Introduction

According to Kant, the understanding generates concepts in virtue of its own capacity to judge (A69/B94), but knowledge requires the application of concepts to what is given by the sensible faculty. His Transcendental Deduction is intended to show that the Categories, concepts that express the unity required for objective judgment, apply to all objects given in sensible intuition. In the Critique’s second (1787, “B”) edition, Kant divides this argument into two stages. The first, consisting of six numbered sections (§§15–20), is intended to show that the categories and thereby a “necessary unity of self-consciousness” must apply to any manifold “contained in an intuition that I call mine”. Kant indicates that this result is only preliminary, because the argument behind it “abstract[s] from the way in which the manifold for an empirical intuition is given” (§21, B144). So in the remaining six sections (§§21–26), it must be shown “from the way in which the empirical intuition is given in sensibility that its unity can be none other than the one” expressed by the categories (B145, emphasis added). Kant scholars, holding a position staked by Dieter Henrich in his (1968), insist that an adequate interpretation of the Deduction must distinguish the stages’ goals and fit them into a unified argument.

At the end of the argument’s second stage, Kant recapitulates its strategy. The conclusion, that the synthetic unity with which objects are given in intuition “can be none other than” that expressed by the categories, rests on the thesis that “unity of the synthesis of the manifold … is already given” a priori along with the intuitions of space and time (§26, B161, emphasis added). The argument thus turns on consideration of the synthesis1 (operation of the mind) responsible for the unity with which space and time are represented.2 It appears to turn,

1. At B161, Kant indicates that he has set out to show that “all synthesis, through which even perception itself becomes possible”, stands under the categories. Cf. Henrich (1968): what must be shown, in the argument’s second stage, is that “synthetic functions” can be “exercised” in intuition itself (652).
2. The argument assumes, more specifically, that space and time are represent-
more specifically, on the claim that the synthesis that unifies the representation of space and time (which Kant calls “figurative” synthesis)\(^3\) is performed by the understanding.

§24, which introduces this synthesis and purports to show its indispensability, thus appears to fulfill the greater part of Kant’s ambitions for the Deduction. As if to underscore its importance, he titles it “On the application of the categories to objects of the senses in general.”

While commentators quickly heeded Henrich’s call to identify the distinctive contribution of the Deduction’s second half, they were slower to see how §24 furthers Kant’s goals.\(^4\) Their neglect of Kant’s account of figurative synthesis is understandable, for it is not clear how the account fits with Kant’s other views, or what it accomplishes.

Kant likens the figurative act of understanding to motion and claims that it makes temporal representation possible by generating the concept of succession. The claim that motion “first produces the

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1. Taking as our sample the most prominent English-language commentaries of the 1980s, Henry Allison’s *Kant’s Transcendental Idealism* (1981) and Paul Guyer’s *Kant and the Claims of Knowledge* (1982), we find the doctrines of §24 either ignored or dismissed. Allison claims that Kant’s characterization of figurative synthesis as an action of the understanding on sensibility “obscures the essential function of [this synthesis] in the argument” (163) and suggests that Kant “has been victimized by his own jargon” when he claims that inner sense is affected by the understanding’s action (266–7). Guyer grants that the synthesis introduced in §24 may be important as a condition on judgments of self-identity, but denies that it can be what “first generates any consciousess of time at all, that is, the psychological or ‘empirical’ condition in which it merely seems to us that we are aware of a succession of different representational states”. For the “metaphysical conception of an understanding which does not itself act in time but which generates temporal order out of a diversity which is itself both atemporal and also precocious verges on unintelligibility” (153).

2. Kant argues that all (determinate) intuition requires unity that is not already found in inner sense (which does not contain “combination of the manifold in it”), but instead imposed by the synthesis, denoted as “figurative”, through which the manifold of inner sense is determined. The representation of time, in particular, requires an “action of the synthesis of the manifold through which we successively determine inner sense” and of which we are conscious (B154).

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5. In the third argument of the Metaphysical Exposition of Time, Kant explicitly claims that the “apodictic principles of relations of time” are strictly universal and apodictically certain (A31/B47), which entails their apriority. Among these principles is the claim that time “has only one dimension: different times are not simultaneous, but successive”.

6. In the earlier passage, Kant argues that motion presupposes something empirical, namely “the conception of something movable”. For in “space considered in itself there is nothing movable; hence the movable must be something that is found in space only through experience; thus an empirical datum” (A41/B58). He repeats the point in the note to §24: “that something is movable cannot be cognized a priori but only through experience” (B155 n.)

7. Christian Wolff, in his monumental textbooks, had given geometry a kinematic foundation by defining figures in terms of the procedures that generate them. But his attempt to introduce motion to geometry was sharply criticized by the renowned mathematician A.G. Kästner, in a text Kant surely knew well. In his own textbook on geometry, Kästner denies that motion explains the generation of geometrical objects. He criticizes, for instance, Wolff’s definition of the line as “generated from the movement of a point”.

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**“The Unity of Time’s Measure”: Kant’s Reply to Locke**

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PHILOSOPHERS’ IMPRINT – 2 –

VOL. 9, NO. 4 (JUNE 2009)
on motion in particular. For motion is just one of the ways in which different determinations of an object can succeed one another in time. On Kant’s view, succession is the characteristic ordering of inner sense, which represents determinations of the mind. It is puzzling that our cognition of succession should be “first produced” by motion, that is, by change in a determination that pertains only to outer objects. It is still more curious that our cognition of succession should require representation of local motion, change in spatial situation, in particular. In the Aesthetic, motion is mentioned just as one—albeit the most important—example of the kinds of alteration that, through the a priori intuition of time, we can cognize a priori.

Kant’s explication of motion “as description of a space”, as a “pure act of the successive synthesis of the manifold in outer intuition in observes that “one cannot represent motion without setting the place that the point now occupies and the place that it is to occupy in the next moment at a distance from one another. This distance is already a line”. Wolff’s definition thus presupposes the very object whose representation it is meant to explain. Kästner thus seems to deny that motion’s use in geometry has explanatory value, even though (as Michael Friedman notes, (1992), 75) he endorses its use in calculus, regarding it as the best foundation for infinitary techniques.

8. Another puzzle in the vicinity is why the concept of succession should depend on an alteration, a change in the determinations of a persisting object. Kant opposes alteration to generation and destruction, the coming-to-be and perishing (respectively) of an object (A187/B230). The First Analogy is intended to show that all change of appearances, i.e., of objects of perception, is alteration. But since this argument comes only in the Analytic of Principles, Kant cannot rely on it here (in the Deduction) to exclude generation and destruction as alternative origins for the concept of succession.

9. The Aesthetic includes a “Transcendental Exposition” of time, intended to show that representation of time yields “insight into the possibility of other synthetic a priori cognition”. Kant has already indicated, in the Critique’s Introduction, that our cognition of alteration can be a priori but not “pure”, meaning that something empirical is “intermixed” with it. Alteration is “a concept that can be drawn only from experience”; the cognition in which it figures, such as “Every alteration has its cause”, is a priori but impure (B3). In the Transcendental Exposition of time, Kant asserts that “alteration and, with it, the concept of motion (as alteration of place)” are made possible by the a priori intuition of time (A32/B48). He proceeds to make clear that alteration and motion have the same epistemological status. Both are excluded from the strictly “a priori data” of the Aesthetic (A41/B58), yet somehow basic to cognition of time and space, respectively.

general through productive imagination” (B155 n.), only deepens the puzzle. On Kant’s view, space and time are made representable to a subject only through the “successive” action of the pure imagination. Since the representations of space and time are themselves conditioned by the successive synthesis, it is not clear how this action can be represented as motion must be, namely as taking place in space and time.

A quarter-century after the publication of Henrich’s article, two scholars finally clarified the importance of the account of figurative synthesis given in §24. Béatrice Longuenesse (1993; translated as [1998]) demonstrates that Kant’s crucial notion of inner sense and his view of its temporal form owe much to Locke. But Kant needs an alternative to Locke’s empiricist account of temporal order. He supplies it by arguing that the representation of succession requires a priori activity of the understanding (namely, figurative synthesis). On Longuenesse’s account, Kant’s use of “motion” is largely metaphorical, serving mainly to highlight the active character of the processes by which succession is represented. By contrast, Michael Friedman (1992) understands it literally. Friedman takes Kant to refer to inertial motion, as conceived in Newtonian physics, by which temporal intervals are measured. So on Friedman’s interpretation, the representation of time’s formal properties presupposes the achievements of natural science.

I believe Longuenesse correctly identifies Locke as Kant’s target, while Friedman is right to read §24 as stating the conditions on representation of temporal magnitude. This paper has two parts. First (in sections 1–4), I compare Kant’s and Locke’s accounts of succession and explain how Kant’s early acceptance of some Lockean views creates difficulty for the Critical philosophy. Then (in sections 5–8)
I explain how Kant achieves resolution with his Critical view of the understanding's effect on sensibility.

Part I

In sections 1–2, I explain how Kant’s account of succession is opposed to Locke’s. Both hold that we represent succession as the ordering of our own representations. Despite important differences in their conceptions of the faculty by which we represent the contents of our minds, both conceive it as a kind of sense. But the representation of its ordering, which must be *a priori* for Kant, is empirical for Locke. In section 3, I explain why the notion of inner receptivity does not fit smoothly into Kant’s Critical philosophy. In particular, as Longuenesse shows, it raises a problem for Kant’s account of mathematical knowledge. Section 4 of this paper argues that Kant attempts to solve the problem in §24 of the Deduction.

1. Locke (and Kant) on what is required to represent succession

My first objective is to explain the two premises from which Locke argues that we need not represent motion in order to represent succession. Locke places two conditions on the representation of succession: the representation of successive determinations, and of an enduring subject in which the successive states succeed. He contends that the representation of motion is not required for the satisfaction of either condition. He argues, further, that this representation is not adequate to satisfy the first condition, on the ground that outer sensory representation is temporally ordered only insofar as it is also represented as “inner”, as contents of the mind. I show in this section that Kant accepts Locke’s view that only the ordering of inner representation is genuinely temporal, as well as Locke’s first condition on the representation of succession. In section 2 I show that Kant also accepts Locke’s second condition, and I explain how Kant avoids the conclusion that the conditions can be fulfilled without representing motion.

Locke follows tradition in conceiving duration as a modification of—specifically, a way of limiting or determining—the continuous existence of something. On this view, to form the idea of duration we must represent something that continues to exist through a succession, in which one “part” of its existence succeeds another. Locke defines duration as the idea “of perishing distance, of which no two parts exist together, but follow each other in Succession” (IL.xv.12). Locke’s problem is to explain how the idea of continuous existence arises from the stream of sensory ideas. These are the only materials from which the idea of duration could derive, but since they are “always … passing in train, one going, and another coming” (II.vii.9), none exists for an interval that can be delimited.

Locke finds the solution to this problem in reflection, the faculty for representing these fleeting ideas as one’s own. To exercise this faculty, the mind “turns its view inward upon it self, and observes its own Actions about” the ideas it has received by sensation “from without”, and “takes from thence other Ideas” (II.i.1). Locke contends that the idea of successive determinations derives from reflection on the states of one’s own mind. Reflection on the “appearances of several Ideas one after another in our Minds … furnishes us with the Idea of Succession” and the idea “that we call Duration”, namely the “Distance between any parts of that Succession, or between the appearance of any two Ideas in our Minds” (II.xiv.3).

Locke is concerned to refute an account on which the notion of succession derives from “Observation of Motion by our Senses”. He ar...
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argues that a man on a ship out of sight of land, who cannot distinguish the positions occupied by the ship by relating them to any visible body, can yet “observe and find Succession, where he could observe no Motion” by perceiving the appearance of “the various Ideas of his own Thoughts in his own Mind … one after another” (II.xiv.6). Locke contends that ideas of succession derived in this manner, from “the train of other Ideas succeeding one another in our Minds, without the Idea of any Motion”, are as clear as those obtained from the “train of Ideas” caused by a body’s motion. He concludes that “we should as well have the idea of Duration, were there no Sense of Motion at all” (II.xiv.16). So, on Locke’s view, even if the representation of temporal ordering should derive from perceptions of motion, the crucial succession is of these ideas in the mind, not of the positions in space that they happen to represent.

