Much of the discussion that compares the work of Deleuze and Peirce has focused upon Peirce’s theory of signs. This is understandable given the emphasis Deleuze himself gives to Peirce’s typology of firstness, secondness, and thirdness in his *Cinema* books, as well as the importance of a theory of signs in his *Proust and Signs*. In the following essay I will explore a more subtle but equally significant interplay between the work of Deleuze and Peirce by showing how their concept of habit emerges in response to addressing the problem of the infinite, or what I will call the problem of supertasks.\(^1\) The concept of habit plays a crucial role in accounting for the individuation of determinate, existent things. The importance of passive synthesis as set forth in the second chapter of *Difference and Repetition* is well-known and has been routinely discussed within the Deleuze literature. By contrast, a lesser known theme within Peirce’s writings is the importance of habit in accounting for the individuation of things. That habit is integral to Peirce’s theory of belief is well established, but its ontological and metaphysical significance, and its implications for understanding pragmatism, have not received the attention it deserves. In the first section I will introduce the problem of supertasks and discuss the traditional response to this problem which has been simply to reject the possibility of such tasks—or, as this is more commonly known, reject the actually infinite. The second section will set the stage for the pragmatic response to the problem of supertasks by contrasting Hume and Frege on the nature of concepts. Third section will turn to Kant’s first antinomy—namely, can one legitimately believe in a world that does

or does not have a beginning in time. Kant argues that neither option is tenable, and this primarily because a belief in such a world would involve a supertask. To avoid the antinomy, Kant rejects the very notion of a world in-itself and as a consequence any belief in the world. This leads us to the fourth section where I will argue that Peirce’s metaphysics sets out to restore a belief in the world, and belief in an infinite world. The fifth and final section shows how a key concern of Deleuze’s project was precisely to restore belief in the world, a belief that entails the supertask of affirming the actually infinite; or, as this comes to be understood Deleuze and Guattari’s What is Philosophy? the affirmation of the infinite is integral to the philosophical task of creating concepts, or to what I will call an infinite pragmatics.

I

Let us begin with an example. I put an apple on a table, wait half a minute, then remove the apple. I wait a quarter of a minute and put the apple back on the table, removing it after an 1/8th of a minute, putting it back on after a 1/16th of a minute, and so on ad infinitum. Let us assume for the sake of the argument that at the end of one minute I have completed an infinite sequence of placing and removing the apple. At the end of the minute, is the apple on the table or not? This question seems unanswerable and has led many to assume that such a task, often called a supertask, is impossible. Zeno, however, in his well-known paradox of Achilles and the tortoise, sought to show that if such supertasks are indeed impossible then even the most mundane of tasks becomes impossible as well, despite all appearances to the contrary. As Aristotle recounts Zeno’s

\[2\] I borrow this example from José Benardete’s Infinity: an essay in metaphysics (Oxford: Clarendon Press, 1964).
paradox, the conclusion one is led to is that “the quickest runner can never overtake the slowest, since the pursuer must first reach the point whence the pursued started, so that the slower must always hold the lead.” (Physics VI:9, 239b15). If the tortoise has a 10 meter lead on Achilles, and even if Achilles runs 10 times faster than the tortoise, he must first reach the point where the tortoise was, and since there is an infinite series of such points Achilles will never catch the tortoise because he must first reach an infinite number of points. But clearly Achilles will catch the tortoise. Given enough information a simple mathematical calculation will enable us to determine at what point the two will be tied, after which Achilles will take the lead. So has Achilles performed a super task?

The standard response to this question, beginning with Aristotle and continuing on through Peirce and beyond, is to say that of course Achilles did not actually have to do the impossible and reach an infinite number of points in the process of catching up to the tortoise. For Aristotle, what Zeno fails to recognize is that there is an important difference between the actual distance covered between any two points in a given finite amount of time and the potential for this distance or time to be subdivided to infinity. The actual is finite, not infinite, on Aristotle’s view, and the infinite is only the potential to continually divide the actual _ad infinitum_ but without actually ever reaching the infinite. Peirce will likewise agree with Aristotle that Achilles does not actually reach an infinite number of points in catching up with the tortoise, but this is for a significantly different reason.

