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## Infinity and givenness: Kant on the intuitive origin of spatial representation

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I advance a novel interpretation of Kant's argument that our original representation of space must be intuitive, according to which the intuitive status of spatial representation is secured by its infinitary structure. I defend a conception of intuitive representation as what must be given to the mind in order to be thought at all. Discursive representation, as modelled on the specific division of a highest genus into species, cannot account for infinite complexity. Because we represent space as infinitely complex, the spatial manifold cannot be generated discursively and must therefore be given to the mind, i.e. represented in intuition.

**Keywords:** Kant; intuition; sensibility; space; infinity; continuum; singular representation

Space is represented as an infinite **given** magnitude. (*Critique of Pure Reason*, B39)<sup>1</sup>

Kant's distinction between sensibility and understanding is arguably the keystone of his critical enterprise. His detailed account of this dichotomy ought therefore to be one of the most controversial aspects of his system. Of course, the history of philosophy abounds with versions of some broad contrast between 'intellect' and 'sense' or between 'higher' and 'lower' cognitive faculties. This historical prevalence can mask the heterodoxy of Kant's account, but its strangeness becomes glaring in light of his unprecedented claim that our knowledge of the infinite (and, indeed, all our knowledge of pure mathematics) is ultimately grounded in *sensibility*. Kant himself was eager to emphasize the originality and importance of his critical distinction between conceptual and intuitive representation (cf. A271/B327). Yet one is hard-pressed to find direct and explicit arguments for the details of these distinctions in Kant's published critical writings. Indeed, it can seem that the *Critique* and the *Prolegomena* begin by presupposing, stipulating or otherwise hypothesizing certain robust conceptions of judgement, intuition, conceptual representation, mathematical cognition, etc. and then proceed to demonstrate (with more or less success) the fruitfulness of

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these conceptions indirectly, by showing how they (alone?) serve to resolve various philosophical difficulties.<sup>2</sup> In what follows, I will resist this impression and suggest that Kant does, in fact, provide the materials for an extended argument in favour of his nuanced conceptions of conceptual and intuitive representation over the course of the Aesthetic and Analytic. I will confine myself to one brief but crucial stage of that argument, which bears on his account of sensible, intuitive representation. My focal point will be the penultimate section of the Metaphysical Exposition of the Concept of Space,<sup>3</sup> which argues that our original representation of space is intuitive. The reason for this focus is simple. Any argument to the effect that a given representation is intuitive must trade on a particular conception of what intuitive representation consists in. Accordingly, a satisfactory interpretation of the latter MEs must spell out Kant's conception of intuition at that point in the *Critique*. And the adequacy of any such interpretation will depend, in part, on how plausible it is to suppose that Kant is entitled to that conception at the relevant stage in his argument. I will propose that Kant articulates a functional conception of sensibility as the ability to be given objects that exist independently of our spontaneous acts of thought. The penultimate ME, then, seeks to show that our concept of space must derive from such an object-giving representation. It shows this, I will argue, by observing that discursive acts of thought cannot account for the infinity structure of space – in particular, its continuity and open-endedness. Consequently, such an infinity manifold must (originally) be given to us in order to be thought at all and is, *ipso facto*, represented in sensible intuition (insofar as it is represented at all). One advantage of this reading is that it enables us to identify a stage in Kant's 'synthetic' or progressive argument for his distinctive account of intuitive representation. If the argument that spatial representation is intuitive principally turns on the infinity structure of space and a conception of intuition as object-giving, and if the arguments for the apriority of space are sound, it follows that all outer intuitions are singular representations, because they necessarily represent unique portions of a single, essentially unitary space. Thus, assuming parallel arguments can be made for time, the MEs collectively establish at least one crucial feature of Kant's conception of sensibility: namely the singularity of sensible representation. This is a step in a 'synthetic' argument in the sense that it enriches the conception of intuition with which we began – from *object-giving representation* to *singular, object-giving representation*.

Section 1 surveys the criteria of conceptual and intuitive representation that are typically invoked in reconstructions of the penultimate ME. I argue that none of these criteria can fund a textually and philosophically satisfying interpretation. Section 2 sketches the functional account of intuition Kant articulates and defends in the Introduction to the *Critique*. Section 3 deploys this functional conception in a novel interpretation of Kant's argument, on which the intuitive status of spatial representation follows from its infinity structure. Section 4 concludes by highlighting some consequences of my interpretation for an overall reading of the argumentative structure of the *Critique*.

## 1. The interpretive challenge posed by the penultimate ME

Space is not a discursive, or, as one says, a general [allgemeiner] concept of relations of things generally [überhaupt], but rather a pure intuition. For, first, one can only represent a unitary [einigen] space, and when one speaks of many spaces, one understands by that only parts of one and the same solitary [alleinigen] space. Nor can these parts precede the unitary, all-encompassing space as, so to speak, components [Bestandteile] (from which it might be composed [daraus eine Zusammensetzung möglich sei]); rather, they can only be thought **in it**. Space is essentially unitary [einig]; the manifold in it, and thus even the general concept of spaces as such [überhaupt] rests solely on limitations [Einschränkungen]. It follows from this that, with regard to space, all concepts of it are grounded upon an intuition a priori (one that is not empirical). (A24f./B39)

This passage clearly presupposes some criterion of intuitive and/or conceptual representation. For any argument to the effect that a certain representation is an intuition and not a concept must inevitably trade on some account of what intuitions and concepts are. Our interpretive challenge is to determine what the relevant differentiating criteria are and how they bear on the features of space (or spatial representation) Kant highlights.<sup>4</sup> To meet this challenge an interpretation must (a) provide ample and clear textual evidence that Kant adopted the criteria in question, (b) show that Kant might plausibly have taken himself to be entitled to invoke these accounts as premises at this point in the *Critique* and (c) by combining these accounts with what Kant explicitly says, yield an argument of sufficient cogency to have been endorsed by someone of Kant's philosophical acumen. The chart below outlines the criteria typically invoked by interpreters, along with citations that are often provided as textual evidence for them.<sup>5</sup>

<i>Criteria of intuitive representation</i>	<i>Criteria of conceptual representation</i>
<p><b>Singularity</b></p> <p>– Intuitions are essentially singular representations, i.e. they intrinsically refer to exactly one object as such. (<i>De Mundi</i> 2:402; <i>Logic</i> 9:91; B137; A320/B376f.)</p>	<p><b>Generality</b></p> <p>– Concepts are essentially general representations, i.e. they are intrinsically able to refer to indefinitely many objects. (<i>Logic</i> 9:91f.; A320/B376f.)</p>
<p><b>Holistic containment</b></p> <p>– The representations contained in an intuition are posterior to the intuition that contains them; i.e. the 'whole' is the ground of the possibility of the 'parts'. (A169f./B211f.)</p>	<p><b>Atomic containment</b></p> <p>– The representations contained in a concept are prior to the concept that contains them; i.e. a concept's constituent 'parts' (or marks) ground the possibility of the 'whole'. (<i>Logic</i> 9:35, 58; or 'traditional logic')</p>
<p><b>Immediacy</b></p> <p>– An intuition relates immediately to the object(s) it represents. (A19/B33; A320/B376f.)</p>	<p><b>Mediacy</b> (i.e. discursivity)</p> <p>– A concept relates to the object(s) to which it refers through mediating marks or features common to those objects. (<i>Logic</i> 9:58ff.; B33; A320/B376f.)</p>

Prevailing interpretations differ only in which of these criteria they invoke and whether they treat them as necessary and/or sufficient in tracing a valid argument to the desired conclusion.<sup>6</sup> Yet I will argue that no combination of these criteria provides a textually and philosophically compelling reconstruction of Kant's argument – i.e. one that meets our threefold interpretive challenge. Let's consider them in descending order.

It's quite natural to suppose that the above passage turns on the criteria of singularity and generality. First, the opening sentence seems to gloss 'discursive' as 'general', which suggests that the aim of the passage is to show that our representation of space is not a general representation. Moreover, the passage is peppered with phrases that seem to affirm the singularity (or at least particularity<sup>7</sup>) of space, as we represent it. For example, Kant claims that 'one can only represent a unitary [einen einigen] space', since any plurality of spaces represents only 'parts of one and the same solitary [alleinigen] space', which he goes on to describe as 'the unitary [einigen], all-encompassing space' and as 'essentially unitary [wesentlich einig]'.<sup>8</sup> These features have suggested to many commentators that Kant's argument is some version of the following:

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(1) Only intuitions are singular.	(1') All concepts are general.
(2) Our representation of space is singular.	(2') Our representation of space is singular.
(3) Our representation of space is intuitive.	(3') Our representation of space is not conceptual.

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This had better not be Kant's argument, however. For, as several commentators have observed, Kant seems to admit a variety of singular representations that are not intuitive, but conceptual.<sup>9</sup> He admits ideas of reason such as the *<ens realissimum>*<sup>10</sup> (A605/B633; cf. A568/B596), mathematical concepts such as *<sum of 7 and 5>* (B15; cf. A164/B205), pure concepts of the understanding such as *<substance>* (or *<matter>* cf. A182, B224), and empirical concepts such as *<coldest known temperature>* (cf. *Prolegomena*, 4:273). It is important here to distinguish various senses in which these concepts might be deemed 'singular'. Clearly, each purports to refer to exactly one thing. But it is also necessary, in one sense or another, that each refers to exactly one thing (provided it has reference at all). It is arguably a logical necessity that there can be no more than one most real being or coldest known temperature; it is a mathematical necessity that *<sum of 7 and 5>* refers to exactly one thing (namely 12); and it is, at least for Kant, a metaphysical necessity that there is but one (conglomeration of) matter or substance, which can neither increase nor decrease.

Now Kant famously declares that

it is a mere tautology to speak of general or common concepts – an error that arises from an incorrect categorization [Eintheilung] of concepts into general, particular, and singular. Not concepts themselves, but only their use [Gebrauch] can be so categorized. (*Logic* 9:91)

This might suggest that Kant would (or should) treat the concepts listed above, not as singular representations proper, but as general representations put to a singular use. Certainly the concept < coldest known temperature > invites such an analysis. And it is at least plausible to hold that the concept < substance > intrinsically admits of a plural and is therefore a general representation, even if philosophical considerations subsequently demonstrate that there can be but one substance proper (namely matter), so that the only legitimate use of < substance > is a singular one.

