*).

On the de re reading, to say that *x* is a possible part of *y* doesn't entail that *x* doesn't exist—it merely means that *x* doesn't actually stand in the parthood-relation to *y* (but could possibly do so). The de dicto reading, in contrast, is more radical: According to it the possible part *x* doesn't even actually exist, but merely *could* exist.

Corresponding to these two readings, Kant's claim that possible parts need to be actualized can then be read in two ways: Either it merely means that certain mereological relations have to be actualized, or it means that new objects—the parts—need to be created to stand in such relations in the first place. (MC₂), then, opts for the first, de re reading of Kant's claim. For reasons why this is the more plausible interpretation, we again need to go into the details.

The structure of this section is as follows: First, I will look at Kant's theory of space and the role of synthesis, which I argue supports (MC₂). This, in turn, enables us to answer (Q₂): In what sense do possible parts exist prior to division? Then we will consider Kant's views about quantities and the role of measures, which I argue support (MC₁). This then puts us in a position to answer (Q₁): How are possible parts actualized?

4.2. Space and Synthesis

According to Kant's transcendental idealism, space and time don't exist 'in themselves', but are mind-dependent. The things we experience are represented as being in space and time, because space and time are *forms of intuition*—that is, our faculty of intuition is constituted in such a way that all experienceable objects are set in one spatiotemporal framework (CPR A26–28/B42–44).

Imagine I perceive a red ball. According to Kant, what happens in such a case is roughly this: Through my faculty of sensibility, I am affected by something (CPR A19/B33). This affection brings about certain *sensations*, which make it the case that I perceive the ball as being *red*, not green or yellow. These sensations are then put into the spatiotemporal framework:

[...] sensation is no intuition *containing* space or time, although it does place the object corresponding to it in both [...] (Prol 4:306)

So much for the job of sensibility. Now the active faculty of *understanding* comes in, which has at least two jobs: to judge, and, more importantly for us, to execute the process Kant calls 'synthesis'.

What synthesis is has been hotly debated in recent years. One especially controversial question is the following: Is a synthesis of the understanding needed to *create* intuitions (singular representations which relate to objects), or does it

merely *transform* them?¹⁴ I want to stay as neutral as possible here. It seems quite uncontroversial that Kant distinguishes between different stages of processing:¹⁵

STAGE 1: Sensibility is affected by things, which leads to the representation of objects in space and time, as described above.¹⁶

STAGE 2: The synthesis of the understanding transforms the representations from Stage 1. This involves concepts in some way, either because it is a form of judgement or a non-judgemental application of concepts. One effect of this synthesis is that we become *conscious* of the relevant representations.

STAGE 3: The understanding uses the representation from Stage 2 to form *judgements*.

The recent debate about (non-)conceptualism then partly concerns the question at which stage *intuitions* are located: Non-conceptualists will say that the representations of Stage 1 are already intuitions (Allais 2009), while conceptualists want to reserve this title for the representations of Stage 2 (Grüne 2009). In order to stay neutral, let us use the following convention: Call Stage 1-representations intuition₁, Stage 2-representations intuition₂, and let's stay silent about which are the 'real' intuitions (Schafer 2017: 1676).

For our purposes, the most important question is the following: What does the synthesis of the understanding actually *do*? I will follow the prominent interpretation that its role is to make representations *conscious* (Tolley 2013: 123–124). The idea here is the following: While intuitions₁ do represent objects in some way, this doesn't entail that we are conscious of those objects represented merely by *having* an intuition₁. Consciousness rather needs to be brought about by the synthesis of the understanding, which "goes through" an intuition₁ and the representations contained in it, and makes (some of) them consciously accessible (CPR A97, A99).

One might reasonably ask *why* this kind of synthesis is necessary. Kant's idea seems to be that sensibility and understanding employ different modes of representing: Whereas in intuitions₁, several representations are given 'in one

14. For an overview of the debate about (non-)conceptualism see McLearn (2014) and Allais (2016).

15. Whether these stages are merely *logically* distinct, or are executed successively in time can be left open here. My set-up is not *completely* neutral, however, since Conant (2016) has recently argued that one should interpret Kant as holding that the process of cognition is unitary in a very strong sense, which leaves no room for distinguishing different 'layers' or stages. Unfortunately I will not be able to discuss the ramifications of such a reading on my own account here.

16. Whether the affection is caused by things in themselves, empirical objects, or both is in turn controversial, see Stang (2015).

moment', the understanding works *successively*, and so has to work through the material given by sensibility one by one (CJ 5:407–408). (A worldly analogy might be the transition from an analog way of representing data to a digital kind of storage.)

How exactly the synthesis executes this job will be discussed later. For now, let us look at the structure of the process:

The small rectangles within the box representing intuition₂ are supposed to signify that certain sub-representations of the intuition₁ have been made conscious by the synthesis. Next, I will argue that this kind of process gives us the resources to answer (Q₂).

4.3. Answering (Q₂): Possible Parts

Our question was:

(Q₂) What are possible parts, and in what sense can they exist prior to division?