Peirce counters Zeno’s paradox as follows:

All the arguments of Zeno depend on supposing that a _continuum_ has ultimate parts. But a continuum is precisely that, every part of which has parts, in the same sense. Hence he makes out his contradictions only by making a self-contradictory
supposition. In ordinary and mathematical language, we allow ourselves to speak of such parts—points—and whenever we are led into contradiction thereby, we have simply to express ourselves more accurately to resolve the difficulty.3

In short, we never reach points for they are simply tropes, manners of speaking, and what we might in everyday or mathematical language speak of as a point is itself composed of parts, parts that are in turn composed of parts, and so on ad infinitum.4 Zeno’s mistake was thus two-fold. First, Zeno failed to see that the continuum is irreducible to points, with points being merely abstractions from the continuum, and yet it was precisely the points reached along the way to catching the tortoise that did the heavy lifting in Zeno’s formulation of the paradox. The second mistake is to be confused by the usage of language. In both mathematical and ordinary language we will speak of points or parts, but in doing so Peirce claims we overlook the reality that is the continuum. If we are to avoid the contradictions that give rise to paradoxes such as Zeno’s, then for Peirce it is necessary to align our everyday and mathematical language with the ontological reality of the continuum.

Peirce’s diagnosis of what ails Zeno’s paradox brings us to an issue that will become a central concern of much of twentieth-century philosophy—namely, if unfounded problems such as Zeno’s are best resolved if we are able “to express ourselves more accurately,” then how do we go about achieving the desired accuracy? The history

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4 Contemporary analytic metaphysicians will use the term “gunk” when they refer to the (Peircean) position which asserts that everything has proper parts and that there are no basic elements. See, among many examples, John Hawthorne and Brian Weatherson, “Chopping Up Gunk,” The Monist 87:3, 339-350 and “Could extended objects be made out of simple parts? An argument for ‘atomless gunk’” Philosopohy and Phenomenological Research 56:1, 1-29.
of twentieth-century philosophy could be written from the perspective of the ongoing effort to establish a more accurate form of expression. Rudolf Carnap, for example, set out through his method of analysis (viz., Logical Positivism) to eliminate problems he took to be pseudo-problems if they could not be expressed in a logically correct form. In the process of doing this, Carnap eliminated metaphysics as well, which he took to consist of a series of problems that could not be formulated in a logically correct form. At the same time Heidgger was also concerned to clean up the inaccuracies that had come to be sedimented within our everyday language. Through a historico-grammatical analysis of language, Heidegger argued taht the presencing of Being itself had been both revealed and forgotten within and by everyday language and life. Carnap, ironically, singled out Heidegger as an example of a philosopher who toiled away with meaningless metaphysical problems, and yet despite this Carnap and Heidegger were both concerned, as Carnap himself recognized, with the same overarching problematic: how do we best achieve the goal of expressing ourselves more accurately? Needless to say, Peirce, the author of essays such as “How to make our ideas clear” and “Fixation of Belief,” is eminently concerned with this problematic as well.

There is a crucial difference between Peirce’s own approach toward establishing the conditions of expressing ourselves accurately and the methodologies that will come to dominate much of the work of twentieth-century philosophers. To state the contrast

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5 I could have begun here with Russell, and for a very obvious reason in that a tremendous amount of the developments in twentieth-century analytic philosophy were spawned in part by Russell’s recognition of fundamental paradoxes that threatened the consistency of set-theory.

6 For more on this, see Peter Gordon, Continental Divide (Cambridge, Mass.: Harvard University Press, 2010). Abe Stone has also shown how close Heidegger and Carnap were in their shared philosophical concerns regarding the responsible, accurate use of language. See “Heidegger and Carnap on the Overcoming of Metaphysics, in Martin Heidegger, edited by Stephen Mulhall (London: Ashgate, 2006).
baldly in order to set the stage for the arguments to follow, Peirce is much more willing
to draw upon the resources of pre-Kantian metaphysics, albeit while fully aware of the
Kantian critical project, and as a result Peirce is much less adverse to affirm a
metaphysics of the infinite than most of the philosophers who follow in his wake.
Deleuze will continue in this Peircean direction as he develops his own metaphysical
positions, what I will call infinite pragmatics.

II

The link between philosophy and the effort to clarify one’s expressions is as old
as philosophy itself. Consider a typical Socratic dialogue where an interlocutor is asked
to define their terms in a way that is non-contradictory and able to handle whatever
countercfactuals one might throw at them. A central assumption of this approach is that a
successful definition will admit of no exceptions, or that it will be a truly universal
definition that is capable of capturing what is, without exception, essential to the theme
being discussed (e.g., ‘piety’ in the Euthyphro, ‘justice’ in the Republic, etc.). Frege’s
understanding of concepts works off this same assumption. A concept, Frege argues,
must clearly and distinctly demarcate what is or is not included within its range. As Frege
puts it, “It must be determinate for every object whether it falls under a concept or not; a
concept word which does not meet this requirement on its Bedeutung is bedeutsungslos.”
Frege could not be clearer: if it is not determinate whether or not a given object falls
under a concept, then the concept itself is meaningless (bedeutsungslos). This is not to say
that such concepts lack sense (or intension as it is also called) for in the case of fiction,