Kant’s Critical view of the psychological conditions on representation of succession and time resembles Locke’s in these respects. For Kant, time is the form of our representation “of our self and our inner state”. Kant calls this representation “intuition” to mark it as a variety of sense (A33/B50): it is the inner variety. Like Locke, Kant maintains that representations of outer sense are temporally ordered insofar as they are represented as states of one’s mind:

[S]ince … all representations, whether or not they have outer things as their object, nevertheless as determinations of the mind themselves belong to the inner state, while this inner state belongs under the formal condition of … time, so time is an a priori condition of all appearances in general, and indeed the immediate condition of the inner intuition (of our souls), and thereby also the mediate condition of outer appearances. (A34/B50)

Locke uses the example of the man on the ship to show that being represented as inner is also sufficient to order ideas in time, whether or not those ideas represent successive states of physical objects. Kant makes the same point in his technical terminology, claiming that whatever is subject to the synthesis of apprehension always accords with the formal conditions of inner sense, viz., time (B160). The inevitably successive character of the resulting representation creates the problems that the Analogies are intended to solve, such as how we can justifiably take some of the succession we represent to be necessitated by natural laws. In particular, since Kant shares Locke’s conception of duration as the magnitude of existence, he must confront the question of how successive representation can represent an enduring thing.

2. The Problem of Representing Something Enduring

Kant thus agrees with Locke that in order for us to grasp succession, the determinations that succeed must be referred to enduring objects. More specifically, he accepts Locke’s second condition on the representation of succession, namely, that successive determinations be referred to a single enduring subject, as its states. Only the representation of an enduring subject distinguishes representation of succession from that of differences that can pertain to simultaneously existing things.

For both Kant and Locke, the determinations that succeed are states of mind represented inwardly, as present in some way to the mind. It is crucial here to note that both Locke and Kant hold that the mind represents its own states by a kind of sense. Locke claims that while reflection “be not Sense, as having nothing to do with external Objects, yet it is very like it, and might properly enough be call’d internal Sense” (II.i.4). This complicates Locke’s account of the fulfillment

14. See also the Second Analogy, A190/B235, and Longuenesse’s commentary, 237 n. 50.

15. “Only through that which persists does existence in different parts of the temporal series acquire a magnitude, which one calls duration. For in mere sequence alone existence is always disappearing and beginning, and never has the least magnitude” (First Analogy, A183/B126).

16. At II.xi.17, “the only passages that I can find, of Knowledge, to the Understanding” are said to be “external and internal Sensation”, while in II.i sensation and reflection are referred to as the “Fountains” (§4) which alone (§5) provide ideas to the understanding.
of his second condition, for ideas of reflection themselves flow away, in the stream of ideas of sense (II.vii.9). What is immediately present to the mind, for Locke as well as Kant, is representation that does not endure.

Moreover, both Kant and Locke hold that inner sensory representation is subject to formal limitations that preclude, not just its endurance, but also the association of inner representations with enduring objects of representation. Locke makes the point by contrasting duration with the length that is represented in outer sense. The latter can be “turned” so as to “make Figure, and Breadth, and Thickness” and can pertain to objects in any of these respects. But duration is

as it were the length of one straight Line, extended in infinitum, not capable of any Multiplicity, Variation, or Figure; but is one common measure of all Existence whatsoever, wherein all things whilst they exist, equally partake.

Because “this present moment is common to all things, that are now in being, and equally comprehends that part of their Existence”, to reflection it is as if everything given in this moment “were all but one single Being” (II.xv.11). Since objects occupying a single position in a successive ordering do not differ along a temporal dimension, inner sensory representation cannot distinguish individuals in what is given to it. It cannot even isolate, in what is now present to it, representations or aspects that it can associate with what was present on other occasions. In the first (1781) version of the Paralogisms chapter, Kant expresses the view that the formal organization of inner sense makes it incapable of representing enduring individuals.17

Kant explains that to cognize the numerical identity of an object of outer sense, I “attend to what is persisting in its appearance, to which, as subject, everything else relates as a determination, and … notice the identity of the former in the time in which the latter changes” (A361–362). The form of inner sense, in contrast, “has in it nothing abiding, and hence gives cognition only of a change of determinations, but not of the determinable object” (A381). Kant concedes that the representation of the “I” may withstand the “continual flux” of succession, but says of it that “not the least intuition is bound up with this representation, which would distinguish it from other objects of

So on both Kant’s view and Locke’s, the representation of something that persists through change is a problem, whose solution requires resources beyond the internal sense.

One might expect Locke to solve it through memory, which can associate aspects of present and past representation. But because Locke presupposes succession in his definition of memory (as the power “to revive Perceptions, which it once had, with this additional Perception annexed to them, that it has had them before” [II.x.2]), he cannot use the faculty of memory to explain succession. Instead, he appeals to certain knowledge of the mind’s existence. On Locke’s view, while memory yields only “perpetually perishing” ideas, it represents them as states of something—the mind—whose existence is cognized “so plainly, and so certainly, that it neither needs, nor is capable of any proof” (IV.ix.3). Because we “know that we do exist” while “we are thinking, or … receive successively several Ideas in our mind”, we have the idea of “the Continuation of the Existence of our selves” and can thereby form an idea of the duration “of our selves, or any thing else” whose existence is “Commensurate to the succession of any Ideas in our Minds” (II.xiv.3).18

Since reflection is defined as “that notice which the Mind takes of its own Operations, and the manner of them”, it presupposes, and logically entails, the existence of the mind. But Locke emphasizes that the mind’s existence is not known only by inference. He claims that if I know myself to have a mental state, e.g., to doubt, “I have as certain a perception of the Existence of the thing doubting” as of the doubt, so that experience “convinces us, that we have … an internal infallible perception that we are” (IV.ix.3). Locke thus counts knowledge of the mind’s existence as intuitive (IV.ix.3), which is still more certain

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18. Cf. II.xiv.5: only “having from reflecting on the Succession … of his own Thoughts, got the Notion or Idea of Duration”, can a man “apply that Notion to things, which exist while he does not think”.
than “demonstrative” knowledge acquired through reasoning (IV.ii.4). Through this infallible internal perception, the capacity for reflection fulfills the second condition on the representation of succession.

Kant denies that the enduring thing to which successive representations are ascribed is cognized in this way. Kant would grant to Locke that in representing one’s own activity of thinking, one represents the existence of something that remains identical through the thoughts it thinks. His concern, as I explain in section 3, below, is to distinguish this representation of existence from perception of an enduring thing. From Kant’s point of view, Locke equivocates with regard to the first-person ascription of mental states, which can be understood either as activity or as a kind of experience. Only on the latter construal does it involve the intuition (of the self) required for the application of the concept of existence, thus yielding cognition (without inference) of the self’s existence (B422 n.). But this can be only empirical intuition.\(^39\)

For nothing can be represented a priori in inner intuition except its form, time, which “has in it nothing abiding, and hence gives cognition only of a change of determinations, but not of the determinable object” (A381).\(^20\) So insofar as “I think” has existential import, it lacks apodictic certainty (A347/B305), and the perception on which it is grounded is not “infallible”.

Because this cognition lacks certainty, it is not a priori by Kant’s lights. Hence, Locke’s account is not adequate for Kant’s purposes. Since the representation of something that endures through change conditions the representation of succession, and Kant holds that succession is represented a priori, he must explain how this condition is fulfilled independently of experience.

19. In the proposition “I think”, there is “receptivity of intuition, i.e., the thinking of my self applied to the empirical intuition of the very same subject. It is in the latter that the thinking self must now seek the conditions of the use of its logical functions for categories of substance, cause, etc., so as ... to determine its kind of existence” (B430).

20. Cf. B420: the “determinability of my existence merely in regard to my representations in time” requires “something persisting, and just insofar as I think myself, nothing of the sort is given to me in inner intuition”.

Kant holds that the enduring thing is not an object of inner sense. On his account, the fleeting representations of inner sense are referred to objects of outer sense. From the fact that “time, and thus everything that is in inner sense, constantly flows” (B291), Kant concludes that “to exhibit alteration as [an] intuition ..., we must take motion, as alteration in space, as our example, indeed only by that means can we make alterations ... intuitable”. The possibility of alteration\(^21\)

cannot even be made understandable without intuition, and this is the intuition of the motion of a point in space, the existence [Dasein] of which in different places (as a sequence of opposed determinations) first makes alteration intuitable to us; for in order subsequently to make even inner alterations thinkable, we must be able to grasp time, as the form of inner sense, figuratively through a line, and grasp the inner alteration through the drawing of this line (motion), and thus grasp the successive existence [Existenz] of ourself in different states through outer intuition; the real ground of which is that all alteration presupposes something that persists in intuition, even in order merely to be perceived as alteration, but there is no persistent intuition to be found in inner sense. (B292, emphasis added)

To represent succession, and thus the time in which all succession is ordered, we must be able to refer the different representations that succeed one another to a single persisting subject. But a subject can be represented as persisting through change in its states only through outer sense, as in space.

These phenomenological considerations are a basis for the claims Kant makes in §24.\(^22\) They show that although time “is not itself an
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object of outer intuition at all,” it “cannot be made representable to us except under the image of a line”. Likewise, “we must always derive the determination of the length of time or also of the positions in time for all inner perceptions from that which presents external things to us as alterable” (B156). Since something that endures through change can be represented only in outer sense, it must be represented as having spatial properties. So succession can be represented a priori only through the pure representation of spatial position, as a difference in the positions occupied by an object (such as the point).

We can now answer one of our initial questions. The representation of succession depends on motion, in particular, because all representation of alteration presupposes the ability to represent a single object as occupying different spatial positions. By emphasizing motion, Kant contrasts his view of the representation of succession with Locke’s. But we have not seen how motion of the relevant kind, and thus succession, can be represented a priori.24 This is what Longuenesse is most concerned to explain.

23. Kant appears to hold that position is the only spatial determination with respect to which an object can be represented a priori to differ. In his Metaphysical Foundations of Natural Science, he indicates that change in an object’s outer determinations “can only be considered as the describing of a space” — and thus qualify as a priori by the standards of the Transcendental Deduction (B155 n.) — when the object is “considered only as a point” (4:48g). Kant explicitly contrasts this kind of treatment with consideration of objects as having surfaces and sides along axes of orientation (Explication 2, Remark 1, 4:483). It thus appears that not even change in volume or surface area (let alone in physical characteristics, such as mass and weight, or empirical ones such as color and texture) can be represented in this a priori way.

24. Kant indicates in the Metaphysical Foundations of Natural Science that there is an a priori concept of motion (see preceding note), belonging to “phoronomy”, a discipline that abstracts from all considerations of force and acceleration. In the Critique, he distinguishes motion of this kind, as “alteration of certain

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3. Inner Sense in Kant’s First Critique

To see why it is so important for Kant to distinguish his view of temporal order from Locke’s, we must appreciate the extent to which they agree. Each holds that time is represented through a faculty for inner representation. Their conceptions of this faculty agree in another important respect: both conceive it as passive. Longuenesse regards the passivity of inner sense as the distinctively Lockean element of Kant’s view.25

For Locke, all content represented as inner must derive from the outer senses. Ideas furnished by reflection represent the mind’s operations on ideas that themselves derive from sensation. Locke’s insistence that a man has no ideas until “he first has any Sensation” reflects his opposition to innate ideas. On his view, the mind has nothing to operate on, and so has no operations to inwardly represent, until the outer senses provide it with material:

For since there appear not to be any Ideas in the Mind, before the Senses have conveyed any in, I conceive that Ideas in the Understanding, are coeval with Sensation; which is such an Impress or Motion, made in some part of the Body, as produces some Perception in the

relations in general”, from motion as “alteration of [a body’s] state”, which involves changing speed or direction (and thus requires force) (at A207/B252 n.). But the alteration whose possibility is at issue at B292 is explicitly described as the succession of opposed states of the same thing. Since alteration of this kind is not motion in the phoronomic sense, the intuition through which we comprehend its possibility presumably represents motion that is influenced by force. So it seems that our representation of it must be empirical.