Here is my answer:

Possible parts are what is represented in intuitions₁. Since division is brought about by synthesis, and only intuitions₂ are synthesized, it is then easy to see in what sense possible parts exist prior to division.

This explains why I take Kant to subscribe to

(MC₂) While mereological facts are concept-dependent, the *existence* of the objects that can stand in mereological relations is not—so the obtaining of mereological facts doesn't bring new objects into existence.

The objects that can stand in mereological relations to another are already present before synthesis, that is, before the division, in that they are represented in intuitions₁. On this picture, division doesn't *create* new objects, but merely leads to new *relations* between existing objects—just as the synthesis of the understanding doesn't create *new* representations, but makes given representations *conscious*. Since division is said to be a kind of synthesis, this analogy is worth preserving,

and this is the reason why I consider the de re reading of possible parts to be the more natural interpretation.¹⁷

Now, there are two pressing questions about this proposal: First, does it make sense to say that intuitions₁ represent parts—which presumably are *objects*—at all? And secondly, there is the worry that there are *too many* possible parts to be all represented at the same time. Although it is less basic, let us nevertheless start with the second point.

Why think there are too many possible parts? Remember that according to Kant, objects are infinitely divisible, which means that for any parts that are already actual, we can always actualize further parts. What is thus actualized are possible parts. But if division can go on and on until infinity, this clearly requires that there are *infinitely many* possible parts. And it is natural to worry whether Kant can admit that such an *actual* infinity of parts is representable at all.

To alleviate this worry, a look at Kant's reaction to the mathematician Kästner will be helpful. Kästner argues that in order to do geometry, we don't need to assume infinite quantities. What matters is rather that we can construct lines and other geometrical figures of *arbitrary* sizes, which may well all be finite. He thus questions the claim that geometry is only possible if we assume the existence of an *infinite* space (Onof & Schulting 2014).

Replying to this, Kant partly agrees with Kästner, in that geometrical figures which are actually *constructed* are all finite. He, however, argues that such constructions need to be *grounded* in an infinite space, which makes the existence of figures of arbitrary sizes possible in the first place. Kant calls this underlying space *metaphysical space*, and holds that it is not constructed but rather *given* (Kästner 20:419). Furthermore, he explicitly endorses that the kind of infinity in question is an *actual* infinity:

Now one cannot name a magnitude, in comparison with which each assignable [unit] of the same type is only equal to a part of it, anything other than **infinite**. Thus, the geometer, as well as the metaphysician, represents the original space as infinite, in fact as infinitely given. [...]

[...] the mathematician is always only concerned with an *infinito potentiali* [a potential infinite], and [that] *actu infinitum* (the metaphysically given [infinite]) *non datur a parte rei, sed a parte cogitantis* [an infinite in actuality is not given on the side of the thing, but on the side of the thinker]; this latter mode of representation is however not thereby fabricated and false, but rather lies at the foundation of the infinitely progressing constructions of geometrical concepts [...] (Kästner 20:419, 421; translations in square brackets by Onof and Schulting)

17. Admittedly, this is not a knockdown argument against the de dicto reading, because it used to be quite common to interpret the process of synthesis in a more creationist way (Tolley 2017: fn. 26). I will give some more reasons for preferring my reading later.

This shows that Kant doesn't have a problem with actual infinities *in general*. The picture he has in mind seems to be this: Particular geometric objects, like lines and circles, need to be *constructed* by the understanding, and are as such always finite (Kästner 20:420). However, this construction is not a *creation ex nihilo*—otherwise why would we need to assume the existence of a metaphysical space that makes it possible? Rather, construction involves working *in* this metaphysical space somehow, and it is tempting to think that—like synthesis—it makes certain geometrical figures conscious, by bringing them under a concept. If that is correct, the metaphysical space can be said to contain an actual infinity of points, lines, and so on, which are however not represented as such before construction.

So far we have concerned ourselves with pure geometry. For the mereological case, we need to deal with empirical objects though, and so sensation must come in somewhere. I already pointed out that the affection of objects produces sensations, which in turn are put into space. Now I want to make this more precise: The sensations are put into the actually infinite *metaphysical space*. And this in turn explains why there can be infinitely many possible parts: Since sensations are put into metaphysical space, it is plausible that the empirical objects thus represented in this space share the properties of the underlying space—and so there can be an actual infinity of empirical objects, which just are the possible parts. The worry about quantity can thus be dispelled.