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7 Gottlob Frege, “Comments on Sinn and Bedeutung,” in The Frege Reader, edited by Michael Beaney
Frege notes, various concepts may be used and make sense but “for fiction,” Frege argues, “sense is enough” since it “is devoid of Bedeutung, of truth-value.” In other words, such concepts lack an extension that will provide a truth-value and hence they may be good enough for literature but not for science.\(^8\)

It is the distinction between intension and extension that is most important for Frege—that is, there is a difference between sense and meaning understood broadly and the sense of scientific propositions, or of propositions with truth-values as their referent (bedeutung). While what one reads in a Homeric tale may make perfect sense, they are not scientific statements unless we know that they have a possible extension that can provide a truth-value to the statement. Without getting into the enormous literature associated with the debates regarding the intension and extension of propositions, I want to highlight the problem of the infinite that is associated with grasping the extension of a concept.\(^9\) To state the problem differently, does grasping a concept and its corresponding extension entail performing a supertask?

David Hume was already aware of this problem, and hence it is appropriate to turn now to Hume’s solution to the problem, and for two primary reasons. First, Hume offers what might be called the pragmatist solution to the problem, which then sets the stage for Peirce’s own approach. A second reason is that it was through his early engagement with Hume’s thought that Deleuze developed the transcendental empiricism that would remain

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\(^8\) Ibid.

\(^9\) David Chalmers’ recent work in 2D semantics is just one place to look to see how this distinction is alive and well among contemporary philosophers.
a recurrent theme throughout Deleuze’s career. Hume will thus serve as a bridge we can cross to better appreciate the influence of Peircean pragmatism on Deleuze’s thought.

A key problem for Hume is that he does not take abstract ideas and concepts as the unquestioned givens on the basis of which we then solve problems; abstract ideas and concepts are precisely the problem. Let us take the concept blue. Given Frege’s theory, to understand the concept blue will entail being able to determine what objects are or are not blue. On the basis of this concept, one can identify a particular object or shade of color as blue. This is not how it works according to Hume, which becomes clear early on in the Treatise when he proposes the idea of a missing shade of blue. As Hume presents the example, we are to imagine that someone is presented with a series of shades of blue with a gap where a particular shade they have never experienced would be. Could we have an idea of what color would fill in this gap? Hume has no doubt that we could, but this would appear to violate Hume’s copy principle that every idea is reducible to being a copy of an impression. Hume, however, dismisses the example as being “so particular and singular, that ‘tis scarce worth our observing, and does not merit that for it alone we should alter our general maxim.” (T 1.1.1.6).

What is going on here? Hume’s intuition that we would be able to fill in the gap certainly seems to be correct, but then what is the difference between this case and those of a blind man who “can form no notion of colours [or] a deaf man of sound.” Hume gives these examples in his Enquiry and here, as in the Treatise, he offers the example of the missing

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10 Transcendental empiricism is a prominent theme in Deleuze’s final publication, “Immanence: a life.” For more on this, see my Deleuze’s Hume (Edinburgh: Edinburgh University Press, 2009).
11 Enquiry
shade of blue, only to dismiss it yet again. The difference, I would argue, is that the blind man cannot form the abstract idea or concept of color, much less the abstract idea of the color blue, whereas one can provide the missing shade of blue precisely when and if they possesses the abstract idea of blue. What acquiring this abstract idea involves Hume clarifies in 1.1.7 (“Of abstract ideas”). In particular, an abstract idea is *neither* an idea that is abstracted from all the qualities and properties of the particulars such that the idea becomes the idea of nothing in particular. The abstract idea is an idea with determinate content. *Nor* is an abstract idea the synthesis of *all* the qualities and quantities of the particulars that could possibly fall under the abstract idea, for this would entail, Hume argues, “an infinite capacity in the mind…” (1.1.7.) In other words, if to grasp an abstract idea involved successfully knowing all that could possibly fall under idea then it would entail a supertask, which for Hume is impossible. To resolve the apparent dilemma, Hume argues that an abstract idea reflects a customary association of resembling impressions – e.g., deep blue resembles powder blue resembles baby blue, etc. – so that when an abstract idea is brought to mind it “revives that custom” or habit whereby we can move from one instance of the abstract idea to another—we can move from deep blue to powder blue, and so on indeterminately (though not *ad infinitum*). This custom or habit is not, however, precise in the Fregean sense, and thus it does not enable us to differentiate, unequivocally, what does or does not fall under the concept. As Hume argues, “The application of ideas beyond their nature [namely, beyond their nature as copies of impressions] proceeds from our collecting all their possible degrees of quantity and quality *in such an imperfect manner as may serve the purposes of life…” (1.1.7.12, emphasis mine). It is this anexact power of custom that enables one to formulate the idea
of the missing shade of blue – one has the power to compare and triangulate and thereby create the idea of the missing shade by virtue of the grasp one has of the abstract idea. Such an anexact power is part and parcel of the powers that serve the purposes of life and thus it is no wonder Hume dismissed the case of the missing shade of blue as “singular” and “scarce worth our observing.”