25. Longuenesse argues that the conception of inner sense “as a receptivity to be understood on the model of outer receptivity” (1998, 237) was not found in 18th century German philosophy. While the Wolffians Baumgarten and Meier discussed ‘inner sense’, they intended a different notion. On the Wolffian account, inner sense is simply a faculty for consciousness of one’s own perceptions; it is not explicitly conceived as a mode of experience. Indeed, “reflection”, Locke’s term for the mind’s experience of its contents, was instead used to refer to an intellectual faculty of comparing ideas (Thiel (1997), 61-2). Tetens, who analyzes the notion of inner sense in detail, departs from the Wolffian account. Yet unlike Kant, he does not follow Locke in correlating outer sense with space and inner sense with time (Longuenesse (1998), 234).
Understanding. ‘Tis about these impressions made on our Senses by outward Objects, that the Mind seems first to employ it self … In time, the Mind comes to reflect on its own Operations, about the Ideas got by Sensation, and thereby stores it self with a new set of Ideas, which I call Ideas of Reflection. (II.i.23–4; cf. II.i.4; II.i.17 20.4)

Kant also emphasizes the passivity with which the mind represents its contents. He defines inner sense as “nothing other than the way in which the mind is affected by its own activity” (B67, emphasis added), and agrees with Locke that all content represented as inner must derive from the outer senses.26

As Kant himself acknowledges, this view of inner representation is problematic in the context of the first Critique. There, he sharply separates the receptive faculty of sensibility from the spontaneous faculty of understanding and assigns to each a distinctive set of a priori forms. Sensation’s role is merely to impart matter to the forms, space and time, which “lie ready” [liegen bereit] in the sensible faculty.27 Kant insists that “that within which the sensations can alone be ordered” in formal relations cannot itself come from sensation. He thus faces the question of how these forms can arise and be imposed within a passive faculty.

A still more serious question is how the understanding’s activity can be represented within the form of intuition, specifically, in time. From Kant’s point of view, Locke’s view that we have “infallible internal Perception” of the active mind is a confusion of two faculties. Locke understands reflection as a representation of mental activity that accompanies each thought.28 He also holds that reflection gives knowledge of the continued existence, thus yielding the idea of duration, of an identical thing that has different thoughts in succession.29 Kant

27. By emphasizing that sensation is not coeval with objective representation for Kant, as it is for Locke, an anonymous referee helped to considerably clarify the difference between Kant’s and Locke’s views.

28. The strongest evidence that Locke takes reflection to be inevitable is at II.i.25, quoted in the preceding paragraph. Commentators note that Locke elsewhere appears to deny that all thought is accompanied by reflection. He claims that children, who are ‘imploy’d and diverted in looking abroad’, ‘seldom make any considerable Reflection on what passes within them, till they come to be of riper Years; and some scarce ever at all’ (II.i.8), and that some actions of judgment ‘often escape our observation’ (II.ix.10; see Scharp, 35).

29. Locke claims that men ‘more or less reflect’ (II.i.7), he might hold that reflection always occurs but is greater or lesser in degree, and only negligible in these cases. However, from this claim he infers, not that men get ideas of greater or lesser degree, but that they are “furnished with fewer or more” of them (II.i.7). This suggests that what is greater or lesser, on his view, is the frequency of reflection, so that at the minimum it occurs not at all (compare Scharp, 35–6).

Another way to ease the tension is to suppose that reflection accompanies every active thought, or “operation of the mind”, but not necessarily everything that “passes in the mind”. This is Aaron’s view (130–3; cf. Mishori, 155). It faces the difficulty that in his definition of reflection, Locke says “the term Operations” is used “in a large sense, as comprehending not barely the Actions of the Mind about its Ideas, but some sort of Passions arising sometimes from them”, such as “satisfaction or uneasiness” (II.i.4). For further discussion see Kulstad, 147–9.

29. Locke claims that man obtained the idea of duration “from reflecting on the Succession and Number of his own Thoughts,” and can only then “apply that Notion to things, which exist while he does not think” (II.xiv.5, emphasis added).
holds that the activity of thinking is represented through intellectual self-consciousness, called “pure apperception”, which accompanies all thought as a formal condition. He concedes that the representation “which expresses the consciousness that can accompany all thinking … immediately includes the existence of a subject in itself” (B277), and even that this subject maintains an identity, insofar as representations must be “ascribed to the identical self as my representations” to be “grasped together” in apperception “through the general expression I” (B138). Yet Kant is adamant that the identity of the thinking self across these representations neither is nor implies the identity of the intuited self over time. There is no sure correlation between the ordering of the understanding’s activity and that of inner sense.

The dissociation of inner sense’s temporal order from the ordering of the understanding’s acts creates difficulties. Notoriously, it seems to leave no way to understand the “affection” by understanding that gives inner sensibility its character (as “the way in which the mind is affected by its own activity” [B67]). It also threatens Kant’s account of mathematical knowledge. On Kant’s view, mathematical computation must conform to temporal order but involves combinations that are distinctive to the understanding. If the understanding’s activity is not guaranteed to agree with temporal order, we must ask what constrains it so to agree. The threat to be avoided is that mathematical reasoning should be patterned on experience, and thus empirical.

30. Kant defines pure apperception as “that self-consciousness which, because it produces the representation I think, which must be able to accompany all others” (B132). Of the I think, Kant says specifically that it “is the vehicle of all concepts whatever” (A341/B399); that it is “the form of apperception, on which every experience depends and which precedes it” (A354); and that it “contains the form of every judgment of understanding whatever, and accompanies all categories as their vehicle” (B406).

31. In the Critique’s first (1781, “A”) edition, Kant argues in the Third Paralogism that even if the I which “accompanies and connects” all representation is said to be a “persisting appearance” in the soul (cf. A381), it has so little content that “we can never make out whether this I (a mere thought) does not flow as well as all the other thoughts that are linked to one another through it” (A364). He appears to make substantially the same argument in a Note following the Refutation of Idealism in the second (1787, “B”) edition (B278).

32. The concept of “composition in general”, for instance, both conditions all mathematical reasoning and involves what Kant will later regard as the categories of quantity. Representation of “the composition of the whole” through “an abstract concept of the understanding” (2:387) presupposes the representation of multitudinous (multiplicity or plurality) and omnitudinous (totality) (2:388). Yet composition can be represented only through synthesis that progresses through “things which are coordinate with one another” (2:388n.) in time.

33. In the Inaugural Dissertation, time is fundamental to all mathematical cognitions, geometrical as well as arithmetical, because both continuous magnitudes and discrete quantity can be concretely given in it. See Longuenesse (1998), 228–30. In particular, although the concept of number (which is discrete quantity) originates in the understanding, its “actualisation in the concrete requires the auxiliary notions of time and space (by successively adding a number of things and setting them simultaneously side by side)” (2:397). Kant argues that since number is “distinctly known by counting, that is to say, by successively adding one to one in a given time”, the mind can quantify what is simultaneously ordered, or “render the quantity of space itself intelligible by expressing it numerically” (2:406), only under the condition of time (cf. 2:401–2, §14.6–7).

In the Critique, time is a condition on the “schematization” by which a priori concepts, including mathematical operations, apply to intuition and thus yield cognition (A140–2/B179–85). Kant claims that the schema of magnitude is “number, which is a representation that summarizes the successive addition of one (homogeneous) unit to another” (A142/B182). Thus, the concept of magnitude can have content only “by something like this: That it is the determination of a thing through which it is thought how many units are posited in it. Only this how-many-times is grounded on successive repetition, thus on time and the synthesis (of the homogeneous) in it” (A242/B300).
The relationship between these two aspects of time is left unresolved. On Kant’s 1770 view, the intellect has no influence on sensibility. Since the affection of inner sensibility is not constrained by the understanding’s computational activity, the understanding must conform its activity to the conditions on sensibility (or else their formal agreement is brute coincidence). But since the conditions on sensibility are determined by outer objects, which alone affect it, it is not clear how the understanding could acquire these forms for its own, except through experience. The role of time in mathematical reasoning thus appears to jeopardize its apriority (Longuenesse [1998], 232).

4. The Effect of the Understanding on Sensibility

On Longuenesse’s view, Kant eliminates the potential conflict between the two aspects of time by giving the understanding a role in the generation of sensible representation. The formal agreement between inner sensibility and discursive combination is necessitated by, and explained in terms of, the “effect of the understanding on sensibility”: the synthesis speciosa introduced in §24 of the B Deduction.

The notion of synthesis speciosa is the focus of the discussion of Kant’s full statement of the paradox to be resolved is that inner sense “presents even ourselves to consciousness only as we appear to ourselves, not as we are in ourselves, since we intuit ourselves only as we are internally affected, which seems to be contradictory, since we would have to relate to ourselves passively” (B152). Embedded in this clause are two seemingly paradoxical doctrines (cp. Bird, 379–80). The first is the ideality of the self. Since this is the aspect of Kant’s doctrine of inner sense that most exercised its contemporary critics (Lambert and Mendelssohn), it is natural to suppose that Kant took it to be “the paradox that must have struck everyone in the exposition of the form of inner sense”. Yet there is a second doctrine that Kant’s distinction between the real and apparent selves already begins to “make intelligible”: that the self affects itself. For the following reasons, I think it is Kant’s target here. First of all, Kant refers to §6 of the Transcendental Aesthetic as the “exposition” where the paradox “must have struck everyone”. There, he asserts the transcendental ideality of time, as “a subjective condition of our (human) intuition (which is always sensible, i.e., insofar as we are affected by objects)” (A35/ B51), but he does not emphasize the ideality of “the object of our inner sense (of myself and my state)” until the following section (A38/ B55). Secondly, Kant concludes §24 of the B Deduction with another footnote, in which he professes not to “see how one can find so many difficulties in the fact that inner sense is affected by ourselves” (B156 n.), suggesting that the preceding discussion was prompted by just these spurious difficulties. Finally, since the distinction between apperception and inner sense characterizes the passive and active faculties of the mind, it promises to clarify the notion of self-affection. But if the paradox concerns the ideality of the apparent self, it is not as clearly resolved by the doctrine of apperception (see, again, Bird, 379).
of combination was introduced only in the preceding chapters of the Deduction (through §20). But in them combination, as the source of the discursive unities of concepts and judgments, was sharply distinguished from both that which affects us and that which “lies a priori in the mind” as the form “in which the subject is affected” (B129). Kant must now explain how unity can be imposed, prior to experience, on inner sense. Rather than retract his denial that combination can “come to us through the senses”, as “already contained in the pure form of sensible intuition” (B130), he claims that the understanding can “exercise its spontaneity” even on the manifold of sensibility (B152).

To explain how one and the same faculty can produce both concepts and (distinctively non-conceptual) spatial and temporal unities, Longuenesse supposes that sensibility is affected by a special act of spontaneity. This act is “guided” by the capacity to judge, but “blindly”: without a full or explicit representation of the act’s goal (namely, judgment). Because such acts are only implicitly structured by the forms of judgment, the unities they produce are distinct from any judgment or concept.37 Both inner sense’s form and the representations arranged within it thus result from an act whose “proper function … is to synthesize an empirical given” in judgment ([1998], 228). When temporal unity is thus regarded as a product of the understanding’s activity, it is no longer surprising that concepts should correspond with it.

Longuenesse’s account of §24 explains how representation in inner sense can be regarded as the effect of intellectual activity. But it does not show that it must be so regarded. In other words, Longuenesse explains how the intellect can affect sensibility, but does not show that only this affection can produce representation ordered within the

37. More specifically, the unity produced by such an act is distinct from any clear concept. Concepts express rules for the understanding’s activity, which is oriented towards judgment but can be more broadly conceived as comparison (B1). The concept is clear when the comparison is of concepts and accords with explicit forms of judgment (see [1998], 115). It is “obscure”, however, when the rule governs the comparison of sensible representation in apprehension (118). Rules of this kind are identified with schemata (ibid.), and are produced by “blind” syntheses (245). Since Kant sometimes treats schemata as concepts, some products of blind synthesis may be conceptual after all.

form of time. Without puzzling over the relation of the ordered representations to physical objects or things-in-themselves, there is already a question as to why all inner sense should require the understanding’s activity. So it must still be explained why inner sense necessarily conforms to the understanding’s forms of unity—to mathematical concepts, in particular—as is required for their a priori applicability.