Granted, this is somewhat speculative, since Kant mentions sensations in the Kästner treatise only once as a side-note (Kästner 20:422). But I think considerations of symmetry support the interpretation. With regard to pure geometry, we have the following picture:

Metaphysical Space	Geometrical Spaces
Actually infinite Given	Each has finite size Constructed

What I suggest is that the mereological case is structurally analogous, the main difference being the presence of sensation:¹⁸

¹⁸. The idea behind my interpretation can also be expressed in a different way, using the following distinction Kant draws:

Appearances, to the extent that as objects they are thought in accordance with the unity of the categories, are called *phaenomena*. (CPR A248–249)

As I understand this, *phaenomena* are appearances which are *determined* by using the categories, and presumably also empirical concepts—compare CPR A20/B34, where appearances are called *undetermined* objects of intuitions. Accordingly, it makes sense to classify possible parts as mere (undetermined) *appearances* and actual parts as *phaenomena*, and so on my interpretation there can be an actual infinity of appearances in the merely sensible metaphysical space, whereas the number of *phaenomena*, which require conceptualization, is always finite. Since Kant doesn't

Possible Parts	Actual Parts
Actual infinity Given by Sensibility	Finite number Divided by Synthesis

This analogy doesn't merely help to alleviate the cardinality worry, but also provides a further reason to prefer the *de re* reading of possible parts, according to which the process of division does not create new objects. In the dispute with Kästner, it is clear that Kant wants to ground the *possibility* of arbitrary geometrical constructions in something *actually* infinite, namely metaphysical space. It would then seem unwise to say that the possibility of arbitrary divisions need not likewise be grounded in something actually infinite (namely the possible parts), for if that works for mereology, why shouldn't we also side with Kästner in the debate about geometrical construction? Unless some explanation is given here, considerations of symmetry favour the *de re*- over the *de dicto* reading, and I will thus set the latter aside.¹⁹

Let us now move on to the first, more general worry: Does it make sense to talk about there being possible parts, which presumably are objects, in intuitions₁ at all? This doubt arises because Kant repeatedly tells us that we need *concepts*, in particular the categories, to represent *objects*. Concepts, however, only come into the picture through synthesis, and hence in *intuitions*₂. How does that fit together?

I agree that this requires some explanation. On a strong understanding of the concept of an object, which includes its standing in causal relations, the representation of objects does require concepts. But there are weaker, more basic notions of object, and objects in a more minimal sense may be represented in intuitions₁. Take, for instance, Allais's notion of a *particular*:

[...] 'particular' should [be] understood minimally, as a thing which a subject singles out as a perceptual unit—a distinct, bounded thing to which the subject can pay perceptual attention. This could be a causally unitary object, but could also be less than, or more than, an object. A subject may intuit, for example, a desk and the lamp attached to it, or may attend just to the light bulb in the lamp. A spot of light moving on a wall could be a perceptual particular—it is something outside of and other than the subject, that the subject can pick out as a unit. (Allais 2015: 147 fn. 2)

use the appearances/phaenomena-distinction very consistently I won't rely on it in the main text though.

19. It would nevertheless be interesting to see whether the *de dicto* reading could be developed further so as to overcome these problems, for instance by drawing on Kant's idea that to be *actual* is to stand "in one context with a perception in accordance with the laws of the empirical progression" (CPR A493/B521).

For representing particulars, arguably all that is needed is the spatiotemporal framework, and sensations occupying certain space-time regions. Since all of this is available in intuitions₁, we are free to claim that possible parts are particulars.

This gives rise to a third objection though: According to Mereological Conceptualism, possible parts don't stand in mereological relations to each other. But how can they fail to do so? Consider an intuition₁ of a house, which has windows and a door. Isn't it clear that, in some sense, the windows are represented as being *parts* of the house?

This is indeed a natural thought, but it can be resisted. What we can agree on is that, in some sense, the window is represented as spatially overlapping the house: It occupies part of the space occupied by the house.²⁰ But the holding of mereological relations is a further step, which only follows if we accept what Simons calls the *geometric correspondence principle*:

(GCP) Any extended object has [actual] parts corresponding to the parts of the region it occupies. (Simons 2004: 372)²¹

And it is clear that Kant has to reject (GCP) anyway, since otherwise due to the structure of space every object has an actual infinity of actual parts. So this objection can be put aside as well.

In this section, I have presented my answer to (Q₂): Possible parts exist prior to division insofar as they are already represented in intuitions₁, before any synthesis takes place, and I have thereby explained why I take Kant to hold (MC₂): Division doesn't literally create new objects. Now it is time to tackle the problem of division itself: In what sense exactly does synthesis *divide*?

4.4. Quantity and Measures

As it turns out, looking at Kant's theory of quantities will be useful for understanding the process of division. Fundamentally, Kant distinguishes between two

20. Often, overlap is defined in the following mereological way:

x overlaps y iff there is a z , such that z is part of x and z is part of y .

This is unacceptable for us, we rather need something like:

x overlaps y iff there is a region of space z , such that z is part of the region of space occupied by x , and z is part of the region of space occupied by y .

Analogously, it is possible to define other 'proto-mereological' relations by invoking the mereological relations of the underlying space. On my interpretation, Kant's stance on possible parts is similar to the 'liberalism' described in Magidor (2016).