Hume’s pragmatic solution to the problem of supertasks will be followed to a great extent by Peirce as he develops his pragmatism (or pragmaticism as he strategically referred to it). Before turning to Peirce’s treatment of what we have called the problem of supertasks, and then to Deleuze’s extension of Peirce’s project, there is one other philosopher whose response to the problem of supertasks must not be overlooked—namely, Kant’s.

III

The impossibility of completing a supertask is at the heart of Kant’s first antinomy of pure reason. In addressing the question of whether the world does or does not have a beginning in time, Kant argues that if one assumes it does not then “an eternity has elapsed, and there has passed away in the world an infinite series of successive states of things,” but since an infinite series “can never be completed through successive synthesis [it] follows that it is impossible for an infinite world series to have passed away.”

Because a supertask is impossible, the world must have a beginning in time. If, however,

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12 See… Peirce preferred pragmaticism over pragmatism owing to the fact that, as he put it, “…” Unfortunately for Peirce, subsequent generations of philosophers opted for the more aesthetically pleasing term.

13 *Critique of Pure Reason*, p. 397
we assume the world has a beginning in time then the world proceeds from a “time in which the world was not, i.e. an empty time.” An empty time, however, lacks any determinate content and thus it lacks any “distinguishing condition of existence rather than non-existence.” There is thus no way to think a world that begins in time for this would involve a thought without content, which for Kant is another impossible task (although not a supertask in this case for rather than an infinite successive series of content to be synthesized we have no content, and hence no thought).

Kant’s solution to the antinomy is straightforward—he rejects the very notion that the world exists in-itself as either a finite or infinite totality. One cannot have a thought or belief in this world therefore for it does not, in the end, exist, and to claim otherwise is to suffer from an illusion—what Kant calls a transcendental illusion. Kant is clear on this point:

If we regard the two propositions, that the world is infinite in magnitude and that it is finite in magnitude, as contradictory opposites, we are assuming that the world, the complete series of appearances, is a thing in itself that remains even if I suspend the infinite regress in the series of its appearances. If, however, I reject this assumption, or rather this accompanying transcendental illusion, and deny that the world is a thing in itself, the contradictory opposition of the two assertions is converted into a merely dialectical opposition. Since the world does not exist in itself, independent of the regressive series of my representations, it exists in itself neither as an infinite whole nor as a finite whole. It exists only in the empirical regress of the series of appearances, and is not to be met with as something in itself.14

Kant’s argument, in essence, largely repeats Aristotle’s response to Zeno’s paradox. As we investigate the conditions of empirical phenomena, we launch upon a regress in that “however far we may have advanced in the ascending series [of

14 Ibid., pp. 447-448.
conditions], we must always enquire for a still higher member of the series, which may or may not become known to us through experience.”\textsuperscript{15} The question then is whether the world is what we get at the end of an infinite series, at the end of the supertask, or whether we must remain content with the empirical regress of forever advancing through an unending series of conditions. In rejecting the possibility of supertasks, Kant rejects the existence of a world in itself and as a result we do not have a regress to infinity but rather a “regress in the series of appearances, as a determination of the magnitude of the world, [that] proceeds \textit{in definitum}.”\textsuperscript{16} The regress is therefore neither an infinite regress nor a finite regress but is instead an indeterminate process of determining, in accordance with a rule, “how experience, in conformity with its object, is to be obtained and further extended.”\textsuperscript{17}

IV

We can now return to Peirce. In his 1868 essay “Questions Concerning Certain Faculties Claimed for Man,” one of a series of articles for the \textit{Journal of Speculative Philosophy} (also known as the “cognition series”), Peirce will examine a number of incapacities that philosophers had traditionally taken to be capacities. I will focus on the first such capacity, our ability to distinguish on the one hand between an intuition that is primitive, unquestioned given that is not determined by any previous thoughts or cognitions, such as past experiences, education, habituation, etc. and on the other hand a cognition that always is, according to Peirce, determined by previous cognitions. An intuition, Peirce argues, serves as the premise upon which a chain of thoughts and cognitions can be

\textsuperscript{15} Ibid. 455.
\textsuperscript{16} Ibid. 457
\textsuperscript{17} Ibid.
founded, and many would like to believe they can accurately distinguish between premises and the arguments that are grounded upon them. For Peirce, however, this is not a capacity we have. Peirce offers the example of eleventh-century theologian Berengarius to make his point. Berengarius had the audacity to suggest that “the authoritativeness of any particular authority must rest upon reason.” (W 2:194). Berengarius’s contemporaries thought such a suggestion was absurd and impious. Peirce thus concludes: “the credibility of authority was regarded by men of that time simply as an ultimate premise, as a cognition not determined by a previous cognition of the same object, or, in our terms, as an intuition.” (ibid. 194-5). The lesson Peirce draws from this example is that what we take to be intuitive today—namely, the data of sense intuition, what Peirce will call “internal authority”—may tomorrow come to be seen as cognitions rather than intuitions. Peirce thus asks, rhetorically: “Now, what if our internal authority should meet the same fate, in the history of opinions, as that external authority has met?” (ibid. 195).