But other concepts do not yield so easily to such treatment. They seem not merely to have been put to a singular use, as when one accompanies a concept with the definite article or a demonstrative expression – as in ‘*the* sage of Königsberg’ or ‘*this* lame example’. They appear to satisfy a more ambitious notion of singularity, for they necessarily represent exactly one thing *as such*. The concept < sum of 7 and 5 > not only refers to exactly one object as a matter of mathematical necessity; it is also intrinsic to the content of the concept, on Kant’s view, that it ‘contains nothing more than the unification of both numbers *into a single one* [in eine einzige]’ (B15, my emphasis). Now, it is crucial to Kant’s theory of mathematical cognition that < sum of 7 and 5 > does not represent, as part of its content, *which* particular individual it refers to: < 12 > is not part of the content of < sum of 7 and 5 > nor *vice versa*.<sup>11</sup> But such an arithmetical concept is nevertheless a discursive representation of an individual as such, for it is part of the content of the concept that it refers to exactly one object (i.e. one number), even though we rely on intuition to determine *which* object that is. This is not a case of a general concept being put to a singular use, for the definite article in ‘the sum of 7 and 5’ is otiose: one can just as well say (as Kant often does) ‘a sum of 7 and 5’.<sup>12</sup> The representation, < sum of 7 and 5 >, owes its singularity to the content of the mathematical function it invokes (namely addition), not to the fact that it is (invariably?) put to a singular use.<sup>13</sup>

The essential singularity of < *entis realissimi* > is equally difficult to dispute. Kant is emphatic that the transcendental ideal is ‘the concept of a singular entity [einzelnen Wesens]’ (A576/B604; cf. A574/B602, A576/B604).<sup>14</sup> But he is also keen to emphasize the oddity of this concept, which is the only ideal human reason can conceive ‘because only in this unique [einzigem] case is an intrinsically [an sich] general concept thoroughly [durchgängig] determined through itself and cognized [erkannt] as the representation of an individual’ (A576/B604). Despite its ‘intrinsic generality’, the ideal is essentially singular not because it is put to a singular use, but because it contains the idea of thoroughgoing determination.<sup>15</sup> In particular, it is singular because it invokes a totality of possible predicates and picks out a determinate subset of them – namely those that express a ‘reality [Realität]’ rather than a ‘privation [Mangel]’. And this ought to alert us to an extensive family of essentially singular discursive representations: namely those thought through the pure category of the understanding, < totality >.<sup>16</sup> To argue that the singular purport of every totality concept is merely the result of an essentially general concept’s

having been put to a singular use is tantamount to banishing < totality > from the table of pure concepts of the understanding. Kant is adamant that, although ‘allness (totality) is nothing other than multiplicity considered as unity’, the former cannot be reduced to the latter:

For the combination of the first and second [categories in each heading] in order to bring forth the third requires a special act of the understanding, which is not identical to the act performed in the first and second [cases]. (B111)

That is to say, the category < totality > makes a distinctive cognitive contribution to the content of any concept thought through it – a cognitive contribution Kant links to the form of singular judgement in the *Metaphysical Deduction*.<sup>17</sup> If we were to suppose that the singularity of totality concepts is due solely to their use (rather than to their content), we could perhaps understand the need for a distinctively singular *form of judgement* (associated with the singular use of general concepts), but it would remain unclear what cognitive contribution < totality > might make to the *content* of such a judgement, thus meriting it a place among the pure categories of quantity.

In view of this proliferation of essentially singular discursive representations, it should be clear that no simple appeal to the singularity of intuition can secure the sensible, non-conceptual status of spatial representation.<sup>18</sup> Even if one is tempted to explain away the apparent singularity of the sorts of concepts I have discussed, such explanations will prove extremely complicated and will tend to draw on argumentative resources outside the Aesthetic. The more complicated and extraneous these explanations become, the less plausible it is to invoke them in reconstructing Kant’s argument in the MEs. A natural move, at this point, would be to augment the appeal to singularity with a further differentiating factor. And to many commentators, this is precisely the function of Kant’s remarks about the priority of the whole of space over its parts.

Let us turn, then, to the second pair of criteria I identified: atomic versus holistic containment structure. The idea is to supplement the foregoing argument with this one:

- 
- (i) The parts (or marks) of a concept are prior to the concept that contains them.
  - (ii) The parts of our representation of space are posterior to that representation as a whole.
  - (iii) Therefore, our representation of space is not a concept, but an intuition.
- 

Though there are weighty reasons for thinking,<sup>19</sup> as the majority of commentators do, that Kant accepts some version of (i),<sup>20</sup> I would like to explore a line of thought that suggests it is actually incompatible with fundamental features of his views about definition.

In the *Discipline of Pure Reason*, Kant argues that it is impossible to define either empirical or a priori ‘given’ concepts – that is to say, concepts we do not consciously invent but simply find ourselves with.<sup>21</sup> A definition, for Kant, is the clear and complete presentation of a concept’s marks.<sup>22</sup> It is impossible to define concepts we simply find ourselves with, in Kant’s view, because we can never be

sure we have identified all their marks. In the case of given, empirical concepts, this is because 'one employs certain marks only so long as they suffice for making distinctions; new observations remove some [marks] and add others' (A728/B756). Similarly, it is impossible to define given, a priori concepts (such as 'substance, cause, right, equity') because we can never be sure we have not 'passed over [certain obscure representations] in our analysis, though we constantly depend on them in the application [of the concept to be defined]' (A728/B756). In both cases, whether a certain mark belongs to a concept is a function of our use of that concept in judgements (cf. A68/B93).<sup>23</sup> Use, for Kant, is the touchstone of analysis, the criterion of markhood.<sup>24</sup> This suggests that the marks of a concept that we simply find ourselves with (which is, of course, the normal case) are dependent on and hence *posterior* to the concept that contains them.<sup>25</sup> They are posterior to the whole concept in the sense that the identity conditions of the marks depend on the identity of the whole concept, whereas the identity of the whole concept is not determined by its marks, but by something else – namely its competent use in (its cognitive contribution to) potentially knowledgeable judgements and cogent inferences.<sup>26</sup>

So it is not obvious that Kant would accept that the parts of a discursive representation are necessarily prior to the whole that contains them. Moreover, it is not clear how the introductory sections of the *Critique* could possibly support such a view. Thus, even if Kant does treat discursive representations as atomically structured (which I've tried to cast some doubt on), it would be a philosophical weakness of his argument and an interpretive weakness of any reconstruction of his argument to invoke that (disputable) theory in establishing the intuitive status of spatial representation.

That leaves the criteria of mediacy and immediacy. Kant clearly articulates and even seems to argue for these criteria in the Aesthetic (A19/B33), but it is not obvious how they might be combined with Kant's remarks (at A25/B39) to form a sound argument for the intuitive status of our original representation of space. Why, one wonders, should the features of spatial representation Kant highlights (namely essential unity and holistic structure) prevent us from representing space mediately? After all, the MEs are expositions of our discursively mediated *concept* of space. Far from demonstrating the immediacy of our representation of space, the features Kant highlights are themselves marks through which that representation is mediated. Indeed, we must be able to mediately represent anything we can think about at all, for all thought and judgement involves discursive representation. Unless one supplements the mediacy criterion with an account of conceptual representation as general or as atomically structured – which we have seen would be problematic – it is unclear how mediacy might play a pivotal role in Kant's argument.

A more plausible (and, I think, compelling) case can be made for the criterion of intuitive immediacy. This might seem surprising if one takes immediacy merely to mean that a representation refers to its object(s) without thereby referring to any other 'intervening' representations.<sup>27</sup> For then the same question

recurs – why should the essential unity and holistic structure of our representation of something (such as space) entail that that representation relates to its object immediately? I will instead suggest that we view the immediacy criterion as a further (synthetic) specification of Kant's initial and, I would maintain, fundamental characterization of intuition as that (type of) representation through which objects are *given* to us.

## 2. Kant's functional conception of intuition

To bring into view the conception of intuition that is operative in the MEs, one must look to the introductory discussions preceding them. I will suggest that the Introduction to the *Critique* and the opening section of the Aesthetic articulate and vindicate a distinctive conception of the finitude of the human mind – a conception which should be acceptable to rationalists and empiricists alike and which sets the framework for Kant's critical project.<sup>28</sup> In theoretical philosophy, the crucial aspect of our cognitive finitude is that, without experience, we would have no knowledge at all: 'There is absolutely no doubt [gar kein Zweifel] that all our knowledge begins with experience' (B1).<sup>29</sup> This is because, as Kant puts it, the human mind ('das Erkenntnisvermögen') must 'be awakened into action' (B1). That is, even if our cognitive activity (once begun) is spontaneous and self-sustaining, it must still be triggered, occasioned, or otherwise set into motion by something distinct from it. And our knowledgeable cognitive activity is paradigmatically triggered (at least initially) by the objects of which it is knowledgeable. This is all it means to say, at the outset of the *Critique*, that our faculty of intuition is receptive – namely that our capacity to stand in a potentially knowledgeable relation to objects depends on our being given objects that exist independently of our acts of thinking about them.<sup>30</sup> Such object-giving representation is, for us, sensible intuition (A15/B29). The opening of the Aesthetic then further specifies (synthetically enriches) this conception by arguing that such object-giving representations must be immediate. For a discursively mediated representation of an object – one which refers to its object by representing some feature it may share with other objects – applies to indefinitely many possible objects, some of which may not even exist.<sup>31</sup> Thus, because mediate representations cannot guarantee the existence of the objects they represent, all object-giving representations must relate to their object(s) immediately.