21. I have inserted 'actual', a version of (GCP) for *possible* parts would be unproblematic, since they don't stand in mereological relations.

kinds of quantities:²²

Each quantum is either continuous <*continuum*> or discrete <*discretum*>. A quantum through whose magnitude the multitude of parts is undetermined is called continuous <*continuum*>; it consists of as many parts as I want to give it, but it does not consist of individual parts. Each quantum, on the other hand, through whose magnitude I want to represent the multitude of its parts, is discrete <*discretum*>. (M-Pölitz 28:561)

Discrete quantities have a fixed number of parts, whereas how many parts a continuous quantity has is left open. As indicated, however, *we* can apparently determine ('give') the number of parts of continuous quantities. This is confirmed by a further distinction Kant draws:

A discrete quantum <*quantum discretum*> must be distinguished from a continuous quantum <*quanto continuo*> which is represented as discrete <*discretum*>. A quantum in which I determine the parts is discrete <*discretum*>, but not in itself <*per se*>. A quantum continuous in itself <*quantum continuum per se*> is one in which the number of parts is indeterminate; a quantum discrete in itself <*quantum discretum per se*> is one in which the number of parts is arbitrarily determined by us. (M-Pölitz 28:561)

So continuous quantities can be represented as discrete in some way—but how exactly? In another lecture note, Kant thankfully discusses a concrete example of what he has in mind. He considers temporal quantities, and brings up the case of an *hour* (M-Volck 28:423–424). Since time is assumed to be infinitely divisible, an hour is a continuous quantity. However, we can represent it as discrete, for instance as made up of 60 *minutes*. This, however, is no unique decomposition: Since minutes themselves can be represented as composed of 60 seconds, the hour we started with might as well be taken to consist of 3600 seconds.²³ This shows that different representations are made possible because there are different *units of measurement* that can be employed.

The idea that we can represent a continuous quantity in multiple ways using different measures gives us a model for how to understand Kant's notion of division. This view is supported by the fact that Kant himself brings up the distinction between continuous and discrete quantities when discussing the antinomies:

The infinite division indicates only the appearance as *quantum continuum* and is inseparable from the filling of space; for the ground of its infinite

22. For helpful discussions of Kant on quantity see Parsons (1992) and Longuenesse (1998: Ch. 9).

23. Naturally, the same holds for space, which can be represented using metres, centimetres, feet, inches, etc.

divisibility lies precisely in that. But as soon as something is assumed as a *quantum discretum* the multiplicity of units in it is determined; hence it is always equal to a number. (CPR A527/B555)

The question now is how exactly this analogy works. In the hour-example we used different measures to achieve different decompositions. We know that decomposition is supposed to be a kind of synthesis. In order to bring these ideas together, we need to understand the role measures could play in the process of synthesis.

Consider the general structure of cognition as described above:

As mentioned, the smaller rectangles in intuition₂ signify that certain representations have been made conscious. However, it is certainly possible that a synthesis makes *more* or *fewer* representations conscious, thereby resulting in a more fine- or coarse-grained consciousness of the objects represented in the given intuition₁:

Consequently, something must determine *which* of the representations contained in an intuition₁ the synthesis makes conscious. In order to explain that, Kant introduces the notion of a *basic measure*, which is a quantity that can be grasped *at once*, that is, without being a product of synthesis itself (CJ 5:251–252). The basic measure is then in turn used to synthesize intuitions₁. This only partly answers our question though, since one can now ask: What determines which basic measure we employ? Kant is not too explicit about this, but, following Golob and Allais (Golob 2014: 5; Allais 2015: 171 fn. 46; see also Longuenesse 1998: 273), the following theory seems plausible:

The basic measure is determined both by *natural* factors and *concept possession*. We cannot become conscious of arbitrarily small parts of an object we see, contingent limitations of our senses must thus be taken into account.²⁴

On the other hand, if we possess sophisticated concepts, we can draw finer distinctions in perception than we could do without them (see *Logic* 9:33; *Anthro* 7:419).

On this view, measures play a crucial role in the process of synthesis: They determine to which extent the available intuitions₁ are made conscious. With this idea at hand, we can now finally understand how parts become actual.

4.5. Answering (Q₁): Decomposition

The crucial question was:

(Q₁) How does a possible part become actual?

Here is my suggestion:

A part *x* of some object *y* is *actual* iff *x* is a possible part of *y*, and an intuition₁ of *y* has been synthesized with a concept *C* such that *x* is *consciously represented* as part of *y*.