The gap in Longuenesse’s account of §24 is not an oversight. On her view, the argument that inner sense is necessarily subject to the understanding’s activity is formally completed only in a later section of the Deduction.38 And to give “specific content” to the relationship between the imaginative synthesis that generates temporal representation and the understanding’s activity of combination (245), and thus make the Deduction’s “import … fully explicit”, we must look beyond the Deduction, to the empirical exercise of the capacity for judgment (as I explain in section 7). Apart from the considerations that support Longuenesse’s view, we already have reason to look beyond §24 for an account. For Kant does not seem to argue in it for its thesis, that “through inner sense we intuit ourselves only as we internally affected by our selves” (B156). Kant concludes in §24 that “we cannot even represent time without, in drawing a straight line (which is to be the external figurative representation of time), attending to the succession of the synthesis by which we determine inner sense” (B154). But the phenomenological considerations he adduces do not show that the determination of inner sense can be represented only through an action of synthesis that determines the inner sense, i.e., that motion of the relevant kind must be represented as an effect of the self’s action.

To be sure, Kant does not rest the thesis of §24 on phenomenological considerations alone. He is relying on earlier sections of the B Deduction. I will first show that Kant explicitly states the missing premises in these sections, then ask whether he is entitled to them.

38. According to Longuenesse, after §26 of the Deduction Kant is entitled to claim that sensibility “must be receptive not merely to affections received from outside, but also to affections from inside, from the spontaneity of the mind, or the act of figurative synthesis, which alone can transform the outer affection into an intuition” ([1998], 220, emphasis added).
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Kant states in the Deduction’s first sentences that all combination is performed by the understanding, and argues in §17 that combination is made possible by the “synthetic unity of apperception”, i.e., the (possible) unification of representation in a single self-consciousness. He concludes that objects of outer sense are represented only by means of this unification:

Thus the mere form of outer sensible intuition, space, is not yet cognition at all; it only gives the manifold of intuition a priori for a possible cognition. But in order to cognize something in space, e.g. a line, I must draw it, and thus synthetically bring about a determinate combination of the given manifold, so that the unity of this action is at the same time the unity of consciousness (in the concept of a line), and thereby is an object (a determinate space) thus cognized. (B137–8)

To represent “something in space”, the understanding must combine the given manifold into a “determinate space”. Kant’s point in §17 is that the understanding must act to unify given representation according to the concept of a line. The cognition of the line is thus meant to illustrate the general claims of §§16–17, that given representations, to be “combined in one consciousness”, must be “grasped together in a self-consciousness” (B136), and that this self-consciousness, though “not itself yet the consciousness of”, still presupposes the representations’ synthesis (B134).

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Kant echoes the language of §17 in §24 when he claims that inner sense “contains the mere form of intuition, but without any combination of the manifold in it, and thus it does not yet contain any determinate intuition at all” (B154). Presupposing the general claims of §§16–17, he goes on to assert that combination is “possible only through the consciousness of the determination of the manifold through the transcendental action of the imagination” (ibid.). If the conclusions of §§16–17 are granted, it follows that the representation of time in the image of a line involves an action through which the understanding determines the manifold and of which it is conscious.

But although the missing premises are stated in these extremely dense and abstract passages, they are not clearly argued for. Two lines of argument might be extracted from the passages. I will argue that neither entitles Kant to assert these conditions on the representation of a line.

Since the argument of §§16–17 shows that the manifold is determined by action of which the understanding is conscious, it suffices to prove the thesis of §24 — as long as the representation of a line, and thus of temporal succession, involves determination of the manifold. “Determination”, in the relevant sense, is an action or representation through which an object is thought by the understanding and under a definite concept, i.e., an action or representation that excludes alternative ways of conceptualizing the object. In geometry, for instance, the

40. ‘Determination’ is a technical term that Kant inherits from the Wolffian school, in which it has several meanings. The Wolffians understand determinability as a relation either between predicates and concepts, which makes judgments true, or between objects and properties, on which a thing is “determined” with respect to a property that it must either have or lack. From a God’s-eye point of view, the former (logical) notion of determination coincides with the latter (metaphysical) notion: the complete concept of a thing both determines it with respect to every possible property and also determines all of the predicates that can be asserted of it. Thus, the logical notion was thought to have epistemological import (see Longuenesse (1998), 95–96). In the Transcendental Dialectic, Kant prises these notions apart (A571–2/B599–600). Here, he understands “determination” in an epistemic sense. But on his view, the significance of “determination” — in either sense — consists in the exclusion of alternatives. A concept is determinable insofar as “of every two contradictorily opposed predicates only one can apply to it”, and a thing is determined insofar as “among all possible predicates ..., insofar as they are compared with their opposites, one must apply to it” (A571–2/B599–600).

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understanding “determines space into the figure of a circle, a cone, or a sphere” (4:321–2). Earlier in §24, Kant has claimed that the synthesis that determines the forms of sense a priori must be “an effect of the understanding on sensibility”, for such a synthesis must be “an exercise of spontaneity, which is determining and not, like sense, merely determinable” (B131–2). Kant can claim to have defined “determination” as something that can be carried out only by the understanding. The problem, of course, is that he has not argued that the representation by which the line is generated involves determination, so understood.

Alternatively, Kant can argue that the succession by which the line is generated requires the action of the understanding because it unifies diverse representations (in the figurative representation that combines the successively generated parts of the line). If this is his strategy, in §17 he need not assume his technical notion of “determination”. We can take him to mean by “determination” merely the unification of representation, and to argue on this basis that the understanding is responsible for all determination: because cognitions “consist in the determinate relation of given representations to an object”, and an object is “that in the concept of which the manifold of a given intuition is united”, the understanding is consequently “the faculty of cognitions” (B137). But Kant has only asserted, not shown, that combination, “the representation of the synthetic unity of the manifold” (B130–1), can “never come to us through the senses … ; for it is an act of the spontaneity of the power of representation, and … one must call the latter understanding, in distinction from sensibility” (B129–130). To claim that all unification is by definition the work of the understanding is hardly more satisfying than to claim that all determination is.

It is especially important for Kant to show that the combination

involved in the representation of temporal succession could not “come to us through the senses”, because on Locke’s account, which §24 is intended to supplant, sensibility does unify the representation of what affects it. I will argue that to establish the superiority of his own account, Kant must assume that this unification provides for the quantification of time.

Part II

I show in section 5 that Locke intends to explain the measurement of time with his account of the representation of temporal succession. In section 6, I marshal textual evidence that Kant’s account is specifically intended to surpass Locke’s in this respect. In section 7, I explain in detail why neither Friedman nor Longuenesse finds a basis for an account of temporal measurement in §24. Longuenesse, in particular, holds that the unit by which temporal magnitude is measured must be expressed by an empirical concept (of a discrete object encountered in space and time). It follows that on her view, the synthesis introduced in §24 cannot partition temporal intuition into units. In section 8, I argue that if this synthesis is taken (as by Longuenesse) to conform to the understanding’s “effort to judge”, rather than any particular concept, it explains the representation of units of temporal magnitude.

5. Locke’s Account of the Measure of Duration

Locke presents temporal measurement as the next “natural” application of the capacities responsible for the representation of succession. He notes that special difficulties attend the measurement of time, in comparison with space. Duration, unlike extension, cannot be measured by the mere “Application of the Standard or Measure we make use of, to the thing of whose extension we would be informed”. No temporal interval can be used as a standard, because the parts of

41. Longuenesse suggests that Kant’s view of the understanding, as responsible for all unification, has a basis in the A Deduction. It is among the “initial steps of the demonstration in A” that the B Deduction “takes ... for granted and completes the argument where the earlier exposition seemed insufficient or faulty” ((1998), 59). I have not explored this alternative because I assume in this paper that the B Deduction is intended to replace, rather than complement, the A edition.

42. The “next thing natural for the Mind to do”, once it has “got the Idea of Duration”, is “to get some measure of this common Duration, whereby it might judge of its different lengths, and consider the distinct Order of things’ existence (II.xiv.17).
succession are fleeting and cannot “be put together to measure one another”. Nor can any spatial interval, because nothing is “a measure of Duration, but Duration”. Locke concludes that nothing will serve to measure time but “what has divided the whole length of its Duration into apparently equal Portions, by constantly repeated Periods” (II.xiv.18). He undertakes to show that in temporal measurement (as in the representation of succession) motion has no privileged role.

Locke concedes that motion, specifically the sun’s revolution, is in fact the primary measure of time. But he argues that this is merely an accident of history. We need not have used the representation of a moving object to measure time, for “any constant periodical Appearance, or alteration of Ideas in seemingly equidistant Spaces of Duration, if constant and universally observable, would have as well distinguished the intervals of time”. For instance, if the sun

had been lighted up at the same distance of time that it now every Day comes about to the same Meridian, and then gone out again about twelve hours after, and that in the Space of an annual Revolution, it had sensibly increased in Brightness and Heat, and so decreased again, the “regular appearances” of its light and temperature would have served as well. (II.xiv.19)

So according to Locke, the use of the sun’s appearances to measure time does not depend on the assumption that it traverses equal distances between its appearances in a part of the sky. More generally, motion is not required for the measurement of time.

Locke holds that it is neither necessary nor sufficient. He is at pains to defeat the view that, by means of motion, the (fleeting) parts of time can be measured with as much certainty as the (enduring) parts of space. He seems to rehearse the reasoning of the Scholium to the Definitions in Newton’s Principia. Newton motivates the distinction between absolute time and its sensible measure43 by pointing out that “in astronomy, absolute time is distinguished” from its most familiar

measure. The “natural” days into which time is divided by the sun’s transits over the same meridian, i.e., the intervals between noons found on a sundial, “are actually unequal” due to irregularities in the relative motion of the sun and the earth. So for astronomers, the natural day is not absolute time but must be corrected “in order to measure celestial motions [by] a truer time”. Newton argues, further, that since any motion “can be accelerated and retarded” (i.e., may take more or less time to cover the same distance), but “the flow of absolute time cannot be changed”, it “may be that there is no uniform motion by which time may have an exact measure” (410). He intends at least to warn that no periodic process can be assumed to match the uniform flow of absolute time.

Locke is happy to make the point that “the Equality of any other returning appearances [can only] be known by the same way” that the “inequality in the natural days” was found. He argues that these judgments cannot be made by comparison with motion. He takes Newton’s point to be, not that each motion might not be uniform, but that no motion can be known to be uniform. Locke contends that the acceleration and retardation to which all motion is subject result from physical conditions that cannot be known by us,44 and concludes that “Duration in it self is to be considered as going on in one constant, equal, uniform Course; but none of the measures of [duration], which we make use of, can be known to do so” (II.xiv.21).

On Locke’s view, the equality of temporal intervals is known only

44. Locke argues in particular that we cannot determine the extent to which the motion used to correct solar time is subject to perturbation. He notes that the sun’s motion “has been found in several parts unequal”, so “Men have of late made use of a Pendulum, as a more steady and regular Motion, than that of the Sun”. Yet, he claims, “if any one should be asked how he certainly knows, that the two successive swingings of a Pendulum are equal, it would be very hard to satisfy himself, that they are infallibly so”. For while “we cannot be sure, that the Cause of that Motion which is unknown to us, shall operate equally”, we are sure “that the Medium, in which the Pendulum moves, is not constantly the same”. And variation in either the cause or the medium will “alter the Equality of such Periods, and thereby destroy the certainty and exactness of the measure by Motion” (II.xiv.21).
by comparing the “train of Ideas” that passes in them (II.xiv.21). This claim rests, in part, on a comparison between the rate of ideas’ succession and that of other natural processes. Locke’s argument that motion does not make temporal representation possible uses, as well as the ship at sea, a second example, which (he claims) also shows that the rate of ideas’ succession has an upper bound. Locke claims that if a cannonball flies through the room and the flesh of a bystander, it must successively touch the walls of the room, the parts of the flesh, etc., but “no Body, who ever felt the pain of such a shot, or heard the blow against the two distant Walls, could perceive any Succession, either in the pain, or sound of so swift a stroke” (II.xiv.10). In denying that the bystander hears or feels successions “in” the cannonball’s stroke, Locke seems to mean that she does not hear or feel the ball to collide successively with different parts of the room and the flesh. She presumably represents it as occupying all these places at once, as an auditory and tactile “streak”, in the same way as a camera whose shutter remains open throughout the ball’s transit. This is because the rate at which one of her ideas is succeeded by another is, like the speed of the camera’s shutter, too slow to capture the ball’s motion.