The next question for Peirce, and with this Peirce’s concerns dovetail with Kant’s, is whether it is even possible for there to be an intuition at all or whether all cognitions are determined by other cognitions, and so on ad infinitum. The short answer for Peirce is no—all cognitions are determined by previous cognitions. To support this claim, Peirce relies upon the principle of sufficient reason. First, Peirce argues that it is problematic to argue “For something entirely out of consciousness which may be supposed to determine it [consciousness], [but] can, as such, only be known and only adduced in the determinate cognition in question.” (ibid. 209). In other words, in the tradition of Berkeley, to think the condition that is outside all thought and cognition is to think this condition, and hence
we have not made the case for a cognition that is not determined by another cognition. If we persist, however, and argue for a condition that is “absolutely external,” as Peirce puts it, meaning beyond any thought, then such a condition becomes inexplicable for in order for an explanation to be successful it would entail being recognized and understood as such—in short, it will involve cognition. To rely upon the inexplicable as a means to explain cognition is thus contradictory. Peirce’s conclusion therefore—all cognitions are determined by previous cognitions.

At this point a clear contrast between Peirce and Kant emerges. For Kant the supertask of synthesizing an infinite series of representations—or in Peirce’s terminology, points—is impossible, and any conclusions that rely upon such a task is to be rejected and chalked up as being illusory. For Peirce, on the contrary, the real itself is the supertask, or the continuum as processual unfolding that is the condition for the possibility of the successive points and representations that are derivative abstractions conditioned by, rather than conditions for, the continuous reality. Let me refer to two brief examples from Peirce where this point becomes clear. In the first, again from the 1868 essay I have been discussing, Peirce compares the successive chain of thoughts to an inverted triangle. As we dip this triangle into the water, the waterline on the triangle is a cognition, and as we move the triangle up and down we have further cognitions, each one being determined by the movement from the previous one. The triangle, however, does not contact the water at a point, for every point, to recall our earlier discussion, can be further divided, or in this case each line has a smaller segment below it. For Peirce then we either have cognitions—waterlines on the triangle—or the triangle is out of the water and we have no
cognitions at all. Reality simply is the infinite continuum of the triangle on Peirce’s understanding of the analogy.

The second example comes from Peirce’s late essay, “Synechism, Fallibilism, and Evolution,” and it does not rely upon an analogy. In this essay Peirce rejects the exclusive disjunction between existence and non-existence, and argues that “all things are continuous, [and that] the universe must be undergoing continuous growth from non-existence to existence. There is no difficulty in conceiving existence as a matter of degree.”  

There is thus for Peirce no determinate fixed points of existence—reality itself is simply the process of becoming more and more existent. Reality itself is a supertask, a process that always already presupposes the infinite continuum, but just not an infinite continuum of extensive points which Peirce argues, as we have seen, is contradictory. Even the laws of nature, Peirce claims, “are results of evolution; that underlying all other laws is the only tendency which can grow by its own virtue, the tendency of all things to take habits.”  

It is this tendency, in short, this continual process of settling into habits, that is the principle of sufficient reason for all that appears, for all determinate, particular phenomena. For Peirce then, unlike Kant, he believes in the world, and this is an infinite world or infinite continuum. It is only when we come to think of the world in terms that reduce it to the discrete—e.g., the synthesis of discrete representations for Kant or the discrete points Achilles reaches on the way to catching the tortoise—that we then encounter problems. Peirce thus affirms the infinite world, but he does so at the expense of the discrete and the singular. In his effort to develop what we could see as Peircean

18 In Philosophical Writings of Peirce, p. 358.
19 Ibid. 359
pragmatism, Deleuze will likewise affirm an infinite world but this will be a world teeming with singularities, singularities that are not extensive and hence discrete. It is to this that we now turn.