The idea is that, like an hour consists of 60 minutes insofar as it is represented using the measure *minute*, every object consists of actual parts insofar as it is represented as such with the aid of some suitable concept *C*. Since we are working in an idealist setting, this should not merely be read as a claim about our *perception* of mereological relations, but as a metaphysical claim: The fact that we represent some object as composite *makes it the case* that the relevant mereological facts obtain:²⁵

24. Compare Kant's example of the pyramid:

This makes it possible to explain a point that Savary notes in his report on Egypt: that in order to get the full emotional effect of the magnitude of the pyramids one must neither come too close to them nor be too far away. For in the latter case, the parts that are apprehended (the stones piled on top of one another) are represented only obscurely, and their representation has no effect on the aesthetic judgement of the subject. In the former case, however, the eye requires some time to complete its apprehension from the base level to the apex, but during this time the former always partly fades before the imagination has taken in the latter, and the comprehension is never complete. (*CJ* 5:252)

25. For a more general discussion of this idea see Kriegel (2012) and Pearce (2017).

And this leads us to the first tenet of Mereological Conceptualism:

(MC₁) Mereological facts such as ' x is part of y ' obtain in virtue of x being represented as a part of y using some concept C .²⁶

In addition to making sense of decomposition, (MC₁) also sheds new light on the presupposition we encountered in the discussion of Thesis and Antithesis of the Second Antinomy. There I argued that Kant rejects the principle (Det) in favour of its negation:

(¬Det) For composite substances, which and how many parts they have is *indeterminate*.

I suggested that we take this to mean that what actual parts an object has can change as the result of a process of division. Now we can better understand what this amounts to, since according to MC dividing an object is achieved by representing it as divided. Given this, the distinction between Kant and the metaphysicians he criticizes becomes much clearer: Transcendental realists hold that mereological facts are determinate in the sense that they obtain independently of representations and concept-application, while Kant denies this.

One might still wonder whether there is not a sense in which according to MC everything is completely determinate, since on my interpretation what *possible* parts exist is independent of how we represent things. With this I can happily agree, because, on the de re reading of possible parts, what is determinate here are not mereological facts as such, but merely facts about the relata that could stand in mereological relations. Reading (Det) and (¬Det) as applying to actual parts only then still gives us a clear sense in which for Kant facts about *parthood* are indeterminate, which distinguishes his position from traditional metaphysicians.

26. Does this mean that mereological facts obtain only relative to the subject who synthesizes the relevant intuition₁? That is one way to understand the proposal, but probably not the best: It strikes me as preferable to draw on the idea that for Kant, there is a sense of *experience* in which all subjects share the same experience (Stephenson 2015), and in virtue of that mereological facts could then obtain also for subjects who did not themselves do the synthesizing.

And as we saw in Section 4.3, it is plausible to treat possible parts differently from actual parts in this respect anyway.

We now have a good understanding of what Mereological Conceptualism amounts to, and saw that it provides answers to the crucial questions (Q₁) and (Q₂). In the next section, I will strengthen the case for MC by showing that it fulfils three further conditions: MC can explain how division can proceed to infinity, why we can never make all possible parts actual, and what the role of phenomenological limitations on divisibility is.

5. Testing the Theory

5.1. Infinite Divisibility

I will test my interpretation of Kant's mereology by seeing whether it can make sense of important claims Kant makes about divisibility. The first success condition is the following:

INFINITE DIVISIBILITY

The theory must explain why the division of a whole can be repeated until infinity.

We already saw quotes showing that Kant claims that matter is infinitely divisible, here is another clear statement of this:

Matter is *divisible to infinity*, and, in fact, into parts such that each is matter in turn. (MAN 4:503)

It thus seems fair to demand that any interpretation of his mereology should explain why this is so. More specifically, what needs to be explained is how it is that for any given object *y*, it is possible to synthesize an intuition₁ of *y* with some concept *C* in such a way as to make it true that some *x* is a (proper) part of *y*.

Since with Kant we assume space to be infinitely divisible, and we have possible parts corresponding to regions of space, there will be no shortage of possible parts which are candidates for standing in the parthood-relation to any *y*. But, one might wonder, are there also sufficiently many *concepts*, which are needed for the synthesis that makes mereological facts obtain?

Luckily, the answer is yes. According to Kant, geometrical construction can be used to create new measures (CPR A713–714/B741–742). Coming back to the example of the hour from above, we can represent it using minutes, seconds, milliseconds, microseconds, nanoseconds, and so on. Analogously, objects in space can be synthesized using many different measures (or, more likely, empirical concepts which to some extent incorporate measures). Importantly, for any

measure m , we can construct a new measure which is finer than m , and so we will never reach a stage at which some object in space cannot in principle be represented using a finer measure. There is thus no danger of running out of concepts which are needed to constitute mereological facts—infinite divisibility is thus secured, and the first success condition can be fulfilled.

5.2. No Infinite Division

The next success condition is closely related:

NO INFINITE DIVISION

The theory must explain why it is impossible to make *all* parts actual.

Prima facie, one might think that it should in principle be possible to *complete* the division of some piece of matter, thereby making all its possible parts actual. Kant, however stresses that this is not so:

[I]t does not follow, from the fact that its division proceeds to infinity, that the divisible contains an infinite aggregate of parts *in itself*, and outside of our representation. For it is not the thing, but only this representation of it, whose division, although it can indeed be continued to infinity, and there is also a ground for this in the object (which is unknown in itself), can nonetheless never be completed, and thus be completely given; and this also proves no actual infinite aggregate in the object (which would be an explicit contradiction). (MAN 4:507)

Once again, it is then reasonable to demand that an interpretation of Kant's views explains why this is the case.