This functional conception of sensibility – as that faculty whose (immediate) representations give us objects that exist independently of our thoughts about them – is the only conception Kant has articulated and vindicated by the beginning of the MEs and is, accordingly, the only conception on which they may legitimately trade.<sup>32</sup> Thus, if we can show that the latter MEs depend on precisely this conception of sensibility (and not on notions of conceptual or intuitive representation justified only later on, or not at all), we will have revealed them to be impressively well grounded. Moreover, if we can also show that the MEs

provide the conceptual resources to further enrich this initial conception of intuitive representation, we will have revealed them to be exemplars of the ‘synthetic’ procedure Kant claims to have pursued in the *Critique* (cf. *Prolegomena* §4, 4:274). Our challenge, then, is to explain why our representing something as essentially unitary and holistically structured entails that what is thus represented must be given to us in order for us to represent it at all. The answer, I think, is to be found in Kant’s grounds for attributing essential unity and holistic structure to space in the first place. It is precisely because space is infinite – and, in particular, continuous – that it is essentially unitary and holistically structured. The finitude of the human mind, Kant reasonably maintains, is incapable of accounting for such a holistic, infinitary manifold. To the extent that we can (and do) represent such a manifold, therefore, it must be given to us – i.e. our original representation of it must be intuitive.

Before delving into the details of Kant’s argument, it behooves us to reflect for a moment on the sort of argument the MEs are supposed to embody. Kant writes:

By **exposition** (*expositio*) I mean the distinct (if not complete) representation of that which belongs to a concept; an exposition is **metaphysical** when what it contains exhibits the concept **as given a priori**. (B38)

The argument we are considering is engaged in a particular kind of conceptual analysis – an investigation of the content of a concept, which reveals that concept to have an a priori origin.<sup>33</sup> It is natural to wonder what sorts of considerations may legitimately be invoked in arguing that a concept contains a particular mark. The answer, I think, is that everything – every thinkable content – is fair game. As I argued above, the criterion of markhood is our competent use of concepts in judgements. In analysing a concept, therefore, we may call upon any potentially knowledgeable judgement which competently uses the concept in question. It may be that, for such purposes, false judgements are relatively uninformative or downright misleading, while knowledgeable judgements are most illuminating. But, in principle, it should not matter whether the judgements guiding our analysis are true, false, analytic, synthetic a priori, or empirical, so long as they perspicuously exhibit aspects of the concept’s cognitive contribution to the judgements and inferences in which it figures. This approach undermines a widely held view of Kant’s method in the Aesthetic. Some commentators seem to think that Kant’s strategy of ‘isolating sensibility’ (A22/B36) culminates in something like a phenomenological inspection of our bare, unconceptualized intuitions of space and time (as though there were such things). This misconceives Kant’s self-avowed task. Kant is not engaged in introspective phenomenology or any other attempt to tap into conceptually unadulterated sensible representations: he is engaged in conceptual analysis. And that means he may freely bring to bear the full range of our conceptual apparatus. The goal, of course, is still to show that the *origin* of our representation of space must be intuitive. But this does not mean we must (or can) enjoy such intuitive representations (or have knowledge of them) independent of our conceptual activity, nor that such originally intuitive representations are themselves

unconceptualized. Why should we start by assuming that the MEs run afoul of Kant's famous claim that 'thoughts without content are empty, intuitions without concepts are blind' (A51/B75)?<sup>34</sup>

Kant's strategy in the MEs is thus to exploit our judgements about space in determining what belongs to our concept of it.<sup>35</sup> His argument that our original representation of space must be intuitive will then turn on the claim that some of the features revealed in the course of this investigation – some of the marks of our concept of space – could only have an intuitive source. The marks he highlights are the *essential unity* and *holistic mereological structure* of space, to which we now turn.

### 3. The essential unity and holistic mereological structure of space

Kant offers two considerations in favour of his conclusion, each of which is supposed to capture an essential aspect of our concept of space. First, we can only represent one single space; any plurality of 'spaces' is conceived to constitute only parts of that single space.<sup>36</sup> Second, these spaces cannot be conceived as prior to the whole of all-encompassing space, as though space could be constructed out of them.<sup>37</sup> Rather, any plurality of spaces must be represented as *in one*, essentially unified space. These are related observations. The first says that space is a single whole containing a plurality of parts, while the second clarifies the notions of 'part' and 'whole' at issue. These reflections are then summarized in the remark that '[space] is essentially unitary [einig], the manifold in it [...] rests solely on limitations' (A25/B39). It is at this point that Kant draws his conclusion: 'it follows from this that [...] an intuition a priori [...] must underlie all concepts of [space]' (A25/B39). If, as I have argued, the only conception of intuitive representation available to Kant at this point is the idea of a representation which gives us an object that exists independently of our mental activity, then we can interpret Kant's argument here as claiming that the essential unity and holistic structure of spatial representation shows that space could only be given to us – i.e. that anything we represent as having these characteristics could not be a product of our own discursive mental activity.

There is a fairly straightforward and by no means unprecedented line of thought which might lead Kant to assert this. After all, our faculty of thought is limited in extent and acuity – that is, our thoughts can only ever be finitely complex. That is not to say that we cannot think or know anything about things that are infinitely complex. It is just to say that our thoughts and concepts of those things will not themselves be infinitely complex, i.e. they will not consist of or contain an infinite (much less non-denumerable) manifold of representations: 'no concept, as such, can be thought as containing an infinite collection [Menge] of representations **in itself**' (B39-40).

The products of our spontaneous, discursive, mental activity may be arbitrarily complex, since there is no 'lowest species' and we may accordingly contrive concepts as complex as we please. But there is, for Kant, a 'highest

genus' – namely the concept of (merely) *something* [*Etwas*]. So no concept or thought is infinitely complex, for every concept results from a finite number of specific differentiations of the highest genus.<sup>38</sup> Therefore, if Kant can show that we represent space to be infinitely complex, he will have shown that space (as we represent it to be) could not be a product of our power of thought, and must consequently be given to us in order for us to know or represent it as such.<sup>39</sup> And since sensibility is precisely our capacity to be given what is independent of our mental activity, Kant would thereby have shown that our representation of space (as an infinitely complex manifold) can only have its source in our faculty of sensibility: 'when it comes to space, an intuition a priori underlies all concepts of it' (A25/B39).

That this is indeed the argumentative route Kant favours is strongly suggested by the opening line of the final ME: 'Space is represented as an infinite **given** magnitude' (B39). Yet questions remain about how this claim relates to Kant's explicit observations in the penultimate ME. Emily Carson has argued that the essential unity and holistic character of space are meant to establish that space is infinite in expanse and divisibility:

The boundlessness of space is shown by the fact that any given space, however large, is given as bounded by more of the same. Similarly, particular spaces are given only as limitations of the all-encompassing space. These latter two facts seem to me to underlie Kant's claim that the progression of intuition is limitless . . . in both directions [i.e. outward and inward]. (Carson 1997, 499)

The textual evidence for this aspect of Carson's reading is quite strong.<sup>40</sup> Kant often seems to take the fact that every determinate space is surrounded by still more space to imply that space is infinite in expanse, in the sense that the whole of space is strictly greater than any space that can be determined in it.<sup>41</sup> Similarly, Kant seems to take the fact that all determinate spaces are (or 'rest on') mere limitations of the whole of space to imply its infinite divisibility.<sup>42</sup> However, both these views are philosophically problematic. As Parsons (1998, 53) observes, it can be true that every space is surrounded by still more space even while the whole of space is finite in size – provided that space is dense and that the size difference between each space and the space surrounding it converges to zero as one proceeds further out. Similarly, the idea that determinate spaces rest on limitations of an all-encompassing space only entails the latter's infinite divisibility if one assumes the boundlessness of such phenomenological 'zooming in'. But this assumption is dubious, for we seem to enjoy a finite fineness of phenomenological grain, and this notion of limitation simply begs the question against a sceptic about infinite divisibility. Carson's reading thus saddles Kant (not without textual grounds) with several dubious, unsupported assertions.<sup>43</sup>

One obvious way to support these assertions would be by appeal to certain results of geometry or assumptions of mathematical physics. This would effectively reverse the inference Carson portrays Kant as making. Instead of concluding that space is infinite (in both directions) on account of its essential

unity and holistic mereological structure, Kant would instead be relying on precisely this twofold infinity of space to justify those characterizations of it. There is ample historical precedent for the latter inference. Most notably, Leibniz holds that the infinite – and, in particular, the continuum – is prior to its parts and therefore cannot be ‘composed’ out of parts, since its parts, considered in themselves, are indeterminate. This is because any determination of its parts depends on reference to the whole in the same way that determining a quantity through a fraction (e.g. ‘half of my paycheck’) depends on reference to the whole quantity.<sup>44</sup> Leibniz reasons that anything with infinitely many parts has more parts than can be expressed in a determinate number. Accordingly, there is no one determinate set of parts out of which one can say that such a thing is composed. In the case of the infinitely large, composition is impossible because it cannot come to an end; in the case of the infinitely small, composition is impossible because it cannot find a place to begin, i.e. a basic unit of composition.<sup>45</sup> To maintain that the parts of the spatial continuum are prior to the whole, one must contend either that its ‘parts’ are extended, or that they are unextended. If they are extended, then they too are continua and thus depend on *their* parts, and so on *ad infinitum* – a regress Leibniz and Kant quite reasonably take to be vicious.<sup>46</sup> If, on the other hand, the ‘parts’ of space lack extension, one must explain how points of zero measure can ‘sum’ or ‘aggregate’ to a non-zero magnitude. Kant follows his major interlocutors in denying that this is coherent.<sup>47</sup> But even assuming it is coherent, a natural strategy would be to assign the points Cartesian coordinates (or something analogous).<sup>48</sup> Yet the ability to assign these coordinates presupposes the intelligibility of the coordinate system within which they have their sense. A point (or part) is only identified as the part it is (and as spatial at all) by reference to an antecedently intelligible coordinate system (or whole) within which its location (and, consequently, its identity as a point in space) is determined. And this is precisely to treat the whole (system) as prior to its parts, contrary to the hypothesis.

Thus, we might read Kant’s remarks about the essential unity and holistic structure of space – the fact that all spaces are located in a single, all-encompassing space of which they are limitations – as reminding the reader that we think of space as an open-ended continuum, i.e. as a reminder that this is part of what one means ‘when one speaks of many spaces’ (A25/B39). This meaning becomes explicit in judgements that are available to us from geometry, mathematical physics and our ordinary beliefs about the possibility of enduring, continuous motion.<sup>49</sup> And insofar as these judgements competently deploy the concept of space, we may legitimately rely on them in identifying the marks of that concept.