For Locke, this is the rate, not only of the succession of ideas (in the understanding), but of their first arising (in the senses). He claims that objects such as the ball, which are “not perceived to move” because they complete their transit “in less time than our Ideas are wont to succeed one another in our Minds”, fail to “cause any train of Ideas in the Mind” because they fail to “affect the Senses distinctly with several distinguishable distances of their Motion” (II.xiv.8). Thus, a minimum temporal interval is required for one idea to succeed another in the mind because it is required for the idea to first arise. Perceptual experience segregates into discrete, minimal “chunks” as the senses first confront the world.

Locke’s comparison between the succession of ideas and the cannonball’s motion demonstrates that the rate of psychological succession is bounded, but does not amount to an empirical measurement of its rate. A physical process such as the cannonball’s flight is perceived to contain no succession, i.e., to take no time. While we can intelligibly say that it requires less than the time required for an idea to succeed another, we cannot say by how much, nor compare its rate to that of any other seemingly instantaneous process. Since we cannot quantify it, we are hardly in position to measure time by reference to it. The comparison serves, rather, precisely to illustrate that standards of temporal quantity have no meaningful application to processes that elapse within the interval required for one idea to succeed another. Locke thus proposes to identify the “Instant”, the least portion of time, as “that which takes up the time of only one Idea in our Minds, without the Succession of another, wherein ... no succession is perceived”. Our experience of the cannonball is an example of “such a part of Duration ... wherein we perceive no Succession” (II.xiv.10). Locke appears to take for granted that the rate of succession is the same for all individuals.

47. I am indebted to Yaffe’s discussion of what he calls “the halting sensation view”. Also thank an anonymous referee for prompting me to clarify this point.

48. I am very grateful to the anonymous referee whose comments brought me to grasp this point more clearly.

49. Michael Ayers takes Locke to be more confident that the succession of ideas, which “constitutes the primitive clock through which we must perceive and judge any other succession”, can be held to the standard of a physical process. Ayers grants that the instant, or “period from one idea to the next”, is “a natural unit of measurement”. Yet measurement by instants “is provisional” (231), and should be regarded as “better” as it comes “closer ... to the most fundamental natural regularities” (232). But since Ayers grants that the succession of ideas “gives us our sense of time”, it is still not clear how we can conceive the rate of a physical process as a measure of time, to which the succession of ideas can be compared.

50. The close parallel between Locke’s treatments of time and space is further
On Locke’s view, we grasp the instant through the faculty of reflection. He maintains that “every Idea in our Understandings; every Thought of our Minds” brings the idea of unity “along with it,” and that since this idea accompanies every idea—of any object, within or without the mind—it is “the most intimate to our Thoughts” (II.xvi.1). Locke claims that duration is “capable of … division ad infinitum” and has no smallest part. Yet, because we can clearly and distinctly represent any idea as unitary (II.xvi.3–4), we can form a clear and distinct idea of “the least Portion” of duration: such “a small part in Duration, may be called a Moment, and is the time of one Idea in our Minds, in the train of their ordinary Succession there” (II.xv.9).

Through further exercise of the faculty of reflection, the instant can be used in the mathematical assessment of duration. Any idea that is perceived as unitary can be “repeated” in the mind, and “by adding the Repetitions together”, we form ideas of the natural numbers 2, 3, … So having an idea of this unit length of duration, we can “in our Thoughts, add such lengths of Duration to one another, as often as we please, and apply them, so added, to Durations past or to come” (II.xiv.27). By “applying” such an idea to—that is, comparing it with—a temporal interval, the interval is shown to equal some (integral) multiple of the instant.

At the close of his chapter on duration, Locke takes himself to have shown that the faculties of sensation and reflection make it possible to represent temporal intervals as equal with respect to a measure. So any alternative account of temporal representation must also explain this ability. Longuenesse does not recognize Locke’s chapter as an account of mathematical representation. But by pursuing her insight, that §24 is Kant’s reply to the chapter, we reach Friedman’s conclusion, that §24 is intended to explain the application of quantitative concepts to time.

Yet this interpretation has not been favored (even by Longuenesse). I will first show that it does not lack textual support, and then explain the substantive considerations that weigh against it.

On a first reading, §24 may not seem to concern quantitative representation in particular. It is not obvious that Kant is discussing the representation of “lengths of time” [Zeitlänge] and the drawing of shapes in their specifically mathematical, as opposed to everyday, employment. His only reference to mathematics, his assertion that motion belongs to both transcendental philosophy and geometry, is confined to a footnote. It seems merely to illustrate and underscore the main point, the distinction between apperception and inner sense.

But Kant’s concern with the mathematical representation of time is evident on closer examination. The thesis of §24 is that the representation of a temporally unified self involves the understanding as well as inner sense. Towards the end of the section, Kant restates his point as follows. That “the I that I think” through apperception “is to differ from the I that intuits itself and yet be identical with the latter as the same subject” is clearly shown.

from the fact that time, although it is not itself an object of outer intuition at all, cannot be made representable to us except under the image of a line, insofar as we draw it, without which sort of presentation we could not know the unity of its measure [die Einheit ihrer Abmessung] at all … (B155–156)

Since Abmessung can be translated “dimension”, Kant may seem to say only that in order to represent successively generated representations as unified within a dimension, we must be able to juxtapose the representations with one another in space. But the dimensionality of time can be understood as a condition on measurement. Indeed, Abmessung can also mean “measure”. So the significance of our ability to represent time “under the image of a line” may be that it conditions the ability to represent temporal intervals as equal with respect to a measure, that is, a standard which can be used for further comparisons. And the ability
to determine whether something equals, exceeds, or falls short of a measure is just what Kant takes to be required for the application of quantitative concepts to that thing.\footnote{In his account of the categories of quantity in the metaphysics lectures, Kant asserts that quantity is “nothing more than determination, how large something is” (29:991). He claims that if a thing’s “magnitude cannot be determined in relation to a measure”, then “I do not know how large it is in itself, but rather only that it is too large for any of my concepts” (29:835), implying that to know how large a thing is (and thus determine its quantity), I must relate its magnitude to a measure. In Reflection 6338a, Kant explicitly associates the first two categories of quantity with (respectively) the unit that serves as a measure, and relative largeness and smallness (18:660).

Kant holds, more specifically, that the “measure” in relation to which a thing’s quantity is determined must be capable of comparison with other things. He contrasts determination of quantity and being (or being thought as) a quantum, defined as “the unit conjoined from many homogeneous things” (29:991). He claims that by comparing “the thing with itself and its parts one can clearly cognize that there is a quantum, but one can never determine, without comparison of a thing with other things ... how large it is”. In his example, what must be compared with other things is specifically the unit by which the thing is sized: “the earth has 5400 miles — the mile is 1/15 of a degree — degree 1/360 of the largest meridian ... it is futile to find the magnitude of the earth without comparison of the measure” (29:992).}

Kant indicates later in the B Deduction that §24 is intended to explain the application of mathematical concepts to sensible representation. He leaves hints that are powerfully illuminated by Friedman (in (2003), 40–3).\footnote{In a footnote to §26, Kant claims to have explained in §24 how time, and space, are represented with unity that belongs to intuition rather than to the understanding’s concepts (B161 n.). As Friedman emphasizes, Kant here makes clear that space is represented thus (as unified) in mathematics. So he takes himself to have explained, in §24, at least some of the applications of mathematical concepts to sensibility.\footnote{Comparison of §24 with unpublished texts\footnote{Kant claims in the note to §26 that space and time are represented as “formal intuitions” which contain, as well as the forms of intuition, a manifold that is unified through a synthesis in which “the understanding determines the sensibility”. He claims that the representation of space as formal intuition belongs to geometry (B161 n.). It can be argued that this representation requires only geometrical (mereological and topological) but not arithmetical (metrical) concepts, so that Kant has explained the application of only some mathematical concepts. Moreover, space as formal intuition may belong to geometry only as a condition on geometrical construction, not as an object cognized within this science. For this representation of space can be associated with the “infinite given magnitude” which is said in the Aesthetic to contain an infinite set of representations within itself (B40). As such, it can be identified with the “metaphysical” representation of space that Kant distinguishes from its “geometrical” representation. Space in its metaphorical guise is the “single, infinite, subjectively given” space in which “the possibility of all spaces, which proceeds to infinity, is given” and which grounds the possibility of geometrical construction, while geometrical space is “finite” and “only given in so far as it is generated” (20:420). If the representation of space as formal intuition is metaphysical rather than geometrical, then its representation conditions geometrical construction. Rather than requiring geometrical concepts, it first makes them possible. So in explaining this achievement, Kant will not have explained the use of mathematical concepts.}}

The similarity between §24 and later passages of the Critique to show that like them, §24 concerns the representation of temporal magnitude. To explain motion’s role in the representation of succession (in section 2 above), we compared §24 with B292, where Kant discusses motion’s role in the representation of alteration. Friedman argues, on the basis of the similarity between B292 and remarks in the Metaphysical Foundations of Natural Science, that all of these passages are intended to explain the “pure doctrine of motion” or pure part of natural science ((2003), 34). Through this application of mathematics to sensible representation, we are able to fix a standard by which the equality of temporal intervals can be measured. Friedman’s appeal to these texts leaves him especially vulnerable to the charge (explained in section 7 of the main text) of making Kant’s argumentation circular. An objector could argue that Kant can appeal to the achievements of mathematics and natural science in these texts, because he has already explained their possibility in the Deduction itself. But to read his later references to mathematics and science back into the Deduction is to leave him with no basis on which to explain their possibility.\footnote{And with the Critique of Judgment. Kant claims there that “the measurement [Messung] of a space ... is at the same time the description of it” (5:258), indicating that motion of the kind mentioned in §24 can already be a measurement.}
The continuation of this passage further supports my claim that for Kant, the conditions on “cognition of a magnitude” are also conditions on the cognitive achievement discussed in §24, viz., knowing the unity of time’s measure [Abmessung]. Kant goes on to claim that the “line itself exhibits all points simultaneously, but the drawing of the line expresses the successive sequence or the alterations in time” (29:994). Thus, the conditions on representation of temporal magnitude are already satisfied by the conditions on representation of time’s Abmessung, as Kant states them in §24. There, he claims that the representation of Abmessungen serves, together with the representation of succession, to illustrate the indispensability of figurative synthesis: “we cannot represent the three Abmessungen of space at all without placing three lines perpendicular to each other at the same point, and we cannot even represent time without, in drawing a straight line ..., attending merely to the action of the manifold through which we successively determine the inner sense, and thereby attending to the succession of this determination in inner sense” (B154–5).

56. Here I follow Paul Guyer, who analyzes this argument in connection with the Refutation of Idealism. According to his summary, Kant “begins with the simple assertion that change can be recognized only by comparison with something that endures and then infers that this something must be spatial by using ... the additional assertion that space is intrinsically permanent” ((1987), 297).

55. The continuation of this passage further supports my claim that for Kant, the conditions on “cognition of a magnitude” are also conditions on the cognitive achievement discussed in §24, viz., knowing the unity of time’s measure [Abmessung]. Kant goes on to claim that the “line itself exhibits all points simultaneously, but the drawing of the line expresses the successive sequence or the alterations in time” (29:994). Thus, the conditions on representation of temporal magnitude are already satisfied by the conditions on representation of time’s Abmessung, as Kant states them in §24. There, he claims that the representation of Abmessungen serves, together with the representation of succession, to illustrate the indispensability of figurative synthesis: “we cannot represent the three Abmessungen of space at all without placing three lines perpendicular to each other at the same point, and we cannot even represent time without, in drawing a straight line ..., attending merely to the action of the manifold through which we successively determine the inner sense, and thereby attending to the succession of this determination in inner sense” (B154–5).