Here is what Kant himself says by way of motivating his rejection of infinitely many actual parts:

But one cannot admit that matter, or even space, *consists of infinitely many parts* (because it is a contradiction to think an infinite aggregate, whose concept already implies that it can never be represented as completed, as entirely completed). (MFNS 4:506)

The important thought here is that there is a problem about representing an actual infinity, which then in turn explains why we cannot actualize all of the infinitely many possible parts. MC can account for this well: For all parts of some object y to be actual, there would have to be infinitely many facts of the form ' x is part of y '. For each of these facts, in turn, there has to be a corresponding synthesis-process that makes it the case that the fact obtains. And the problem

then is that no subject could ever complete all the synthesis-processes that are needed to make all possible parts actual.²⁷

Things are not quite as straightforward, however. Arguably, it is not the case that to each mereological fact there corresponds exactly one synthesis-process. It seems very plausible that if we synthesize some intuition₁ with a complex concept, this synthesis can make it the case that a variety of mereological facts obtain. And if that is so, there is room for the possibility that there is some concept *C* such that if we use it to synthesize an intuition₁, *all* the possible parts represented in it are made actual at once. Kant thus needs some argument to show that there is no concept which allows this feat.

To understand why such a concept cannot exist, take once again the case of an hour: Is there some concept which represents an hour as made up of minutes, seconds, milliseconds, ... *all at once*? One might think that the general concept *measure of time* can do this job:

But it seems that if we represent an hour using such a general concept, we don't represent it as being made up of all the possible time measures *at once*—rather, we represent it unspecifically as consisting of *some amount of time or other*.

If we genuinely want to represent an hour in all possible ways, we need a *specific* concept that includes all possible measures:

However, as we saw earlier, there are potentially infinitely many measures. If the

27. This still holds if several subjects jointly try to represent all possible parts, unless we assume that there is an actual infinity of synthesizing subjects—a possibility Kant seems to ignore. And if we assume that supertasks are possible, then one subject can in fact make all possible parts actual, for instance if for every synthesis-process of *y*, the next synthesis takes half the time of the previous one. Although it sounds bizarrely far-fetched, Kant actually considers a similar case: In the *MFNS*, he discusses a process of chemical penetration which “contains a *completed* division to infinity” that is said to be possible “because the dissolution takes place continuously throughout a time, and thus equally through an infinite series of moments with acceleration” (*MFNS* 4:531).

putative concept *C* existed, it would thus have to contain *infinitely many* other concepts. However, Kant unambiguously rejects the possibility of such concepts:

[...] no concept, as such, can be thought as if it contained an infinite set of representations *within itself*. (CPR B40)

Naturally, this line of argument is not restricted to measures of time: It applies to space as well. And that is the reason why it is impossible to actualize all possible parts of an object at once in the way envisaged: To achieve this we would need an infinitely complex measure-concept, and Kant doesn't think there are such concepts.²⁸ Given this further commitment, MC can thus also vindicate the second success condition.

5.3. Phenomenology

The last condition emerges when one considers the overall plausibility of Kant's position. We know now that division can proceed to infinity, and also that division has something to do with representing parts. However, it is also clear that we *cannot* consciously represent arbitrarily small parts of objects—at a certain size we become unable to perceive finer distinctions. Hume puts this very nicely:

'Tis therefore certain, that the imagination reaches a minimum, and may raise up to itself an idea, of which it cannot conceive any sub-division, and which cannot be diminished without a total annihilation. When you tell me of the thousandth and ten thousandth part of a grain of sand, I have a distinct idea of these numbers and of their different proportions; but the images, which I form in my mind to represent the things themselves, are nothing different from each other, nor inferior to that image, by which I represent the grain of sand itself, which is suppos'd so vastly to exceed them. (Hume 2003: 19–20, *Treatise*, Part II, Section I)²⁹

This phenomenological observation certainly shouldn't be denied. The question then is to what extent the process of division Kant describes has a phenomenological element, and how relevant our finite powers of representation are to it. Without an answer, an interpretation of his views would be incomplete, hence the third condition:

PHENOMENOLOGY

The theory must explain whether division is a process with a certain

28. Kant also explicitly discusses and rejects the existence of 'organic wholes', which are infinitely complex (CPR A526–527/B554–555). This seems to be directed against Leibniz, who accepted such organic wholes and the corresponding infinitely complex concepts, see Anderson (2015: 125–130, 312).

29. See also Parsons (1964: 188–191) and (1973: 20).

phenomenology, and how it is compatible with our finite perceptual capacities.