It is not my primary concern here to decide whether Kant argues for the twofold infinitary structure of space on the basis of its essential unity and holistic articulation or the reverse. The point I wish to insist on is simply that the intuitive status of spatial representation – the fact that space must be given to us in order for us to represent it at all – turns on our representation of the spatial manifold as

infinitely complex.<sup>50</sup> Because this infinite complexity cannot be a product of our discursive mental activity, whose representations are always finite, our representations of it must originate in intuition.<sup>51</sup>

This line of thought might seem suspect, however. After all, intuitive representations belong to our finite minds, too; so why should an *intuition* be capable of containing an infinite manifold if a *concept* is not? Here, it is helpful to recall the conception of sensible representation with which Kant is operating. To say that a representation is sensible is just to say that it involves features that discursive thought cannot give rise to. It is not to say that intuition can *represent* things thought cannot (something Kant would surely deny!). Anyway, Kant not only acknowledges, but *insists* that the whole of infinitely complex space is not (and cannot be) an object of intuitive representation:

The mere form of intuition, without substance, is not in itself an object [Gegenstand], but merely the formal condition of one (as appearance), just as pure space and pure time are admittedly something, as forms of intuiting [Formen anzuschauen], but are not themselves objects that *get* intuited [Gegenstände die angeschauet werden] (*ens imaginarium*). (A291/B347, my italics)<sup>52</sup>

Infinitely complex space is a condition of the possibility of experience; it is not (and need not be) an *object* of possible experience, for no intellectual synthesis is capable of comprehending it.<sup>53</sup> Spatial representation is intuitive because its content must be given to us – a fact which is quite independent of whether we can become fully conscious of that content by framing space itself as an object of intuition. We must not hold Kant's critical conception of sensible intuition hostage to notions of perception or phenomenological discrimination. These are surely paradigm cases of intuition for Kant. But that is only because they fit his functional characterization of sensibility: they are cases in which something independent of our discursive thought is given to us. A striking consequence of Kant's functional conception of sensibility is that we can and do represent in intuition contents we could never perceptually discriminate or become explicitly conscious of. Whether something fulfils the criterion of giving us an object is determined not through phenomenological investigation, but conceptual analysis. The MEs attempt to determine the primary marks of our concept of space based on what we think (judge, know) about space. Even without endorsing these (mathematical, physical, ordinary) conceptions of space as knowledgeable, we can ask: how are these contents so much as available to thought? Kant's aim is to identify the conditions under which certain kinds of human knowledge are possible, to spell out the cognitive abilities any finite human knower must possess. He is not concerned (in the *Critique*, anyway) to explain how such capacities are realized *in concreto* in the human animal, nor to characterize what it is like, as it were, 'from the inside' to exercise such capacities. It simply does not matter whether we can become phenomenologically aware of every aspect of what we attribute to intuition. Kant's notion of intuition is purely functional: whatever cannot originate in thought but must be given to it is, *ipso facto*, represented in intuition (if it is represented at all). It is this functional account of our cognitive finitude that underlies Kant's

heterodox view that the mathematically infinite both *can* be represented sensibly and *can only* be so represented. And it is this account that enables him to argue (to the consternation of opponents and proponents alike) that the ‘coarseness [of the senses] doesn’t at all concern [überhaupt nicht angeht] the form of possible experience’ (A226/B273).<sup>54</sup> To claim that spatial representation is ultimately sensible is merely to register that we conceive of space as an unbounded continuum and that our discursive mental activity cannot account for such holistic, infinite complexity. This does not mean we have (or are able to have) some quasi-perceptual acquaintance with infinitely complex space. It only requires us to acknowledge our cognitive finitude in accounting for our concept of an infinite spatial continuum.

#### 4. The singularity of intuition – a step in Kant’s synthetic argument

I will close by briefly indicating how this interpretation enables us to construct an argument for the singularity of intuitive representation. This serves to partly confirm Kant’s claim to have proceeded ‘synthetically’ in the *Critique*, and it helps to illustrate how protracted and meticulous his elaboration and defence of the critical notions of understanding and sensibility truly are. The initial conception of intuition with which Kant begins is what one might call ‘cognitive access’ – namely a knowledge enabling cognitive relation to an object. He then argues, fairly trivially, that our mode of intuition is receptive – i.e. that the objects that are given to us, the objects to which we have cognitive access, exist independently of our acts of thinking about them.<sup>55</sup> An initial synthetic step comes in the opening of the Aesthetic (A19/B33), which argues that only immediate representations can give us objects that exist independently of our thought (since mediate representations apply equally well to possible, though non-existent, objects). We thereby enrich the notion of an *object-giving* representation by including the idea of *immediacy*. The two quartets of the MEs then purport to establish that space and time are a priori *forms* of intuition. But since the MEs reveal the intuitive roots of spatiotemporal representation without appealing to the singularity of intuition, Kant can subsequently invoke the singularity (and unique coordination) of space and time to argue that all intuitive representation is *singular*. Since the form of our intuition is essentially (spatio-)temporal, all intuitions represent determinate portions of (space-)time.<sup>56</sup> And since we represent spacetime as essentially unitary and as mereologically articulated, we necessarily represent it and all its ‘parts’ as particulars.<sup>57</sup> It follows that all our intuitions essentially represent unique parts of a mereologically structured and holistically articulated unity. They are, that is, essentially singular representations. This is a further enlargement of our concept of intuition as *object-giving, immediate, singular representation*. The lynchpin of this argument is our concept of spacetime as a holistic, infinitary structure. For this simultaneously supports the claims that (i) spacetime is represented as essentially unitary and (ii) spatiotemporal representation is ultimately intuitive.

What I have tried to argue here is that it is, in part, this surprising connection between infinity and givenness which distinguishes Kant's critical conception of sensibility as unprecedented and ingenious.

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### Notes

1. All translations are my own, though I have consulted the standard editions. Kant's emphases are in bold, my own are in italics and noted parenthetically. References to the *Critique of Pure Reason* refer to the 1781 (A) and 1787 (B) edition pagination. References to Kant's other writings cite the volume and page number of the Akademieausgabe of *Kants Gesammelte Schriften* and are preceded by an abbreviated title of the cited work. I abbreviate the titles of Kant's works as follows: *Physical Monadology* (= *The Employment in Natural Philosophy of Metaphysics Combined with Geometry, of which Sample 1 Contains the Physical Monadology*); *Only Argument* (= *The Only Possible Argument in Support of a Demonstration of the Existence of God*); *Inquiry* (= *Inquiry Concerning the Distinctness of the Principles of Natural Theology and Morality*); *De Mundi* (= *On the Form and Principles of the Sensible and the Intelligible World*); *Critique* (= *Critique of Pure Reason*); *Prolegomena* (= *Prolegomena to Any Future Metaphysics that Will Be Able to Come Forward as Science*); *Groundwork* (= *Groundwork of the Metaphysics of Morals*); *Discovery* (= *On a Discovery According to which Any New Critique of Pure Reason is to be made Superfluous by an Older One*); *Prominent Tone* (= *On a Recently Prominent Tone of Superiority in Philosophy*); *Logic* (= *Jäsche Logic*); *DW-Logic* (= *Dohna-Wundlacken Logic*); *Kästner* (= *Über Kästners Abhandlungen*). Reflections are preceded by an 'R' and include Adickes's estimate of their date, where applicable.
2. This impression is perhaps encouraged by the fact that the sensibility/understanding distinction is first presented 'by way of introduction' as a 'preliminary reminder [Vorerinnerung]' (A15/B29). The opening claims of the Transcendental Logic are liable to reinforce this impression, because it is hardly any easier to find an explicit, non-question-begging argument for the details of Kant's concept/intuition distinction in the vicinity of his much celebrated declaration that 'thoughts without content are empty, intuitions without concepts are blind' (A51/B75; cf. A271/B327).
3. I will refer to the numbered sections of the Metaphysical Exposition of the Concept of Space in the B edition simply as the 'MEs'. There are significant similarities between these and the corresponding discussions of the concept of time, so much of what I say about the one will apply *mutatis mutandis* to the other. But the two are sufficiently different to warrant separate treatments.
4. My guiding assumption throughout is that Kant's claims pertain to our *representation* of space – i.e. to space as we *represent it to be*. Without this implicit qualification, the question whether 'space is [...] a discursive [...] concept' already presupposes that space itself is a mere representation (and, hence, ideal), which is rather supposed to be one of the 'Conclusions from the Above Concepts' (A26/B42). The MEs are expressly concerned with our *concept* of space –

i.e. with space as we conceive of it. Their task is to provide a ‘clear (if not complete) representation of what belongs to [this] concept’ (B38; see Section 2).