V

As we turn to Deleuze the clearest way to summarize where we have been and where we are going is as follows: in the wake of various paradoxes associated with the infinite, Aristotle and Kant reject the actually infinite and take refuge in the potentially infinite (the *in indefinitum* for Kant); Peirce affirms the infinite world as a continuum of “growth from non-existence to existence,” though not a world that is actually infinite and a world where the discrete and particular become derivative abstractions; and Deleuze, finally, affirms the infinite world as actually infinite, and a world teeming with what he will call pre-individual singularities. It is this radical affirmation of the infinite that accounts for why the infinite looms so large in the definitions of two of Deleuze and Guattari’s key concepts from *What is Philosophy?* Given that Deleuze and Guattari’s answer to the question, “what is philosophy?” is that it creates concepts—“philosophy is the art of forming, inventing, and fabricating concepts”—the subsequent question is what is a concept? Deleuze and Guattari are forthright with their answer: “The concept is defined by the inseparability of a finite number of heterogeneous components traversed by a point of absolute survey at infinite speed.” Later they will define chaos, another concept that does tremendous work in *What is Philosophy?* in similar terms: “chaos is characterized less by the absence of determination than by the infinite speed with which

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20 *What is Philosophy?* p. 2.
21 *What is Philosophy?* p. 21 (emphasis mine).
they take shape and vanish.”\textsuperscript{22} It is with the affirmation of the infinite in hand that Deleuze and Guattari set out to differentiate philosophy from science, and from the philosophy that aligns itself with science (as was Frege’s aspiration as we saw) by arguing that “the problem of philosophy is to acquire a consistency without losing the infinite” whereas “the problem of science…[is] to provide chaos with reference points, on condition of renouncing infinite movements and speeds and carrying out a limitation of speed first of all. Light, or the relative horizon, is primary in science.”\textsuperscript{23} To understand what Deleuze and Guattari mean by infinite speeds and movements it is critical to reorient one’s philosophical perspective away from the Kantian critical tradition and extend Perice’s project in order to embrace the actual infinite. One way to state this reorientation is to characterize it as the effort to restore belief in the world, a belief Kant sought, as we saw, to render impossible.

This effort to maintain belief in the world, with all that this entails, is a central issue in Deleuze and Guattari’s \textit{What is Philosophy}? As they put it: “It may be that believing in this world, in this life, becomes our most difficult task, or the task of a mode of existence still to be discovered on our plane of immanence today.”\textsuperscript{24} In attempting this task, moreover, one likewise attempts to address the problem of supertasks for in creating concepts one is in effect creating something with infinite speeds and thus, unlike in science, a philosopher’s task is to affirm the actually infinite rather than to restrict the infinite and place it within its proper limits (e.g., speed of light). To do this, however, Deleuze and Deleuze and Guattari seek to find a middle path between affirming infinities

\textsuperscript{22} Ibid. 42
\textsuperscript{23} Ibid.
\textsuperscript{24} What is Philosophy? 75
that are determinate—whether this be the world as a determinate, infinite totality or constituted of actually infinite and extensive parts—and they likewise want to avoid the Peircean conclusion that all is continuum, that every determinate, extensive entity is further divisible into parts and so on *ad infinitum* (the “gunky” view of matter in contemporary analytic metaphysics [see fn. 4]). The reason for steering clear of the continuum is in order to affirm the reality of differences, and for the extensive determinations such differences make possible. In the case of Peirce, difference is ultimately subsumed by the identity of the continuum, and by the Truth and opinion fated to be agreed to by all.\(^{25}\) For Deleuze and Guattari, the world is indeed between these two alternatives and we can adopt José Benardete’s argument from his excellent though largely overlooked book, *Infinity: an essay on metaphysics*. A central thesis of this book, besides affirming the actually infinite, is that “there [is] perhaps some tertium quid that would enable us to eschew both the minim [basic elements] and the continuum [atomless gunk] at once?”\(^{26}\) In the case of Deleuze and Guattari this *tertium quid* is the world as chaotic.

To avoid the Kantian rejection of the belief in the world, Deleuze turns to the pre-Kantian tradition, most notably Spinoza and Leibniz. From Leibniz Deleuze adopts the concept of differential relations as infinitesimals. In the differential relation \(dy/dx\), for example, as \(y\) and \(x\) become infinitely small we end up with \(dy=0\) and \(dx=0\) (or \(dy/dx = 0/0\) as it was commonly written in the seventeenth and eighteenth centuries). As \(x\) and \(y\)

\(^{25}\) For Peirce’s discussion of Truth as the opinion we are all fated to hold, see Philosophical Writings, p. 288: “That is to say, I hold that truth’s independence of individual opinions is due (so far as there is any ‘truth’) to its being the predestined result to which sufficient inquiry would ultimately lead.”

become infinitely small we end up doing away with the terms but not the differential relation, for the relation subsists as the infinite, intensive supertask even when the terms have been eliminated, or, as Deleuze will frequently put it, the relation is external to the terms. These differential relations are precisely Benardete’s tertium quid, for they are not extensive—the extensive terms have vanished—nor are they absorbed into the continuum for the determinable relation subsists as an irreducible relation (it cannot be further reduced into parts, and parts of parts, etc.).