According to MC, division amounts to synthesizing an intuition₁ with some concept *C*. Which parts are actualized depends on what concept we use. However, it is plausible to suppose that which parts *can* be made actual by concepts in the first place depends on the nature of the intuition₁ we are dealing with. Kant, for instance, points out that the *fineness* of our sense organs makes a difference to how much we are able to consciously perceive (CPR A226/B273). And he describes the difference between perceiving something with our eyes and looking at the same object through a microscope thus:

Everything the assisted eye discovers by means of the telescope (perhaps directed toward the moon) or microscope (directed toward infusoria) is seen by means of our naked eyes. For these optical aids do not bring more rays of light and thereby more created images into the eye than would have been reflected in the retina without such artificial tools, rather they only spread the images out more, so that we become conscious of them. (*Anthro* 7:135–136)

In light of this, the Kantian thesis that it is possible to continue division until infinity should be revised somewhat: Since, as Hume pointed out in the quote above, our senses don't allow us to make arbitrary small divisions conscious, the thesis is not that our *actual* senses support infinite divisibility. Rather, what Kant plausibly has in mind is that there could in principle be *finer* senses than ours which allow to make arbitrarily fine divisions conscious (see CPR A226/B273).³⁰ We can be sure that finer and finer senses are possible, since there is no danger of reality being atomistic—due to the infinite divisibility of space, finer discrimination is always an option. Given these clarifications, MC can thus also fulfil the last success condition. My case for it is now complete.

6. Conclusion

Over the course of this paper, we have seen that Kant's few positive remarks about mereology can be fleshed out into a coherent account. By way of conclusion, I want to mention two aspects of Kant's position that require further exploration.

30. Note however that I don't want to say that finer senses deliver intuitions₁ that contain *more* possible parts than those which result from our human senses: I take Kant's remark that "optical aids do not bring more rays of light and thereby more created images into the eye" to mean that in some sense, an intuition₁ represents even those objects that we cannot bring to consciousness.

First, according to Kant the Antinomies provide an indirect argument for transcendental idealism (*CPR* A506/B534): Because a transcendental realist will have compelling arguments for both Thesis and Antithesis, they end up with a contradictory view. A transcendental idealist does not have this problem, since they can declare both theses false. Importantly though, for Kant's indirect argument to work, we don't merely need to show that accepting transcendental idealism is *one* way to maintain a third alternative to Thesis and Antithesis (which we arguably have established), but that it is the *only* way. In other words, we need an argument that one cannot accept Mereological Conceptualism and at the same time reject an idealist view of space and time. And this would seem to require further work, for although (MC₁) certainly makes most sense within an idealist framework, Kant requires a stronger form of incompatibility.

Secondly, there are important passages in which Kant stresses the connection between mereological composition and *causality*. In the Third Analogy, for instance, Kant says that "appearances, insofar as they stand outside one another and yet in connection, constitute a composite" when there is reciprocal (causal) influence between them (*CPR* A214–215/B261–262), and similar remarks can be found in the Metaphysical Deduction (*CPR* B112). What I said in this paper doesn't suffice to illuminate the role of causality in composition, since for that we would need to take a more in-depth look at the *Metaphysical Foundations of Natural Science* which goes beyond the Dynamics chapter. This cannot be achieved here and now, but I hope that my interpretation provides a useful starting ground for such investigations.

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References

Allais, Lucy (2009). Kant, Non-Conceptual Content and the Representation of Space. *Journal of the History of Philosophy*, 47(3), 383–413.

- Allais, Lucy (2015). *Manifest Reality: Kant's Idealism and His Realism*. Oxford University Press.
- Allais, Lucy (2016). Conceptualism and Nonconceptualism in Kant: A Survey of the Recent Debate. In Dennis Schulting (Ed.), *Kantian Nonconceptualism* (1–25). Palgrave-Macmillan.
- Anderson, R. Lanier (2015). *The Poverty of Conceptual Truth: Kant's Analytic/Synthetic Distinction and the Limits of Metaphysics*. Oxford University Press.
- Bennett, Jonathan (1974). *Kant's Dialectic*. Cambridge University Press.
- Conant, James (2016). Why Kant Is Not a Kantian. *Philosophical Topics*, 44(1), 75–125.
- Engelhard, Kristina (2005). *Das Einfache und die Materie*. De Gruyter.
- Euler, Leonhard (1835). *Letters of Euler on Different Subjects in Natural Philosophy: Addressed to a German Princess* (Vol. 2). Harper.
- Falkenburg, Brigitte (1995). Kants zweite Antinomie und die Physik. *Kant-Studien*, 86(1), 4–25.
- Falkenburg, Brigitte (2000). *Kants Kosmologie. Die Wissenschaftliche Revolution der Naturphilosophie im 18. Jahrhundert*. Klostermann.
- Friedman, Michael (2013). *Kant's Construction of Nature: A Reading of the Metaphysical Foundations of Natural Science*. Cambridge University Press.
- Golob, Sacha (2014). Kant on Intentionality, Magnitude, and the Unity of Perception. *European Journal of Philosophy*, 22(4), 505–528.
- Grier, Michelle (2001). *Kant's Doctrine of Transcendental Illusion*. Cambridge University Press.
- Grüne, Stefanie (2009). *Blinde Anschauung: Die Rolle von Begriffen in Kants Theorie sinnlicher Synthesis*. Klostermann.
- Holden, Thomas (2004). *The Architecture of Matter: Galileo to Kant*. Oxford University Press.
- Hume, David (2003). *A Treatise of Human Nature*. Dover Publications.
- Kant, Immanuel (1900–). *Gesammelte Schriften*. Preußische [Deutsche] Akademie der Wissenschaften.
- Kant, Immanuel (1997). *Lectures on Metaphysics*. Karl Ameriks and Steve Naragon (Eds. and Trans.). Cambridge University Press.
- Kant, Immanuel (1998). *Critique of Pure Reason*. Paul Guyer and Allen W. Wood (Eds. and Trans.). Cambridge University Press.
- Kant, Immanuel (2002). *Theoretical Philosophy after 1781*. Gary Hatfield, Michael Friedman, Henry Allison and Peter Heath (Eds. and Trans.). Cambridge University Press.
- Kant, Immanuel (2006). *Anthropology From a Pragmatic Point of View*. Robert B. Loudon (Ed. and Trans.). Cambridge University Press.
- Kant, Immanuel (2014). On Kästner's Treatises (Dennis Schulting and Christian