5. The chart provides only the roughest glosses on these notions, and it would be hasty to attribute them, as stated, either to Kant or to any particular commentator’s account of his views. They are meant only to indicate some directions in which precise criteria for intuitive and conceptual representation might be sought. My discussion aims to accommodate differences of opinion about how these criteria are to be spelled out and about how they interrelate. With one exception – namely the purportedly atomic containment structure of conceptual representation, discussed below – I do not dispute that the listed features are criterial for intuitive and conceptual representation. What I dispute is that these criteria may be legitimately invoked to generate a cogent reconstruction of the argument in question.
6. A smattering of examples should suffice to confirm this. Vaihinger treats the concept/intuition distinction as exclusive and invokes singularity as a necessary and sufficient criterion of intuition (1892, 211f., 223; citing *De Mundi* and the *Nachlass*), generality as a sufficient condition of concepts (211f.; citing the *Nachlass*) and atomic containment structure as a sufficient condition of concepts (219; citing the *Logic*). Kemp Smith (1923, 105, 107) treats the distinction as exclusive and exhaustive and invokes singularity and immediacy as severally necessary and sufficient conditions of intuition, and then generality, mediacy and atomic containment structure as severally sufficient conditions of concepts. Paton (1936, I:115) presupposes the exclusivity of the distinction and invokes generality as a sufficient condition of concepts (citing the *Logic*) and declares singularity a sufficient condition of intuitions. Ewing (1950, 37) invokes singularity as a sufficient condition of intuition and atomic containment structure as a necessary condition of concepts. Strawson (1966, 64) claims that the distinction is exclusive and exhaustive and invokes singularity as a necessary and sufficient criterion of intuitions and generality as a necessary condition of concepts. Parsons (1992, 63, 69f., 1998, 46) invokes singularity and immediacy as severally sufficient conditions of intuition (citing the *Stufenleiter* at A320/B376f., the *Logic* and the *Aesthetic*). Pippin (1982, 64ff.) invokes singularity and immediacy as severally necessary and sufficient conditions of intuition (citing the *Stufenleiter* and B136n.). Allison (1983, 90, 2004, 109) presents the argument as consisting of ‘two steps’, the first of which presupposes the exhaustiveness of the concept/intuition distinction and invokes singularity as a sufficient condition of intuition. The second step Allison identifies (1983, 91, 2004, 110) presupposes the exclusiveness of the concept/intuition distinction and invokes atomic containment as a sufficient criterion of conceptual representation. Guyer (1987, 346, 348) invokes singularity as a necessary and sufficient condition of intuition. Falkenstein (1995, 218) invokes singularity as part of the ‘definition’ of intuition and thus, presumably, as at least a necessary condition for intuition (citing *De Mundi*, *Logic* and *Discovery*). Falkenstein (1995, 230, 234f.) also describes atomic containment structure as a necessary condition of concepts (oddly citing Kant’s conception of substance (not any theory of concepts) in the *Physical Monadology* and *De Mundi*). Carson (1997, 494, 496, 498) implicitly invokes singularity as a sufficient criterion of intuition and atomic containment structure as a necessary condition of conceptual representation, thereby following Allison in presenting two distinct argumentative routes to the desired conclusion. Gardner (1999, 78) invokes singularity and immediacy as severally sufficient conditions of intuition. Rosenberg (2005, 66) invokes only the mediacy or discursivity of concepts. Buroker (2006, 52) invokes generality as a necessary condition of conceptual representation. Shabel (2010, 100, 102) invokes only singularity as a sufficient condition of intuition, implicitly treating the concept/intuition distinction as exclusive.

7. Kant is often interpreted as asserting that there is (necessarily) exactly one space – a claim some challenge by arguing that the idea of wholly dissociated spaces is coherent (cf. Quentin 1962; Hollis 1967). The basic worry is that Kant commits a fallacious quantifier inversion. The fact that every space is part of some greater space does not entail that there is an all-encompassing space of which every space is part. But the weaker point may suffice for Kant's purposes because he is ultimately concerned with space as the framework of *our* outer experience. The unity of space, then, is a function of the unity of experience (cf. B136n., B138, B144n, B160, B161n.). The point is that it is part of our concept of experiential space that it cannot be fragmentary and that anything we might possibly experience as outer must be located within it. Falkenstein (1995, 219) accordingly interprets Kant as claiming only that space (and anything in it) is a particular, but not that it is unique. In any case, a possible plurality of spaces only seems to threaten Kant's position if one takes his argument to turn on the singularity of intuition, and it is my present task to expose the flaws of this interpretation. Section 2 gives an account of intuition that does not presuppose singularity. Section 4 then indicates how the singularity of intuition can be viewed as a consequence of Kant's argument.
8. Guyer and Wood translate 'einig' as 'single'. Now 'einig' can indeed mean *single* or *solitary*, as in Luther's translation of Genesis 22.2: 'nim Isaac deinen einigen son' ['take Isaac, your only son']. But it can also signify unity or undividedness, as in Kant's claim that the necessary being 'is unified [einig] in its essence, simple [einfach] in its substance' (*Only Argument* 2:89). Indeed, in its primary colloquial sense, 'einig' is used (and was used at the time) to signify agreement or solidarity (i.e. unity) among various parties, and this is the sense that most frequently appears in Kant's writings. Kemp Smith preserves the ambiguity between these senses of 'einig' by translating it as 'one' or eliding it altogether. Though I take 'einig' here to mean *unified*, I have opted for 'unitary' in order to preserve the ambiguity of the original and to avoid begging any questions. If Kant had used 'einzig' rather than 'einig', 'single' would be apt. Since he did not, a neutral translation seems preferable. See the entry for 'einig' in the Grimm Wörterbuch, from which the above examples are drawn.
9. See, for example, Kemp Smith (1923, 107), Allison (1983, 90–91, 2004, 109–110), Parsons (1992, 70) and Falkenstein (1995, 67–69). Vaihinger mentions, but does not evaluate this objection, attributing it to Riehl, while also citing Trendelenburg (1892, 213). Commentators typically cite singular ideas of reason as potential counter-examples – e.g. < the world > , < nature > or < God > . But the full force of this objection only becomes clear when one considers the wide range of ostensibly singular concepts Kant's system allows, as I do below.
10. I follow the common practice of using chevrons around words to mention the concepts they signify: thus, < Pferd > and < horse > denote the same concept, viz. the concept of the natural species *equus ferus*.
11. For a compelling account of why this should be so, see Anderson (2004).
12. E.g. B15 (twice), B16 and *Prolegomena* 4:268.
13. One might think the singularity of such mathematical concepts can be explained by invoking construction in intuition and the singularity of intuition. There is surely something right about this, but it does not advance our understanding of A25/B39. A first difficulty with the proposal is that some mathematical concepts admit of multiple references: e.g.  $\sqrt{4}$  refers both to 2 and to -2. Kant implies that square roots have multiple solutions in *Negative Magnitudes* (2:173) in arguing that combining negative magnitudes is a case of addition rather than subtraction (i.e. that -2 and -2 yield -4). Because the product of -2 and 2 is just the sum of -2 and -2 (i.e. -4), the product of -2 and -2 should have the opposite sign, i.e. = 4 (cf.

Euler 1911, *Vollständige Anleitung zur Algebra*, §33). Thus, 2 and  $-2$  are referents of  $\langle \sqrt{4} \rangle$ . Kästner (1758) also argues that the product of two negative numbers is positive in §105 of his *Anfangsgründe der Arithmetik*, which Kant mentions approvingly in *Negative Magnitudes* (2:170). Moreover, the solution of physical problems involving scalar quantities will require that we allow the products of negative magnitudes to be positive. Multiply referential mathematical concepts show that construction in intuition does not ensure singularity in the sense of reference to exactly one object (unless we construe the referent of  $\langle \sqrt{4} \rangle$  as a set or an unordered pair, which seems unjustifiably anachronistic). Moreover, this plurality of reference seems to result from the relevant mathematical operation, not from its construction in intuition, which supports my contention that singular mathematical concepts owe their singularity to the content of the mathematical functions they invoke (and not to their having been put to a singular use). A second difficulty with the proposal is that the theory of mathematical construction in intuition (along with the singularity of intuition itself, I would argue) is something the Aesthetic is supposed to help establish, not something it can take for granted as a premise. So, one cannot appeal to this theory in order to defuse counterexamples to a proposed reconstruction of Kant's argument in the MEs. It is more natural to suppose that the order of argumentation in the *Critique* is precisely the reverse: geometrical concepts, for example, must be constructed in intuition *precisely because* space is the form of outer sense and geometry is the pure science of space. Finally, even if Kant were entitled to invoke this theory of mathematical construction in establishing the originally intuitive status of spatial representation, the role of construction in mathematics no more undermines the genuinely discursive nature of mathematical concepts than the originally intuitive status of spatial representation undermines the discursive character of the concept  $\langle \text{space} \rangle$ . So we would still be lacking an account of singularity on which *only* intuitions are singular and/or an account of generality such that *all* concepts are general, which is what the mooted reconstruction of the argument calls for.

14. Recall that Kant explicitly argues that the concept of the most real being is singular in *Only Argument* (2:83f.).
15. It should be obvious that the singular purport of  $\langle \textit{entis realissimi} \rangle$  cannot be borrowed from intuition, because it is 'a concept which we can never exhibit in concreto in accordance with its totality' (A573/B601).
16. The idea that  $\langle \text{totality} \rangle$  can itself constitute a mark (*Merkmal*) of more specific concepts not only affords us a procedure for generating essentially singular discursive representations consistent with Kant's theory of concepts, but it also suggests a way of reconciling these peculiar representations with Kant's claims that concepts are intrinsically general (e.g. *Logic*, 9:91). Although many concepts which contain  $\langle \text{totality} \rangle$  as a mark are, for that reason, essentially singular,  $\langle \text{totality} \rangle$  is not *itself* a singular representation. (There are, after all, innumerable many totalities.) This ought to remind us that individual marks are essentially general, for they are precisely 'that which is common to *many* objects' (*Logic*, 9:58, my italics, cf. A320/B377). Marks very often impart their generality to the discursive representations mediated through them. But as we have observed, one can generate a singular discursive representation either by including a mark like  $\langle \text{totality} \rangle$  in its intension, or by combining other marks in such a way that it is (logically, metaphysically, or mathematically) impossible for more than one object to exhibit those marks. Because all concepts (as discursive) are mediated through marks, one can see the sense in insisting that even  $\langle \textit{ens realissimum} \rangle$  is an 'intrinsically [*an sich*] general concept' despite its being 'the representation of an individual' (A576/B604). Moreover, this explains why the *Stufenleiter* does not actually characterize

concepts as 'general' but instead says that they are 'mediated by means of a mark that can be common to many things' (A320/B377). It also sheds light on Kant's remark that '[t]he generality or general validity of the concept does not rest on the fact that it is a partial-concept [Theilbegriff], but on the fact that it is a ground of cognition' (*Logic*, 9:95). If it is impossible for a certain concept to serve as the ground of cognition of more than a single thing, that concept is essentially (though not intrinsically) singular, notwithstanding its discursive mediation through general *Merkmale*. What a certain concept can enable us to cognize is precisely the sort of consideration from which we abstract in pure, general logic (cf. A58/B83; *Logic* 9:13). Within the context of such an investigation, then, it makes sense to treat all discursive representations as (tautologically) general. Once we are concerned with the conditions of the possibility of knowledge of *objects* (e.g. in the *Critique*), such abstractions are illegitimate and we must ask of every discursive representation *whether* and *of how many* objects it can serve as a ground of cognition. Sometimes, we can answer both questions (e.g. in the case of  $\langle \text{sum of 7 and 5} \rangle$ , or  $\langle \text{largest integer} \rangle$ ). Other times, we can answer one but not the other. We may demonstrate that, if *anything* can be cognized through the concept in question (e.g.  $\langle \text{complete series of causes} \rangle$ ), only *one* thing can be cognized through it, even though the objective validity of the concept as a ground of cognition must remain forever problematic for human reason. The crucial point is that, in the context of a critique of our ability to know objects, the discursivity of a representation is not a matter of its generality, but a matter of its mediation through marks and its consequent inability to *give us* the object(s) it represents. It is, I shall suggest, precisely this feature that fundamentally distinguishes concepts from intuitions.