Differential relations are integral to Deleuze’s concept of multiplicity for differential relations are not isolated relations but presuppose other relations, and so on ad infinitum. For example, in the differential relation dy/dx, as the determinate values for x and y become infinitely small we end up without the determinate terms but rather with a differential relation (or what Deleuze will call an intensive difference) that is external to the terms and tends toward a third term that is its limit, a term that does have a finite value, z let us say. Thus, dy/dx = z as x and y become infinitely small. Z may be, for example, the trigonometric tangent on a circle. Every determinate, finite term, therefore, can be understood as the limit of a differential relation—this is the sense in which Deleuze understands the differential relation to be constitutive of identity rather than dependent upon identity, and it is thus in line with his effort to develop a philosophy of difference that does not think difference in terms of identity, as the difference between

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27 Daniel Smith has highlighted this aspect of Deleuze’s work as well. In his essay, “The Conditions of the New,” in Essays on Deleuze (Edinburgh: Edinburgh University Press, 2012) he argues, in the context of arguing that for Spinoza “simple bodies are actually infinite…[that] The formula of the actually infinite, however, is neither finite nor indefinite. On the one hand, it says that there are indeed ultimate or final terms that can no longer be divided—thus it is against the indefinite; but on the other hand, it says that these ultimate terms go to infinity—thus they are not atoms but rather terms that are ‘infinitely small’, or as Newton would say ‘vanishing terms’.” 249

28 I borrow this example from Smith, ibid. 246.
terms for instance, but rather think difference in itself and as the condition for identity. This will be true of the determinate terms of our initial relation, dy/dx, where y and x will themselves be the third term of its own constitutive differential relation, a differential relation with its own determinate terms and its own series of constitutive differential relations, and so on ad infinitum. This is precisely how Deleuze defines intensive difference, or difference properly understood, in *Difference and Repetition*, and it is this difference that is the PSR for all phenomena, meaning all determinate, extensive phenomena:

Every phenomenon is composite because not only are the two series which bound it heterogeneous but each is itself composed of heterogeneous terms, subtended by heterogeneous series which form so many sub-phenomena. The expression ‘difference of intensity’ is a tautology. Intensity is the form of difference in so far as this is the reason of the sensible. Every intensity is differential, by itself a difference. Every intensity E- E’, where E itself refers to an e – e’, and e to ε – ε’ etc. …We call this state of infinitely doubled difference which resonates to infinity disparity. Disparity – in other words, difference or intensity (difference of intensity) – is the sufficient reason of all phenomena, the condition of that which appears.29

To rephrase for the sake of clarity and to bring us to the concept of a multiplicity, each differential relation is the constitutive condition for “every phenomenon,” meaning every determinate, identifiable phenomenon (“that which appears”). Each phenomenon presupposes an infinite series as its sufficient reason and each phenomenon is itself in an infinite series of differential relations with other phenomena, and this for precisely the reason that an infinitely doubled series—disparity—is the sufficient reason of all phenomena. If a given phenomenon were to be incapable of entering into relations with other phenomena, then we would have an end to the series—the series would end with

29 *Difference and Repetition*, 222.
this phenomenon and hence be a finite series; and it is this conclusion that Deleuze
rejects. Every phenomenon is thus, Deleuze argues, echoing Leibniz’s theory of monads,
related to every other phenomenon, and infinitely so.  

We thus come to the conclusion for Deleuze that every differential relation is in
relation with other relations, and so on *ad infinitum*. From here we come to Deleuze’s
concept of multiplicity. As Deleuze argued, and for reason just laid out, “every
phenomenon is composite.” More to the point, every phenomena is a composite
substance of differential relations, a composite of differential relations that presupposes
difference or intensity (disparity) as its sufficient reason. It should also be clear by now
that we do not have one substance or even a plurality of substances. What is key to the
differential relations that compose substance is that they are intensive differences and are
thus not to be confused with extensive differences—the differences between terms for
example—and thus a differential relation is not to be identified with a specifiable
difference, with a determinate cut that separates one thing from another. It is for precisely
this reason that Deleuze will refer to intensive differences as pre-individual singularities,
for they are the constitutive differences, as we saw, of determinate identities (the third
term) but are not to be confused with these identities—they are intensive relations
external to their terms. As a result, the differential relations that compose substance are
irreducible to basic entities, although they are fully differentiated in that each differential
relation or singularity is irreducible to other singularities—the differential relation dy/dx,
as discussed earlier, maintains its irreducible relation even after the terms have