- Onof, Trans.). *Kantian Review*, 19(2), 305–313.
- Kemp Smith, Norman (1918). *A Commentary to Kant's 'Critique of Pure Reason'*. Palgrave-Macmillan.
- Kriegel, Uriah (2012). Kantian Monism. *Philosophical Papers*, 41(1), 23–56.
- Longuenesse, Béatrice (1998). *Kant and the Capacity to Judge: Sensibility and Discursivity in the Transcendental Analytic of the "Critique of Pure Reason"*. Princeton University Press.
- Magidor, Ofra (2016). Endurantism vs. Perdurantism?: A Debate Reconsidered. *Noûs*, 50(3), 509–532.
- Malzkorn, Wolfgang (1998). Kant über die Teilbarkeit der Materie. *Kant-Studien*, 89(4), 385–409.
- Malzkorn, Wolfgang (1999). *Kants Kosmologie-Kritik. Eine formale Analyse der Antinomienlehre*. De Gruyter.
- McLear, Colin (2014). The Kantian (Non)-conceptualism Debate. *Philosophy Compass*, 9(11), 769–790.
- Melnick, Arthur (1973). *Kant's Analogies of Experience*. University of Chicago Press.
- Onof, Christian and Dennis Schulting (2014). Kant, Kästner and the Distinction between Metaphysical and Geometric Space. *Kantian Review*, 19(2), 285–304.
- Parsons, Charles (1964). Infinity and Kant's Conception of the "Possibility of Experience". *Philosophical Review*, 73(2), 182–197.
- Parsons, Charles (1992). Arithmetic and the Categories. In Carl J. Posy (Ed.), *Kant's Philosophy of Mathematics. Modern Essays* (135–158). Kluwer Academic Publishers.
- Pearce, Kenneth L. (2017). Mereological Idealism. In Tyron Goldschmidt and Kenneth L. Pearce (Eds.), *Idealism: New Essays in Metaphysics* (200–216). Oxford University Press.
- Schafer, Karl (2017). Intuitions and Objects in Allais's *Manifest Reality*. *Philosophical Studies*, 174(7), 1675–1686.
- Schmiege, Oscar (2006). What is Kant's Second Antinomy About. *Kant-Studien*, 97(3), 272–300.
- Schulting, Dennis (2010). Kant's Idealism: The Current Debate. In Dennis Schulting and Jacco Verburgt (Eds.), *Kant's Idealism* (1–25). Springer.
- Simons, Peter (2004). Extended Simples. *The Monist*, 87(3), 371–85.
- Stang, Nicholas (2015). Who's Afraid of Double Affection? *Philosophers' Imprint*, 15(18), 1–28.
- Stang, Nicholas (2016). Kant's Transcendental Idealism. In Edward N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Spring 2016 ed.). Retrieved from <https://plato.stanford.edu/entries/kant-transcendental-idealism/>
- Stephenson, Andrew (2015). Kant, the Paradox of Knowability, and the Meaning of 'Experience'. *Philosophers' Imprint*, 15(27), 1–19.

- Tolley, Clinton (2013). The Non-Conceptuality of the Content of Intuitions: A New Approach. *Kantian Review*, 18(1), 107–136.
- Tolley, Clinton (2017). Kant on the Place of Cognition in the Progression of our Representations. *Synthese*. Advance online publication. <https://doi.org/10.1007/s11229-017-1625-3>
- Vaihinger, Hans (1892). *Commentar zu Kants Kritik der reinen Vernunft. Zweiter Band*. Union Deutsche Verlagsgesellschaft.
- van Cleve, James (1999). *Problems from Kant*. Oxford University Press.
- Varzi, Achille (2016). Mereology. In Edward N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2016 ed.). Retrieved from <https://plato.stanford.edu/entries/mereology/>
- Watt, Robert (in press). Three Myths about Kant's Second Antinomy. *Archiv für Geschichte der Philosophie*.