17. The link between the forms (and functions) of judgement and the categories that is supposed to be established in the Metaphysical Deduction clearly involves some reference to intuition in general: '[The categories] are concepts of an object in general, through which the intuition of that object is regarded as **determined** with respect to one of the **logical functions** to judge' (B128). This might tempt one to yet again (see note 13) attempt to explain away the singular purport of such totality-concepts by invoking their connection to intuition (and the singularity of intuition). There is surely something right about this, but the strategy faces a number of complications. First, the category  $\langle \text{totality} \rangle$  remains a discursive representation that originates in the understanding alone (cf. A137/B176, B377; *Prolegomena* 4:330; *Logic* 9:92), so totality-concepts still seem to provide examples of essentially singular discursive content, even if that content bears some intrinsic link to intuition. Second, the strategy does not neatly apply to a number of totality-concepts (such as  $\langle \text{ens realissimum} \rangle$ ), which cannot, in principle, be exhibited in intuition and which, therefore, cannot derive their singular purport from intuition in any straightforward manner. Finally, it is interpretively suspect to draw on the results of the Metaphysical Deduction (and, one suspects, the notion of figurative synthesis from the Transcendental Deduction) in reconstructing Kant's argument in the MEs. Even if it is possible to explain away the ostensible singularity of totality-concepts (and their kin) by exploiting argumentative resources found elsewhere in Kant's corpus, it strains credulity to claim that these argumentative resources are available at the outset of the Aesthetic. So while it may be possible to resolve the apparent tension between such singular discursive representations and Kant's claims that concepts are intrinsically general (perhaps along the lines I suggest in note 16), it is illegitimate to employ such an account in reconstructing Kant's argument at A25/B39.
18. It is worth noting that Kant nowhere characterizes intuitions as *singular* in the text leading up to the MEs. He says that intuitions alone *give us* objects (A16/B29, A19/B33), he says they relate *immediately* to the objects they give us (A19/B33), and he

says that they contain a *manifold* and have a hylomorphic structure (A20/B34). But *singularity* does not figure in the characterizations of intuitive representation that open the *Critique*. Allison (1983, 2004) points to Kant's parallel discussion of time to justify invoking the singularity of intuition in reconstructing Kant's argument. There, Kant says that 'the representation which can only be given through a single object [einen einzigen Gegenstand] is intuition' (A32/B47). But this does not state that intuitions alone are singular representations. What it literally says is that intuitions are the only representations that can *solely* arise through isolated affections by objects. Whether or not concepts *can* arise through affection by a single object (and it is doubtful that they can), it is clear that they *also* (and paradigmatically) arise when we reflect on what many objects (which we have compared) have in common, and when we abstract from certain of their features to common ones (perhaps while recombining these with others; cf. *Logic*, 9:95). Thus, it is not true that concepts can *only* arise through cognitive contact with a single object. This is at once what enables concepts to represent objects and their properties in the absence of those objects and what disables them from guaranteeing (on their own) the objective validity of what they represent. It is because of this discursivity or mediacy that concepts cannot give us objects. (Cf. note 16 above.) Given the exhaustiveness of the concept/intuition distinction, this means that intuitions are the only representations that can *only* arise through affection, which is just what A32/B47 says. It thus recapitulates the opening sentences of the Aesthetic, which connect the idea that intuitions give us objects with the idea that intuitions arise through affection: 'The latter [sc. intuition] only takes place [findet nur statt], insofar as the object is given to us; and this, in turn, is only possible, for us humans at least, if it [sc. the object] affects the mind in a certain way'. (A19/B33)

In Section 4, I will argue that the singularity of intuition is not mentioned before the MEs precisely because it is a *consequence* of them: since all intuition is spatiotemporal and since spacetime is a unique, unitary structure, all intuition is singular, for it represents unique portions of that structure, as such.

19. For example, in the first edition version of the final MEs concerning time, Kant writes: 'But where the parts themselves and every magnitude of an object can only be determinately represented through limitations, there the entire representation cannot be given through concepts (*for there [sc. in concepts] the partial representations are prior*)' (A32, my italics). However, Kant changes this parenthetical phrase in the second edition to read '(for they [sc. concepts] contain only partial representations)'. This change reflects Kant's more substantial revision of the corresponding argument about space in light of his realization that the concept/intuition distinction does not turn on the *priority* of part versus whole, but on the kind of *relation* that obtains between contained and container. See note 50 for my reading of the final MEs.
20. Readers may also have misgivings about (ii), inasmuch as the text of A25/B39 seems to speak not about our *representation* of space and its parts, but about the parts of space itself. But see note 4 and Section 2.
21. The sense in which concepts may be 'given' differs from the sense in which objects may be given (in intuition). With respect to objects, the contrast is between being *given* and being (merely) *thought*. Here, the contrast is between *conceptus dati*, which are given, and *conceptus factitii*, which are made or fabricated (cf. A730/B758; *Logic* 9:93; Vienna *Logic* 24:913–918). Fabricated concepts are 'willkürlich' or 'arbitrary' in that their marks are determined by our elective choice (*arbitrium*). They accordingly have an atomic containment structure: their parts (marks) are prior to the whole. But not all concepts are fabricated and concept fabrication presupposes our possession of 'given' concepts, which, I argue above, are not atomically, but holistically articulated. Paradigmatic fabricated concepts are those of mathematics and the technical concepts of natural science. The former can be defined, in Kant's

- ambitious sense, for they are generated through the construction of their objects in pure intuition, and we can therefore secure their objective validity a priori (cf. A730-2/B758-60; *Logic* 9:63f.). A non-mathematical, fabricated concept cannot be defined because merely combining given marks does not indicate 'whether [the fabricated concept] has an object' (A729/B757). It will have the logical form of a concept but may, for all that, '[have] no meaning [Sinn] and [be] completely devoid of content' (A239/B298). A would-be definition of such a concept is thus a 'declaration (of my project)' (A729/B757) of demonstrating its application to objects of experience – namely by 'compel[ing] nature to answer [my] questions' (B xiii; cf. *Logic* 9:36f.). This is the project of natural science, which extends our knowledge of the phenomenal world even as it secures the meaningfulness of our fabricated concepts.
22. Cf. A727/B755; *Logic* 9:140–145.
  23. For example, by noting the contradiction involved in thinking of a thoroughly permeable material body, we can establish that < impenetrable > is a mark of the concept < body > . For if something is completely permeable, it cannot properly be said to *occupy* a given space, because its 'presence' in no way prevents anything else from occupying that space. But every material body must occupy a space. Thus, by reflecting on competent, non-trivial uses of concepts in judgements and by drawing on our comparatively primitive ability to recognize contradictions, valid inferences, and so forth, we can establish that certain marks are necessary criteria of a given concept's application. Yet we cannot, by this means, establish what marks are *sufficient* criteria for a given concept's application. And that is why given concepts cannot be defined.
  24. Kant's emphasis on the standing possibility of human ignorance and error in identifying concepts' marks might prompt the objection that use (in judgements) concerns only the *ratio cognoscendi*, not the *ratio essendi* of concepts' marks – i.e. how we come to *know* a concept's marks but not what it is to *be* a mark of a concept. Yet such fallibility does not suggest that there is some standard for the content of concepts *apart* from their knowledgeable use. Granted, we can be no more certain of the marks of our concepts than we can be certain that our apparently virtuous motives are not surreptitiously corrupted by self-love (cf. *Groundwork* 4:407). Yet, in neither case does pervasive uncertainty vitiate the fundamentally *self-conscious* nature of the representation or the internality of the standard against which it is measured. Just as a good will is an expression of reason's self-knowledge, so too is the full content of a concept an expression of the understanding's self-understanding – i.e. its knowledge of its own activity in applying concepts in potentially knowledgeable judgements. Despite the fallibility of our efforts at self-knowledge (e.g. through analysis of our concepts), our use of concepts in knowledgeable judgements is constitutive of their meaning precisely because their meaning consists in the contribution they are capable of making to our knowledge. Since knowledge is essentially self-conscious (epistemic hiccups notwithstanding), for concepts, *esse is concipi*.
  25. This comports well with Kant's emphasis that a mark is not only a 'Partialvorstellung' but a 'partial-representation *insofar as* it is considered [a] ground of cognition *of the whole representation*' (*Logic* 9:58, my italics). The cognitive contribution of the (whole) concept is the standard against which a mark's membership in its intension is determined. Cf. also *Logic*, 9:35f., 58f., 64, 95, 96, 145; *Critique* B39f., A69/B94, B133f.n., A728/B756; *Discovery* 8:199; *Prominent Tone* 8:399.
  26. That the marks of a concept are posterior to and dependent on the whole of that concept is thus the complement of Kant's view that concepts are essentially 'predicates of possible judgments' (A68/B93).
  27. Longuenesse (1998, 24n.13) seems to understand the immediacy criterion in this sense. Parsons (1992) advances an alternative conception of immediacy as