58. Kant’s invocation of the representation of temporal magnitude is especially striking in this dialectical context, because it is tactically weak. As Guyer points out, the idealist is not obliged to grant Kant’s premise, that my existence in time has a numerical magnitude (300–1).

59. Reflexion 6514, in which Kant works out the argument in more detail, confirms that it assumes the possibility of representing magnitude, indeed of representing number. The passage begins “We cannot represent any number to ourselves except through successive enumeration [Aufzählung] in time and then through collecting this plurality [Vielfalt] together in the unity of a number. This latter, however, cannot occur otherwise than by my placing them beside one another in space; for they must be thought as given simultaneously, that is, as collected together in one representation, for otherwise this plurality [Vielfalt] constitutes no magnitude (number); simultaneity, however, cannot possibly be cognized unless in addition to my act of composition [Zusammensetzen] I can apprehend (not merely think) the plurality [Vielfalt] as given both forwards and backwards.” After further argumentation (quoted in Guyer (1987), 298, whose translation I follow), Kant concludes that “I must be just as conscious of the existence of outer things as I am of my existence in time, though, to be sure, only as appearances yet as real things” (18:616).
means of the representation of something that endures in space) and the quantification of time.

7. The Ambition of the Transcendental Deduction

Friedman’s interpretation fits Kant’s texts nicely. But it has not found favor60 because it does not seem to respect the ambition of Kant’s Transcendental Deduction. The Deduction purports to state the most general conditions for the possibility of a priori cognition. The aim of §24 is to identify the conditions on representing a temporally unified self. If the unity that pertains to time is specified in mathematical terms, Kant’s explanation of its possibility may not extend to all the conceptual forms under which the manifold of inner sense can be unified.

Worse, Kant may fail to explain even mathematical representation of temporal unity. Since the representations of inner sense are “perishing”, Kant’s claim to the representation of temporal unity is comparable to his assertion (in the Transcendental Aesthetic) that time is represented as infinite (A32/B48). Neither is an obvious datum of experience. So it is not clear what entitles Kant to take them as premises. In the Aesthetic, Kant argues that time can be represented as infinite only in intuition, and as commentators observe, he faces a dilemma. If our only representation of time’s infinitude is mathematical, then Kant’s conclusion, that time is a form of intuition, does not explain mathematics’ possibility, after all. To avoid the charge of circularity, Kant must find a phenomenological or psychological feature of temporal representation that attests to time’s infinitude. But there seems to be no such feature. A similar problem confronts the Deduction. If our only representation of time’s unity is mathematical, then Kant’s argument already assumes mathematical cognition as a premise. So his conclusion, that inner sense is unified by an act of understanding, does not supply a foundation for mathematical cognition.

60. See, for instance, Bird: the discussion of figurative synthesis in §24 “does not refer explicitly to geometry, mathematics, or physics and can naturally be read as a requirement for a ‘synthesis speciosa’ in productive imagination even for ordinary perception” (441).

“The Unity of Time’s Measure”: Kant’s Reply to Locke

In response to Friedman, Longuenesse raises similar considerations.61 On her view, the goal of §24 is not to explain the application of mathematical concepts to time. She emphasizes that the Deduction does not complete Kant’s account of even the application of the categories to intuition. The relationship between the “successive synthesis” of pure imagination, which generates temporal representation, and the discursive activity whose unity is expressed by the categories is stated in only “the most general manner” in §24. For it to make “any sense” ((1998), 245), we must consider how the forms of discursive combination are applied. Longuenesse suggests that the forms first present themselves to the understanding in their logical aspect, as structures that give unity to judgments. They manifest as categories, i.e. concepts required for objective thought, only as the understanding applies them to “blindly” guide the synthesis of sensible representation and “reflects” the perception unified by this synthesis under concepts in empirical judgment (165). In the same way, the “specific aspects of the synthesis speciosa” first manifest through this use of the discursive forms (244–5). On Longuenesse’s view, then, the agreement between discursive unity and the intuition produced by imaginative synthesis can be fully understood only by regarding both the imaginative and discursive activities of understanding as aspects of the more fundamental capacity for empirical judgment — and appealing to the empirical exercise of this capacity.

In particular, the application of the categories of quantity (unity, plurality, totality), through which alone magnitude is assessed, requires reflection in empirical judgment of intuition that is first synthesized

61. Longuenesse holds that what Kant regards as the dependence of the sciences on particular representational capacities does not permit him to make use of these sciences in accounting for the capacities. For instance, she claims that while “according to Kant, Newtonian science rests on’ the necessary conformity of appearance to the category of cause, ‘precisely for this reason … Newtonian science is of no use at all to prove the causal principle: this would be circular” ((2001), 209). Similarly, because the ability to regard a temporal interval as a “unit” (comparable in magnitude to other intervals) is indispensable for the application and justification of mathematics and Newtonian physics, it cannot be justified by appeal to them.
under the blind guidance of the logical forms of quantity (singular, particular, universal). Since pure concepts originate in syntheses that first find expression in empirical judgment, they are formed and applied only through the mediation of concepts whose use is empirically justified.62

Longuenesse's account of quantitative judgment centers on Kant's claim that the categories of quantity are applied through "the successive addition of (homogeneous) units" (A142–3/B182). By means of empirical concepts, a plurality of homogeneous units can be represented as a totality, in accordance with the defining condition on magnitude, that "a plurality of the homogeneous together makes up a totality".63 Kant elaborates on the properties of magnitude in his metaphysics lectures (29:991–2). He glosses "homogeneity" as "things from one and the same sort [Gattung] (genus). He understands genus in the Aristotelian sense of a node of classificatory hierarchy, designated by a predicate that captures what diverse objects have in common.64 The representation of homogeneity thus requires representation of a respect in which parts are alike and which differentiates them from others items belonging, with them, to a more inclusive kind. The parts' quantitative likeness (equality with respect to a measure) does not suffice for homogeneity in Kant's sense, since measures of different sizes cannot be ordered within a hierarchy of generality. (Magnitudes of size two units, for instance, are not a particular kind of magnitude of size-one or of size-four, as hounds are a particular kind of dog.65)

Longuenesse argues that we must take "homogeneous" to mean "thought under the same concept" in order to understand how the application of the categories is made possible by the activity of judging in accordance with logical forms ((1998), 250 n. 16). On her view, both empirical judgment and pure representation have a common basis in operations of "comparison" with respect to concepts. To judge, for instance, that "Some bodies are heavy" or "All trees in this garden bear fruit", a subject must "run through the elements thought under the subject-concept ('body', or 'tree in this garden') and compare them with respect to the predicate-concept ('heavy', or 'bearing fruit')." Because this judgment is empirical, in it the forms of logical quantity (particular: "Some x's are y's" and universal: "All x's are y's") are applied to particulars given in empirical intuition. So the judgment must involve figurative synthesis, of intuition of objects alike in a certain respect, in virtue of which they fall under a common concept ("body", "tree") (249–50). This use of the logical forms of quantity thus yields, first, sensible representation of units to which the categories of quantity can be applied; and additionally, through "reflection" on the rule of the synthesis, explicit representation of the categories themselves.66

What is most important for our purposes is that on Longuenesse's (1992) account all judgment of magnitude rests on comparison of perceived particulars, exemplars of such concepts as are expressed by...
“count nouns” in natural language.\(^6\) Cognition of discrete magnitude is thus prior to that of continuous magnitude, and Kant’s account of the representation of temporal quantity must await the details (given in the System of Principles) of the categories’ application to particulars given in space and time.\(^6\) We will see that in her (2006), Longuenesse takes a more liberal view of the comparison required for judgments of magnitude.\(^6\) Yet she still maintains that “the notion of number as attaching to arbitrarily chosen units of measurement”, as in the representation of temporal continuity, is “to be understood in light of the notion of number as attaching to extensions of concepts, which itself is referred back” to “our capacity to subsume individuals under concepts, and thus to represent them as homogeneous units” (44–5).

Longuenesse appreciates that Kant aims to supply a ground for mathematical cognition in more basic operations of the faculties. But her account, while respecting the scope of Kant’s ambition, seems to leave him unable to fulfill it. If Kant makes the representation of continuous magnitude, such as duration, depend on the representation of discrete magnitude, he will not improve on Locke’s account. But because Locke supposes that the representation of continuous magnitude cannot be justified independently of that of discrete magnitude, he appears to have no way to justify it at all.

Locke argues that the ability to represent the magnitude of space and time as discrete, under numerical concepts, is not an adequate basis for the representation of continuous spatial or temporal magnitude. He claims that the ideas of spatial and temporal infinitude derive from the “power, we observe in ourselves, of repeating without end our own ideas” (II.xvii.6), in particular, the power of adding together ideas of the unit interval of space or time.\(^7\) Spatial and temporal intervals are represented only in terms of our inability to exhaust them through this discrete “progression of the mind” (II.xvii.7). Hence, they are cognized only as exceeding the sums of our measures, not as comparable in size.

So Locke concludes that we have no clear or distinct representation of any space or duration “which is not made up of, and commensurate to repeated numbers of feet or yards, or days or years, which are the common measures ... whereby we judge the greatness of these sort

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\(^6\) Since comparison, as Longuenesse understands it, belongs to the process through which concepts are “made as to their form” (cf. Jäsche Logik, 9:94), it does not operate on the concepts themselves, and instead has as its “indispensable condition” “the x, y, z’s represented under the concepts” ((1998), 248). In her (1998), Longuenesse argues that in this process “singular judgment comes first, expressing the attribution of a concept to a singular object given in intuition (‘This body is heavy’), then particular judgment, in which a concept is attributed to several objects (‘Some bodies are heavy’), and lastly universal judgment” (248).

\(^7\) Whether one takes the idea of a foot or mile, or “of any stated lengths of space”, and “how often soever he doubles, or otherwise multiplies it, he finds, that after he has continued this doubling in his thoughts, and enlarged his idea, as much as he pleases, he has no more reason to stop, nor is one more jot nearer the end of such addition, than he was at first setting out; the power of enlarging his idea of space by further additions, remaining still the same, he hence takes the idea of infinite space” (II.xvii.3).
of quantities” (II.xvii.13). Even the “apparent infinity” of spatial and temporal divisibility has the infinity also of number, but with this difference, that in the former considerations of the infinity of space and duration, we only use addition of numbers; whereas this is like the division of a unit into its fractions, wherein the mind also can proceed in infinitum, as well as in the former additions, it being indeed but the addition still of new numbers … (II.xvii.12)

So although Locke acknowledges that infinity is “attributed primarily in [its] first designation” to space, time, and number (II.xvii.1), he concludes that all our ideas of infinity represent “nothing but the idea of the infinity of number applied to determinate parts” (II.xvii.10). The representation of continuous magnitude thus appears to have no justification on Locke’s view. Unless Kant can provide it with justification that does not depend on the representation of discrete magnitude, he will do no better than Locke.

Without comparing Longuenesse’s (1992) interpretation of Kant to Locke’s view, Friedman raises a similar problem for it. He denies that our cognition of continuous quantity can be explained in terms of intellectual activity whose goal is judgment. This activity necessitates the representation of spatiotemporal objects as discrete exemplars of sortal concepts. Friedman observes that given such a concept as “human being”, ’it of course makes sense to ask how many singular objects fall in its extension’, so that “counting, number, and the mathematics of discrete quantity” can be applied to intuitive representation ((2000a), 207). But, Friedman argues, it does not follow that the mathematics of continuous quantity can be likewise applied.

Though Longuenesse and Friedman differ as to whether the representation of continuous magnitude should be explained in terms of the quantification of discrete particulars, they agree that it is not explained in the Deduction. While Longuenesse holds that the faculties introduced in the Deduction must be considered in relation to their empirical employment, Friedman discounts their explanatory power.