- 'phenomenological presence to the mind' (66). I prefer to reserve the term 'immediacy' for non-mediation through discursive marks, but I do think Parsons's account gets closer to the *nervus probandi* of Kant's reasoning here. For, as I will argue, Kant's conclusion does turn on a sort of cognitive presence to the mind – albeit one that should not be construed phenomenologically.
28. I argue for this in detail in Chapter 3 of my dissertation (Smyth, n.d.), which is indebted to Engstrom 2006. I go beyond his account in locating a sound argument for Kant's conception of our cognitive finitude in the opening passages of the *Critique*, as befits Kant's 'synthetic' method (cf. *Prolegomena* 4:274 and note 35).
  29. The A edition Introduction opens with the same thought, though it is already entangled with a particular picture of the dependence of human knowledge on experience, which Kant excises from the B edition: 'Experience is, without doubt, the first product which our understanding produces, in working up the raw material [Stoff] of sense impressions' (A1).
  30. For an intuitive intellect, however, the faculty of thought is also a faculty of intuition. There is an intuitive moment in all theoretical knowledge (finite or infinite), because all knowledge, for Kant, relates to objects. Rosenkoetter ([unpublished manuscript](#)) fruitfully suggests that Kant takes knowledge to be of objects (rather than states of affairs, say) in order to explain the meaningfulness of false propositions.
  31. See A19/B33 and notes 16 and 18, above.
  32. This suggests an analogous functional characterization of the understanding as that faculty which secures the aspects of our knowledge which could not possibly be given to us. The Transcendental Analytic initiates a (synthetic) transition from a 'merely negative' conception of the understanding as a 'non-sensible cognitive faculty' (A67/B92) to a richer, positive conception of the understanding as a spontaneous capacity. This synthetic enrichment of our conception of the understanding begins by noting features of our knowledge that our passive sensibility cannot account for, e.g. combination in general (cf. B129).
  33. For a refreshingly detailed account of Kant's conception of exposition as analysis, see Messina ([forthcoming](#)).
  34. Falkenstein (1995) rightly emphasizes that the MEs should be read in light of Kant's 'blindness thesis'. This corrects a widespread misconception that the Aesthetic presupposes cognitive access to unconceptualized intuitions, which the Analytic denies is possible. Yet while he insists that unconceptualized intuitions are 'for us as good as nothing' (A111), Falkenstein still thinks Kant implies the existence of such intuitions. Kant does hold that we can 'isolate' (A22/B36) sensibility's distinctive contribution to cognition by abstracting from cognitive features due to discursive thought, once 'extended practice has made us attentive to [them] and skilled in separating [them] out' (B1f.). But such notional separability need not imply that these aspects can exist or be conceived on their own. Nor do I see what explanatory role such nugatory intuitions could play in Kant's transcendental epistemology and hence why we should read him as committed to their existence.
  35. Carson (1997, 495) objects that these judgements cannot include the claims of geometry, for that would '[go] against Kant's explicit assertion in the *Prolegomena* that in the *Critique*, he is pursuing the "synthetic method" which is "based on no data except reason itself"' [4:274]. I agree that Kant cannot legitimately appeal here to geometrical principles as objectively valid cognitions we can endorse as true, but I do think he can appeal to them as merely thinkable contents. Such thinkable content provides a sufficient basis for the 'clear (if incomplete)' analyses that make up the Metaphysical and Transcendental Expositions (B52). These analyses nevertheless contribute to a 'synthetic' argument, i.e. one that progresses from relatively simple principles to relatively complex ones and their consequences (*Logic* 9:149; *DW-*

*Logic* 24:779; R3831 (from 1769) 17:353; cf. also R3343 (c. 1772-5) 16:789, and §422 of Meier's 1752, *Auszug aus der Vernunftlehre*). For example, as I suggest below, the marks identified in the MEs enable us to conclude that intuitions are not only immediate and object-giving, but also *singular* representations. Or we can infer any of the notorious claims Kant makes in the section 'Conclusions from the Above Concepts', e.g. that space does not represent any property of things in themselves (A26/B42). Each of these inferences constitutes a synthetic step in that it enriches the principles we began with (e.g. our concept of intuition, or our concept of space). Yet insofar as they depend solely on analyses of concepts (i.e. contents treated as merely thinkable), they do not 'rest upon any fact' (4:274). This is how I interpret Kant's claim that, in philosophy, 'we can conclude various things from a few marks drawn from an incomplete analysis [i.e. an exposition] before we arrive at the complete exposition, i.e. the definition' (A730/B758; cf. *Logic* 9:145). Even while progressing synthetically with the 'assured gait of science', there are moments of analysis and exposition when one foot is planted, enabling the next step forward.

36. Hopefully, this mention of singularity no longer tempts us to short-circuit the argument at this point. Recall that intuitions have not yet been characterized as singular and that many discursive representations are essentially singular. See notes 7 and 18.
37. The priority here is obviously not supposed to be temporal, for all parts of space are simultaneous (B40). Nor is it likely that the priority in question is 'ontological dependence', for Kant emphatically rejects the Newtonians' reification of space: space is not a 'thing', not an 'object' or a 'substance' (see, e.g. A39/B56; A291/B374). Despite his own idealism about space, Leibniz makes the same mistake as the Newtonians in applying the principles of a substance ontology to space – e.g. in claiming that the parts of a continuum depend on the whole of it as the modes of a substance depend on that substance (cf. Leibniz 1923, A6.3:502, 520, and 553). Kant rather seems to hold that the part-whole dependence relation in continua pertains to the sortal-identity of the parts – to *what* they are, not merely *that* they are. It is in virtue of being (represented as) situated within the whole of space that its parts are (represented as) *spatial* in the first place. I think this is why Kant expresses himself by saying that the parts of space 'can only be *thought* as **in it**' (A25/B39, my italics), rather than by saying that they can only *exist* as in it. Nor is his point simply that the numerical identity or difference of distinct spaces is secured by their co-membership in one unitary space (per Melnick 1973, 9). Questions of numerical identity can only arise once the elements in question have been identified as homogeneous – e.g. once the 'parts' of space are identified as *spaces* (as *spatial*). It is a subsidiary point that spatial disjointness (at a given time) suffices for the numerical distinctness of spaces and spatial objects, as such: the question of *what* they are is prior to the question of *which* they are or *whether* they are.
38. Cf. A290/B346, A659/B687; *Logic* 9:59, 146. See also Kant's notes on *Logic* 24:755 (cited by Carson 1997) and the *Vienna Logic* (24:912). For a helpful discussion of Kant's conception of specific differentiation, see Anderson (2004, 507–14).
39. This line of thought bears some structural similarity to Descartes's so-called 'causal' argument for the existence of an infinite being (namely God) in the third *Meditation* (see Descartes 1964–1974, AT 7:40ff.). Descartes maintains that (i) we have an idea of an infinite being (i.e. God), (ii) we could not have derived this idea from anything but an infinite being and (iii) because we know ourselves to be finite beings, we cannot have derived the idea from ourselves, therefore, (iv) there must be an infinite being (God), which is distinct from us, from which we have derived this idea. Accordingly, Descartes and Kant face structurally similar objections. Yet while it is plausible for Descartes's critics to argue (against (i)) that we do *not* in fact have a

genuine or adequate idea of an infinite being, and (against (ii)) that an idea of an infinite being *can* be derived from our ideas of finite beings, these challenges lose much of their force against Kant. For it is not similarly plausible to maintain (against a Kantian analogue of (i)) that we do not represent space as infinite in geometry, physics or everyday reasoning. Moreover, if I am correct in arguing that the continuity of space secures its holistic structure (see below and notes 37, 44 and 51), then it is demonstrably false to claim (against a Kantian analogue of (ii)) that the idea of space's infinite complexity can be derived from an idea of finitely complex space (s). Thus, Kant's responses to these objections are different from (and arguably stronger than) any responses available to Descartes. If Kant's argument is to be overturned, it must be on the grounds that human spontaneity can indeed account for the infinitary structure of space (time, etc.). This, I take it, is the strategy both Hegel and, in an entirely different manner, Michael Friedman pursue. For a compelling account of Descartes's argument, see Schechtman, 2014.

40. Despite her well-placed and novel emphasis on the twofold infinity of space, Carson's overall reading still falters because it presupposes the essential singularity of intuition. See note 6.
41. Kant operates with a number of different conceptions of infinity. He sometimes says that 'the collection [Menge] which is not a part' is infinite [R4764 (from 1770s) 17:721]. Space would meet this criterion, though it clearly does not entail what we would call 'metrical infinity'. More frequently, Kant characterizes infinity as 'great beyond all measure [über alle Maße groß]' or 'greater than any number' (*Critique* A32/B48, A432n./B460n.; *Kästner* 20:419ff.; R4673 (from 1774) 17:637, R5338 (from 1770s) 18:155). This would imply metrical infinity. To establish that space is infinite in this sense, however, it is not enough to show that every space is surrounded by more; one must show that there is no upper limit on the magnitude of spaces that are delimitations of the whole of space. Kant clearly believes this, but his reasons are not entirely apparent.
42. *De Mundi* 2:403n.; *Critique* A169f./B211f.; R4183 (early 1770s) 17:448; R4424 (c. 1771) 17:541 and R5831 (c.1783/4) 18:365; see also his corollary view that spatial points, which are simple and thus indivisible, are mere limits (cf. A169/B211, B419, A438/B466, A439/B467). It is probable that Kant (like his contemporaries) did not clearly distinguish between infinite divisibility (i.e. denseness) and continuity. Nevertheless, Kant is clearly committed to both the denseness and continuity of space, for he held that the possibility of continuous motion entailed the continuity of the spatiotemporal manifold. See note 49.
43. There is some evidence that Kant might have granted that these claims were unsupported by argument – not because they were dogmatic, but because they were indemonstrable. In *Inquiry*, Kant calls it 'the most important business of higher philosophy' to adumbrate 'indemonstrable fundamental truths'. The examples of such truths he provides recur throughout the critical corpus: the externality of spaces to one another, the non-substantiality of the spatial manifold, and the three-dimensionality of space, 'etc.': 'Such propositions can very well be elucidated [erläutern] if one examines them **in concreto** so as to cognize them intuitively; but they can never be proved' (*Inquiry* 2:281). The problem Carson's Kant faces, of course, is not just that his assertions are indemonstrable, but that they may be *false*.
44. In the *New Essays*, with which Kant was familiar, Leibniz offers a *précis* of his solution to the 'labyrinth of the continuum': 'The true infinite [...] precedes all composition and is not formed by the addition of parts' (1981, 2.17.1, A 6.6:157). This non-compositional priority of the whole over its parts is precisely what leads Leibniz to regard continua (and, *a fortiori*, space and time) as ideal (not real): 'It follows from the very fact that a [continuous] mathematical body cannot be resolved