For Friedman, Kant’s characterizations of “understanding” and “sensibility” are of limited significance. In his germinal work on Kant’s philosophy of mathematics ((1985), (1992)), Friedman largely dispenses with Kant’s “transcendental psychology”. He retains only Kant’s view that representation produced by the understanding must be expressible within formal logic (so that inferences are syllogistic, judgments are of subject-predicate form, and concepts are ordered in a genus-species hierarchy). More recently (in (2000b) and (2003)), Friedman emphasizes that sensibility, as the mode through which we are affected by objects, is passive. With this emphasis on sensibility’s passivity comes a corresponding emphasis on the understanding’s activity. Yet Friedman still maintains that the faculties’ respective contributions to cognition must be understood in terms of the achievements of natural science. So on Friedman’s view, the Deduction cannot explain the representation of temporal magnitude in terms of our faculties. The only way for Kant to show that uncountable spatial and temporal magnitude can be represented under concepts of quantity is to appeal to...

71. In his chapter on clear and distinct ideas, Locke drives home the point that obscure (unclear) and confused (indistinct) ideas cannot be used for the assessment of spatial or temporal magnitude. The idea of quantity that is not exhausted through repeated addition, “which is to represent only bigness, must be very obscure and confused, which we cannot distinguish from one ten times as big, but only by Number: so that we have clear, distinct Ideas, we may say of Ten and One, but no distinct Ideas of two such Extensions.” Of this quantity, or “what remains to be added (wherein consists the Infinity), we have but an obscure, imperfect, and confused Idea; from or about which we can argue, or reason with no Certainty or Clearness …” (II.xxix.16).

72. Friedman is specifically concerned to deny that the argument of the Deduction “proceeds at a much higher level of generality and abstraction” than that of Kant’s Metaphysical Foundations of Natural Science, where specific Newtonian principles are discussed. He argues that the application of understanding to sensibility discussed in §24 is not merely exemplified or illustrated by Kant’s attempt to provide foundations for Newtonian mathematical physics, but that “consideration of this example is built into the very structure of the Deduction’s argument” ((2003), 35). It thus appears that on his view, the only way to understand what understanding and sensibility contribute to cognition is to consider how they make Newtonian mathematical physics possible.
the incontrovertible fact that it is so represented, in the mathematical sciences of his time. Friedman thus takes Kant’s reference to “motion” literally, as “a reference to inertial motion: the privileged state of force-free ‘natural’ motion which is basic to modern physics” ((1992), 131), through which alone speed is measured and the equality of temporal intervals determined. To save Kant’s “transcendental” arguments from circularity, Friedman denies that they are meant to provide the sciences with an independent foundation.

8. The Capacity to Judge and the Representation of Temporal Magnitude

Our examination of §24 thus far vindicates Friedman’s interpretation. We found no argument to support Kant’s assertion that the representation ordered in inner sense (i.e. temporally) is unified by an action of the understanding. So even if Kant assumes only that time is represented under concepts of discrete magnitude, he fails to link this representation to a cognitive achievement that could also explain the application of concepts of continuous magnitude. In fact, as we will see, Kant argues from the assumption that time’s magnitude is represented as continuous to the conclusion that temporal representation requires the action of the understanding. He thus appears to have no epistemologically prior premises from which to derive the applicability of measures to time. Yet I maintain that his argument is not necessarily circular.

First of all, Kant’s premise is relatively weak. The cognitive achievement he takes for granted does not presume the sophistication of higher mathematics and its application in Newtonian physics. Kant assumes that continuous manifolds of intuition can always be segregated into “units”, intervals that can be grasped as wholes and compared to a given measure. Indeed, for Kant “continuity” simply means the possibility of arbitrary division: “A quantum whose magnitude leaves the multiplicity of parts indeterminate is called continuum. It has as many parts as I wish to give it” (in contrast to a quantum discretum, “by the magnitude of which the multiplicity of parts is determined” (Politz Metaphysics, 28:560)). The expression of continuity, thus understood, does not require much mathematical or scientific sophistication. But the representation of continuity is the basis for the most important mathematical and scientific achievements of Kant’s time, viz. the integration and differentiation techniques of the calculus, and their application in Newtonian physics. Kant’s account of these achievements in terms of the understanding’s activity (given in the first Critique’s System of Principles and the Metaphysical Foundations of Natural Science) can be genuinely explanatory, even if understanding is itself conceived in terms of the ability to represent continuous spatiotemporal magnitude.

More importantly, the conclusion yields genuine understanding of the premise. If we take Longuenesse’s view of the understanding, as itself guided by the capacity to judge, we can explain the ability to represent temporal magnitude in terms of our representational capacities: namely, in terms of the understanding’s influence on imagination. Because the faculty responsible for the representation of temporal continuity is not itself characterized in mathematical or scientific terms, Kant can appeal to this representation without frustrating the aims of the Deduction. Longuenesse’s interpretation is thus an essential complement to Friedman’s approach. I will show how her account can be amended, to eliminate the epistemic priority of discrete over continuous magnitude.

In his Critique of the Power of Judgment, Kant argues that the understanding’s guidance enables the imagination to “make any measure adequate for any given magnitude”. While the first Critique states conditions on thinking of objects through concepts, the third Critique explains how we relate to objects through aesthetic pleasure. Kant argues only that they are valid in the context of ordinary experience. (Thanks to Eric Schliesser for prompting this clarification.)
that insofar as this pleasure is intersubjective (rather than a mere state of the subject), it is associated with the fulfillment of epistemic objectives: with progress in the understanding's drive to use its concepts. More specifically, it is occasioned by “reflective” acts of mind that aim to form, but do not yet involve, empirical concepts. The distinctive concern of the third Critique is with reflective acts in which an object is represented as apt to provoke pleasure in the subject, rather than under any concept. But reflective acts can also culminate in concepts, and in fact generate all of our empirical (and many of our scientific) concepts of objects. So, as Longuenesse emphasizes, the third Critique illuminates acts of mind that are presupposed by, but not tantamount to, thinking of objects under concepts.

Kant claims in the third Critique that the application of numerical concepts to intuition involves a merely reflective act of mind, of the kind that occasions aesthetic pleasure. He observes that in this application, the “unit” of the numerical concept serves as a “measure”, with which the parts of what is numbered are compared. He argues that if “the magnitude of the measure ... in turn is to be estimated [geschätzt] only by means of numbers whose unit would have to be another measure”, we could “never have a primary or basic fundamental measure”, and hence could never represent an intuited object’s magnitude through a numerical concept. Hence, the magnitude of whatever is to be used “as a measure or a unit for the estimation of magnitude by means of numbers” must be grasped “in an intuition”, in an act of mere reflection, rather than under a concept (5:251). Kant claims that such a quantum (object having magnitude) is “taken up intuitively” through two operations of the imagination: apprehension and comprehension [Zusammenfassung], or unification, which Kant also terms *comprehensio aesthetica*. As he introduces the faculty of imagination in the first Critique, Kant apportions it to sensibility even as he claims that some of its operations must be regarded as effects of the understanding. Apprehension and aesthetic comprehension clearly belong to its sensible employment.

Kant thus concedes what he is so concerned to deny in §24. He in fact grants to Locke not only that sensibility itself can unify representation, but that this power is subject to the limitations on sensory intake. Kant claims that apprehension “can go on to infinity”, but sensible unification “becomes ever more difficult” as it progresses, for “the partial representations of the intuition of the senses that were apprehended first already begin to fade in the imagination as the latter proceeds on to the apprehension of further ones” (5:252). *Comprehensio aesthetica* ceases to be possible once the apprehended quantum exceeds the imagination’s retentive capacity. Kant claims that the imagination can hold together only so much representation because the apprehension

German Grüsse, “magnitude”, for the Latin terms *quantum* and *quantitas*, which are related as concrete instance and abstract property. For helpful discussion, see Sutherland (2004a).

In the first edition of the third Critique’s Introduction, Kant claims that apprehension “of the manifold in intuition” is always the work of imagination alone, and introduces *appercipio comprehensiva*, comprehension of “[the] manifold in the concept of an object” (20:220). In contrast to apperceptive comprehension, aesthetic comprehension can be merely reflective rather than determining. It is thus not among the imaginative syntheses that Kant credits to the understanding in the first Critique, where he writes that imagination “belongs to sensibility”; but insofar as its synthesis is still an exercise of spontaneity, which is determining and not, like sense, merely determinable ... its synthesis of intuitions, in accordance with the categories, must be the transcendental synthesis of the imagination, which is an effect of the understanding on sensibility” (B151–2).
of each “partial representation” of sensible intuition requires a certain amount of time. So even on his conception, sensible unification is limited by the extent of the Lockean “instant”: the minimum temporal interval in which an idea can be apprehended.

So sensibility’s capacities to grasp and retain, which are common to Kant’s account and Locke’s, cannot explain our ability to represent the magnitude of objects too large to be apprehended as multiples of a common measure. We have focussed on the imagination’s ability to unify manifolds that exceed its retentive capacity, but its ability to unify manifolds that lack qualitative similarity is equally in need of explanation. To represent parts as homogeneous, it must represent a trait common to all of them. Yet arbitrarily small parts cannot even be discriminated by the senses, let alone classified under a common kind. Kant cleaves to his assumption that any object intuited in space and time can be represented as an arbitrarily large (or small) multiplicity of arbitrarily small (or large) parts. He concludes that apprehension and aesthetic comprehension are not the only actions by which magnitude is measured. On Kant’s view, the apprehension involved in judgments of magnitude is executed only with the understanding’s assistance. The imagination is empowered to choose “for its unit [either] a magnitude that can be grasped in a single glance, e.g. a foot or a rod, [or] even a …diameter of the earth, whose apprehension but not composition is possible in an intuition of the imagination” (5:254), because even a diameter of the earth can be grasped as a whole “not through comprehensio aesthetica though certainly through comprehensio logica in a numerical concept” (5:255). Our ability to unify manifolds, even those that frustrate aesthetic comprehension, under numerical concepts shows that cognition of number involves “logical” comprehension, directed by the understanding. The imagination is not restricted to the regularities apprehended in sensibility, but also able to comprehend according to the understanding’s forms.

By giving the understanding this role, Kant is able to explain the application of arbitrarily large numerical concepts to intervals of space and time, which no Lockean account can show to be possible.

Longuenesse is thus exactly right to emphasize that “for Kant, the [representation] of a unit is not given with each sensory object”, but rather “presupposes an act of constituting a homogeneous multiplicity, which requires an a priori form of our imagination” and of “our understanding (a rule of the … discursive act of thinking the logical quantity of judgment)” (260). But I do not think we should follow her in insisting that the multiplicity’s homogeneity must be represented under a common concept. Recall, she understands “the notion of number as attaching to arbitrarily chosen units of measurement” in terms of “our

77. The “effort to take up in a single intuition a measure for magnitudes … requires an appreciable time for its apprehension” (5:259). By way of illustration, Kant observes that if one stands close enough to the Egyptian pyramids to apprehend each of the stones clearly, one cannot get “the full emotional effect” of their magnitude. For there are too many partial representations to be apprehended within a given time, in which the gaze moves from the pyramid’s base to its apex: “the eye requires some time to complete its apprehension from the base level to the apex, but during this time the former always partly fades before the imagination has taken in the latter, and the comprehension is never complete” (5:252).

78. I claim only that all the parts must be represented as similar with respect to a quality, not that each part must be distinct with respect to a quality. Kant explicitly denies the latter in the first Critique: if an object of appearance “is presented to us several times, but always with the same inner determinations (qualitas etquantitas), … the difference of the places of these appearances at the same time is still an adequate ground for the numerical difference of the object”. For example, “in the case of two drops of water one can completely abstract from all inner difference (of quality and quantity), and it is enough that they be intuited in different places at the same time in order for them to be held to differ in number” (A263–4/B319–20). For discussion of this point, see Sutherland (2004a).

79. It may also involve aesthetic comprehension, insofar as measurement of such manifolds is grounded in an intuitively grasped “basic fundamental measure”. In his lectures on metaphysics, Kant says rather laconically that “the earth has 5400 miles — the mile is 1/15 of a degree — degree 1/360 of the largest meridian. All of this can also be applied to a pea” (29:992). In the third Critique, Kant illustrates how measures applied to the earth’s surface ultimately relate to objects whose whole extent is present to the senses: we may use the height of a man to estimate a tree that “may serve as a standard for a mountain, and if the latter were, say, a mile high, it could serve as the unit for the number that expresses the diameter of the earth, in order to make the latter intuitable” (5:256). But while we can compare the mile, degree, and meridian to such objects, we need not do so in order to represent them as unified.
capacity to subsume individuals under concepts, and thus to represent them as homogeneous units” ((2006), 44–5).80 “Subsumption” is here a technical term, reserved for applications of concepts that the process of reflection (in empirical judgment) has made fully explicit.

In Longuenesse’s (1992), these concepts are ordinary empirical and scientific concepts, of the kind expressed by “count nouns” in natural language. However, we cannot suppose that these concepts are adequate to capture a respect in which arbitrary units are alike. In fact, there may be good reason to suppose that the units will not fall under any concept available to us.

An excursus through eighteenth-century geology would be required to see how the problem arises with respect to Kant’s own example, the strata making up the earth. We can bring out the problem by updating the example. Suppose that I, a reasonably sophisticated cognitive agent, want to represent the area of a smooth green leaf in nanometers. What is a concept with respect to which its nanometer-size portions are units? I cannot think them simply as “parts of the leaf”, for larger and smaller portions are also units with respect to this concept, and so would be included in the sum that is to be the area. I cannot specify (even demonstratively) a nanometer-sized “template” that each part can be assumed to “match”. For the “matching” of the parts to the template could be conceptualized only as qualitative similarity. But I know from experience that magnification reveals variegation in surfaces that appear uniform in color and texture to the naked eye. I also know that parts of organisms, by virtue of the simpler structures that make them up, serve various biological purposes. Since structures within the leaf belong to the plant’s respiratory and circulatory systems, at least some

80. Longuenesse explicitly denies that on her view, “measuring a line-segment, a surface, or a volume, is forming a discursive judgment in which one generic concept is subordinated to another” ((2006), 45). But on her view, measurement – as cognition of magnitude – presupposes the formation of such judgments. They make available the concepts required for the representation of homogeneity, as Longuenesse understands it (as meaning “thought under the same concept”). So the conditions on the representation of magnitude, as Longuenesse interprets them, can be met only through the formation of discursive judgments.

of its matter must be relatively porous. The experience that enables me to discern the fine- and gross-grained structure of intuited objects is itself ground to doubt that all of the leaf’s nanometer-sized portions fall under a common visual, tactile, biological, or physical kind. So I have neither an empirical concept that holds of all these parts, nor any expectation of acquiring such a concept. And it is highly implausible that any of my (non-quantitative) a priori concepts should hold of just the nanometer-size portions of the leaf.

In (2006), Longuenesse broadens her view of the concepts that may express the respects in which magnitudes’ parts are alike, to include quantitative concepts such as “equal to the segment s”. The objects contained in the extension of such concepts, which are subject to operations of comparison, need not be given in intuition as discrete. So on Longuenesse’s amended account, discrete magnitude is no longer epistemically prior to continuous magnitude. But Longuenesse fails to explain how the parts of magnitudes, thus conceived, can be homogeneous in the sense of belonging to a common genus if (like the nanometer-sized portions of the leaf) they cannot be brought under the (fully explicit) concepts ordered in genus-species hierarchies.81 To explain how the imagination, under the direction of understanding, can unify these multiplicities into homogeneous wholes, we must extend her important observations.

To explain the priority of logical forms with respect to concepts, Longuenesse suggests that the forms of discursive combination are “as it were engrained in the mind as logical functions” ((1998), 244). Her

81. To explain the understanding’s ability to unify parts that do not fall under a common empirical concept into a homogeneous whole, we might also revise our understanding of the homogeneity required for representation of magnitude. In his important (2004a), Sutherland argues that the notion of homogeneity most relevant in this context involves conformity to the classical doctrine of ratios and proportions (162–4) rather than membership in the extension of a concept that belongs to a genus-species hierarchy. However, Sutherland grants that representation of magnitude in fact requires homogeneity of both kinds (see note 79). So an account of the kind I give below would also be needed to explain how a magnitude’s parts could be homogeneous in Sutherland’s sense.
primary concern is to defend the (bold and distinctive) thesis that the categories emerge from sensible synthesis and empirical judgment, by showing how these processes can be implicitly guided by the forms, even before the forms are explicitly represented as categories. But she also holds (less controversially) that ordinary empirical concepts issue from the same processes.\(^8\)

Recall that the logical forms of quantity structure the apprehension of intuition in empirical judgment that is universal (‘All x’s are y’s’) or particular (‘Some x’s are y’s’) in form. Longuenesse holds that the forms also structure apprehension in “silent” judgments that precede and make possible the explicit representation of the concepts ‘x’ and ‘y’. They function in two ways to allow all or part of a manifold that is alike in some respect, apt to be brought under the concept ‘x’, to be unified under a different form. They first give structure to intuition, providing us with sensible representation through which we can “sift” to identify the apprehended “difference” according to which the manifold can be unified. Their second function is to guide the discursive synthesis in which (some or all of) the manifold parts alike in the relevant respect are compared with respect to the difference. Reflection on this discursive synthesis then yields the concepts ‘y’ and ‘x’, which explicitly express, respectively, the difference and the respect in which the parts are alike (1992, 134). So while the homogeneity that characterizes the parts may not be expressed by any concept that is already available to the understanding, further discursive activity yields an empirical concept (‘x’) that both expresses what is common to the parts and (by virtue of containing ‘y’ under itself as a species) fits into a genus-species hierarchy.

Since the logical forms of judgment are available prior to the formation of concepts, they can guide the representation of unities that no empirical concept can capture. The understanding’s access to them explains its ability to choose any measure for an intuitive manifold and to partition the manifold into intervals equal to its chosen unit. As we have seen, the understanding cannot presume that the intervals it unifies will display (sensible) qualities with respect to which they are internally uniform and similar to one another. I propose that the understanding can simply represent its chosen unit as the whole of the manifold that is unified in a particular act of synthesis (according to the form of universal judgment). The understanding can divide the manifold it seeks to measure by repeating this act, to comprehend part of the manifold according to the form of particular judgment.\(^9\)

The parts produced in this manner will be alike with respect to the form by which they are comprehended, for the form is imposed on each of them by one and the same understanding, in a deliberate drive to conform each synthesis to its chosen standard. (The role of these forms in the representation of temporal quantity is thus the same as in self-consciousness: they make it possible to unify manifolds whose representation in inner sense lacks all uniformity. As Kant explains in the B Deduction, it is only because manifolds can be unified under them (§20) that I do not have “as multicolored, diverse a self as I have representations of which I am conscious” (B134).)

So if we regard the understanding as the faculty responsible for judgment, and interpret the cognitive achievement whose conditions are stated in §24 as the representation of temporal magnitude, we at

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82. Longuenesse indicates that she breaks with tradition precisely in taking the categories to emerge from processes that both early modern philosophers (within both the British empiricist and Continental rationalist traditions [(1998), 112–3]) and previous commentators associated exclusively with empirical concepts.

83. In (2004a), Sutherland emphasizes intuition’s role in the representation of these part-whole relations. He suggests, in particular, that the homogeneity of a magnitude’s parts and their composition to produce a greater whole can be represented only in intuition. The present suggestion, that the understanding synthesizes homogeneous parts under the guidance of logical forms, thus appears to be in tension with Sutherland’s view. However, I think the tension is only apparent. First of all, Sutherland allows that the categories of quantity (which correspond to the logical forms of quantity in judgment) have some role in representing these relations (175). Secondly, Sutherland’s arguments show that the homogeneity of a magnitude’s parts cannot be represented through concepts that contain ‘intensions’ and ‘extensions’. On Longuenesse’s analysis, representation produced by the action of the understanding under the (perhaps implicit) guidance of logical forms need not have this, or any other characteristically discursive, structure. For on Longuenesse’s analysis, this same action produces both “the discursive unity of concepts in judgment” and “the intuitive (synthetic) unity of the sensible manifold” (1998), 200–1.

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last see why the latter requires the former’s activity. The true point of Kant’s remark that the unity of time’s measure can be known only “under the image of a line, insofar as we draw it” (B155–6, emphasis added) is that the understanding (the active self) is not limited to “tracing” whatever qualitative regularities are (passively) received by the senses, but is instead able to synthesize any arbitrary portion of the manifold and unify it into, e.g., a line segment. We can see how the “effect of the understanding on sensibility” that Kant posits in §24 issues in the representation of homogeneity, and thus of magnitude, if we understand it as the imposition of a logical form on the understanding’s synthesis.

Kant’s description of motion as an “action of the subject” — that is, as the product of the active faculty of understanding, rather than the passive faculty of sensibility — thus has the significance Longuenesse claims for it. In her analysis of B154, where Kant claims that to represent time we must attend “to the act of synthesis of the manifold whereby we successively determine inner sense” and “the succession of this determination of the manifold in inner sense”, Longuenesse emphasizes that succession, its representation, and representation of time require an “act of self-affection”. Kant’s conclusion, as she states it, is “that we do not obtain this intuition [of time] from perceiving the motion of things in space, but rather from our own action” ((1998), 228–9). In (2001), she makes clear that this action is “the original effort to judge” that “makes it possible to synthesize particular manifolds under the guidance of the categories” (203).

**Conclusion**

When Kant claims, against Locke, that the representation of temporal order requires motion, his point is not just that change perceived in inner sense must be referred to relatively stable objects of outer sense. He also rejects Locke’s view that the representation of temporal order derives from passive observation of the rate of ideas’ succession (that is, to use Kant’s terminology, of the time in which a representation is apprehended). Kant’s alternative account of the representation of succession and temporal magnitude is intended to show that the representation of a temporal unit requires action, the imposition of a priori form, by understanding on sensibility. This action must be represented as motion, i.e., as change in spatial situation, because succession cannot be represented in any other way. So Longuenesse is right that Kant must invoke motion to complete his reply to Locke, and Friedman is right that he intends thereby to explain the imposition of a metric on time. However, neither Longuenesse nor Friedman exposes the full subtlety and power of Kant’s account. Kant concedes to the Lockean that the sensible faculty can itself unify a manifold. He even gives sensibility’s unifying function a role in quantitative representation. Yet its relevance to mathematical cognition ultimately depends on its subordination to the “power of judgment”. For, Kant argues, if the unification of representation were merely sensible, it could not explain the application of mathematical concepts. The role of the action he calls “motion” in mathematical representation thus does not jeopardize the latter’s apriority, but rather guarantees it.84

84. It is my pleasure to acknowledge a number of intellectual debts. First and foremost, thanks are due to Tyler Burge and Michael Friedman, who commented on multiple drafts of this paper and helped to shape its argument. I am more generally indebted to Friedman for emphasizing the importance of §24. Béatrice Longuenesse generously provided extensive comments on an earlier draft. Gideon Yaffe’s contribution to the NYU Conference on Modern Philosophy, Fall 2004, first stimulated my thinking on Locke. For helpful suggestions and discussion, I thank Christopher Phillips, John Carriero, Michael Ayers, Charles Parsons, John Perry, Lorne Falkenstein, and audiences at the New England Colloquium for Early Modern Philosophy, UCLA, Stanford, University of Western Ontario, University of Iowa, University of California-Davis, University of Miami, University of Texas at Austin, Caltech, University of California-Santa Barbara, Virginia Tech, University of California-Irvine, Brown University, and University of Massachusetts-Amherst. I am also grateful for the thoughtful and detailed comments provided by anonymous referees for this journal.
**Works Cited**

Kant’s works are cited, following standard practice, according to volume and page number of the Akademie edition of Kants Gesammelte Schriften (Berlin: Walter de Gruyter, 1902), except for the Critique of Pure Reason, which is cited according to page number of the 1781 (A) and 1787 (B) editions. Translations from the Critique are based on those of the Cambridge Edition, by Paul Guyer and Allen Wood (Cambridge University Press, 1998).


Yaffe, Gideon. “Locke on Consciousness, Personal Identity and the

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**“The Unity of Time’s Measure”: Kant’s Reply to Locke**

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