into primary constituents that it is also not real but something mental and designates nothing but the possibility of parts, not anything actual. [...] [T]he parts are only possible and completely indefinite. [...] But in real things, that is, bodies, the parts are not indefinite – as they are in space, which is a mental thing – but actually specified in a fixed way'. (Letter to de Volder, June 30, 1704; Leibniz 1978, G 2:268f.; cf. G 2:276f., 2:281f., 3:611f., 4:394, 4:491f., 5:17, 6:394, 7:563; for a helpful discussion, see Levey 1998, 58–68). Leibniz also denies that the infinite can be a 'genuine whole', but this should not be taken to suggest he denies the essential unity of space. Leibniz follows Locke (1959, *Essay* 2.17.7-8, vol. 1, 281) in distinguishing the 'infinity of space' from 'space infinite' – i.e. the idea that, since any determinate space may be extended further, space itself is greater than any assignable quantity, from the idea that there is an all-encompassing space whose measure is actually infinite. To view space as a complete whole is, for Locke and Leibniz, to view it as consisting of a determinate number of parts (given magnitudes). Yet to view it as an *infinite* whole is to view it as having more parts than can be expressed in a determinate number. Thus, 'it would be a mistake to try to suppose an absolute space which is an infinite whole made up of parts. There is no such thing: it is a notion which implies a contradiction' (1981, 2.17.5, A 6.6:158). Leibniz's denial that space is a whole does not imply that space is not a unity (in Kant's sense), but only that the status of its 'parts' (as indeterminate, potential and abstract) ensures that it cannot have the (atomic) compositional structure of a 'real thing'. There is evidence that Kant also took the infinitary structure of space and time to entail their ideality: 'The mathematical properties of matter, e.g. infinite divisibility, proves that space and time belong not to the properties of things but to the representations of things in sensible intuition' (R5876 (c. 1783/4) 18:374). I explore the Leibnizian roots of Kant's idealism in Chapter 1 of my dissertation (Smyth, n.d.).

45. These temporal metaphors are only meant to capture the asymmetric dependence of a composite on the parts that compose it. They neither imply that composition is a temporal process (psychological or otherwise) nor that Kant or Leibniz treat it as one (though Locke may well conceive things this way; cf. Locke 1959, *Essay* 2.17.7, vol. 1, 281).
46. The priority relation in this regress can be interpreted in various ways. If it is a relation of sortal-identity dependence, as I take it to be, then the regress is clearly vicious, since, if it does not terminate, one literally does not know what one is talking about at any given stage in the regress. The regress would arguably also be vicious if such priority expressed ontological dependence, but see note 37.
47. E.g. *Physical Monadology* 1:479; *Critique* A169f./B211, A439/B467.
48. The variables' values could be assigned on analogy with a popularized version of Cantor's diagonal proof:

( $x, y, z$ ) 1...2...3... The point is that there is a recursive procedure for picking  
 1        1/1  1/2  1/3    out spatial points with triplets of rational Cartesian coordinates.  
 2        2/1  2/2  2/3    We can thus 'construct' an unbounded and infinitely divisible  
 3        3/1  3/2  3/3    (though not continuous) manifold out of points. Friedman  
 (1992, 66ff.) offers a similar model. Grünbaum 1952 gives a consistent conception of the linear continuum as an aggregate of unextended points, but a discussion of that account and its relation to Kant is out of place here.

49. Both the continuity and infinite extendability of a line segment are secured by Euclid's second postulate, from which the continuity and infinite expanse of space itself follow easily (Euclid 1908, I:154). Kant's favoured geometrical proof of the infinite divisibility of space is drawn from either Jacques Rohault or John Keill (cf. *Physical Monadology* 1:478; Kant 1992, 422n.6) and that proof depends, in turn, on

the infinite extendability of line segments (Kant himself emphasizes this point in R5901 (c.1783/4) 18:379). The physicist's use of infinitesimal calculus in modelling physical motions similarly presupposes the continuity of space (cf. *Metaphysical Foundations*, 4:501, 503, 505, 508, 521f., 551, 557), which Kant explicitly recognizes in noting that the generation of a line (in time) through a fluxion entails the continuity of the spatial manifold (see his notes (R13 and R14 14:53–59) for his 1790 letter to Rehberg (11:207–210), cited by Friedman (1992, 76n.29) and originally highlighted by Parsons 2012). Kant registers the connection between continuity and motion in a figurative but telling manner in the Anticipations of Perception: '[Continuous] magnitudes can also be called **flowing** [**fließende**] because the synthesis (of the productive imagination) in their generation is a process in time, the continuity of which is paradigmatically designated by the expression 'flowing' ('elapsing')' (A170/B211f.).

50. This may seem to collapse the final two arguments of the MEs, but it does not. The penultimate argument, which we have been considering, turns on the difference in cardinality between the elements we represent space as containing, on the one hand, and the elements conceptual representations are capable of containing, on the other. By contrast, the final argument hinges not on the cardinality of elements contained in each type of representation, but on the different kinds of *relation* that obtain between those elements. Parts of space stand in compositional (viz. mereological) relations: two perfectly homogeneous spaces can compose to form a third space, distinct from the other two. By iterating a line segment, one can produce a new segment twice the size of the original. The sort of relation that obtains between the discursive marks of a concept is entirely different; it is, one might say, 'information-theoretical'. I may 'repeat' a discursive mark as many times as I care to within the intension of a concept, without at all altering the content of the latter: the concept < rational animal > is identical to the concept < rational animal with reason > . Although Kant invokes the infinitary case in order to highlight this difference in the internal articulation of intuitive versus discursive representations, the point he is making does not strictly require that he do so. Mereological relations can also hold among the elements of a discrete and finite manifold (e.g. building blocks). So the final two MEs make complementary, but distinct points. The introduction of compositionality (mereology) further enriches the sense in which an intuition represents an individual: it not only refers to a single manifold, as such, but it also represents all the *parts* of that manifold as themselves individuals. This is what enables Kant to say that 'space and time and *all their parts* are intuitions' (B137n.). For more on this contrast, see Wilson (1975), Sutherland (2004) and Anderson (2004, *forthcoming*).
51. It is tempting to think we can derive an idea of infinite complexity by reflecting on finitely complex representations – namely by observing that their complexity can be increased without (apparent) limit. If, as Locke argues, 'it be so, that our *Idea* of Infinity be got from the Power, we observe in ourselves, of repeating without end our own *Ideas*', then why should it be impossible for us to arrive at the idea of infinite space by extrapolating, through our own mental activity, on our ideas of *finite* spaces? (Locke 1959, *Essay* 2.17.6, vol. 1, 279; cf. Leibniz 1981, *New Essays* 2.17.3, A6.6:158). Yet this neglects the holistic mereological structure of space and, in particular, the sortal-identity-dependence of the parts of space on the whole (cf. note 37). This strategy for recursively generating (a representation of) infinite space is a non-starter, for one cannot help oneself to the base of the recursion – namely a (representation of any) finite space – without already presupposing the result the recursion is supposed to generate – viz. the (representation of the) whole of space, of which the part is a delimitation. One cannot even *think* of a finite space except as *in* the whole of space (A25/B39).

52. Cf. also A429n./B457n., A431/B459; *Discovery* 8:222; *Progress* 20:267; R4673 (from 1774), 17:638f.
53. A412f./B439f., A432/B306, A499f./B527f., A518-20/B546-8, A524/B552, A527/B555.
54. Hence, Kant is prepared to argue against Eberhard that ‘if something is an object of the senses and of sensation, all its simple parts must be as well, even if clarity in their representation is lacking’ (*Discovery* 8:205, cf. also *Discovery* 8:209f., 212, 217; A522/B550; *Logic* 9:35). Of course, Kant denies that sensible intuition contains simple parts, but the principle still holds: every part of an object of the senses is represented in sensibility, even if we cannot be conscious of it, since it exceeds our powers of phenomenological discrimination. Thus, the *Critique* holds that ‘space and time and *all their parts* are **intuitions**’ (B137n., my italics). See also Kant’s letter to Reinhold (19 May, 1789) 11:45f. (cited by Domski 2008). To make phenomenological features (such as ‘vivacity’ or ‘phenomenological presence’) or logical characteristics (such as ‘confusion’ or ‘obscurity’) criterial for the sensible status of a representation is to lapse into pre-critical conceptions of sensibility.
55. The opening of the Aesthetic also introduces the idea that intuition depends on affection, which effectively marks out human intuition as a distinctively *sensible* species of cognitive receptivity: ‘thought must ultimately relate [...] *in our case*, to sensibility’ (A19/B33, my italics). Sensible receptivity might be contrasted with a non-sensible receptivity for representations through divine implantation or some other ‘hyperphysical influx’ (cf. B167f.; letter to Herz, 21 February, 1772 (10:131); R5421 and 5424 (c.1776-8) 18:178)). The latter might characterize Aquinas’s angels, whose representations derive from those of the divine mind, though they are not acquired through causal affection or sensation, since angels have no bodies (cf. *Summa* Q.55, Art.2). This suggests that the rationale behind Kant’s claim may have something to do with the fact that we are embodied, or at least with the fact that our receptive representations are associated with a finite spatiotemporal perspective. At any rate, one significant consequence of the claim that our intuitions depend on causal affection is that it enriches the thought-independence of intuition into a more general form of mental-act-independence. The Introduction already demonstrated that knowable objects are independent of our acts of thinking them. The causal notion of affection implies a further distinctness – not just from our acts of thought, but also from our act of intuiting the object in question. The objects that affect us (i.e. the objects we are given to know), therefore, exist independently of the mind’s acts of representing them (in thought *or* intuition). (At this point, acts of reason, acts of productive imagination, etc. are of a piece with acts of the understanding in that they are all classified as spontaneous acts of thought, as opposed to actualizations of receptivity.) This picture is complicated by the fact that the mind (*Gemüt*) can affect itself in inner sense. Yet even self-affection satisfies the relevant type of mental-act-independence, for states represented in inner sense still exist independently of their being thus represented (or subsequently reflected on in second-order thought).
56. Cf. A23-4/B38-9, A30-2/B46-8, A163/B203f., A526f./B554f.
57. Cf. A25/B39, A31f./B47, B137n.

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