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30 See Leibniz, *Monadology* §56: “Now this connexion or adaptation of all created things to each and of
each to all, means that each simple substance has relations which express all the others, and, consequently,
that it is a perpetual living mirror of the universe.”
disappeared. We thus avoid both atomism in that the differential relations are not an extensive and finite minim, they are, rather, intensive differences that presuppose as their principle of sufficient reason an infinite series of differential relations. At the same time the differential relations that compose substance do not compose a single or unitary substance for this too relies upon an extensive mode of individuation—it calls upon the numerical identity of the determinate, already individuated entity or whole when the substance of differential relations is the very constitutive condition for the possibility of such countably determinate entities. It is, finally, multiplicity that is the substance which is composed of a series of differential relations. Deleuze’s clearest and most forceful definition of multiplicity as metaphysical substance is offered in *Difference and Repetition*:

> ‘Multiplicity’, which replaces the one no less than the multiple, is the true substantive, substance itself…Everything is a multiplicity in so far as it incarnates an Idea. Even the many is a multiplicity; even the one is a multiplicity. Everywhere the differences between multiplicities and the differences within multiplicities replace schematic and crude oppositions. Instead of the enormous opposition between the one and the many, there is only the variety of multiplicity – in other words, difference.  

We can find surprising support for Deleuze’s metaphysics of multiplicity in Mark Wilson’s essay “Theory Façades,” and in his subsequent book *Wandering Significance*. Mark Wilson provides numerous examples, replete with dizzying detail, to argue that throughout the sciences one finds that in the effort to provide descriptive traction one will apply “sheets of doctrine that do not truly cohere into unified doctrine in their own

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31 Difference and Repetition, p.182.
What may work well at one level and scale may begin to fail at a more detailed and enhanced level of description. As Wilson puts this in *Wandering Significance*,

…as our everyday descriptive terms become pressed to higher standards of accuracy or performance, as commonly occurs within industry or science, a finer and more perplexing grain of conflicting opinion begins to display itself within our applications of “hardness,” “force” and even “red.” (p. 7)

Put in Deleuzian terms, the effort to produce accurate descriptions of phenomena encounters, with the increasing demands of more detailed and nuanced analysis, the substantive multiplicity that is the sufficient reason for the phenomena being described. In other words, in our effort to “express ourselves more accurately” as Peirce called for, the effort, as with all that appears, presupposes substantive multiplicity as the principle of sufficient reason. The result is a wandering of significance, or an inherent disparity between our descriptions of extensive properties and relations and the intensive differences that made these properties and relations possible. This disparity becomes evident as the descriptive terms being used get pushed towards an increasing particularity of detail; in short, as they get pushed toward substantive multiplicity. What happens as a result, Wilson argues, is that we often find it easier “to decompose the system’s overall behavior into descriptive fragments where the intractable complexities of the full problem become locally reduced to more tractable terms.” (TF pp. 273–4). As an example Wilson offers the mathematical description of the formation of spray on “the surface of a choppy ocean.”32 If the ocean is modeled as a continuous fluid, the partial differential equations will provide accurate descriptions to a point, but then it fails to track the phenomena for the equations will continue “to plot an attached blob that never relinquishes its absurdly

32 *Wandering Significance*, . 210 (subsequent quotes are from this page)
elongated umbilical tie to the mother ocean.” To offset this poor description, one solution is to run the model with an already detached blob that then separates from the ocean. This provides for a good description where the continuous model failed, but then the description is poor where the continuous model was good. If we combine the two models, we can overlap them such that it provides a good description of the entire process. While this may provide an accurate description, Wilson argues that what is going on here is “physics avoidance in that we do not directly describe the molecular processes that lead to drop separation, but merely cover the relevant region with an interpolating patch.” In other words, there is a repressed difference or boundary that is then avoided in the supposed unified account. Wilson is not arguing that no account of water separation is possible. His argument is that an adequate account of the boundary where the different patches converge may well entail a complex mathematics beyond our ken at this point. As a result, and due largely to impatience, or for the purposes of life as Hume might put it, we are often tempted “to pretend as if our façade patchwork provides a wholly adequate descriptive framework solely on its own terms…” (TF 275).

Such patchworks are necessary, I would argue, not simply because of human impatience and the failure to follow the contours of reality carefully enough, or because of solely practical concerns for the necessities of life, but rather because of the fact that substantive multiplicity is the principle of sufficient reason for all that appears, for all that we attempt to describe accurately. Wilson appears to acknowledge as much when he states the central thesis of his book:
The main consideration that drives the argument of the book is the thesis that the often quirky behaviors of ordinary descriptive predicates derive, not merely from controllable human inattention or carelessness, but from a basic unwillingness of the physical universe to sit still while we frame its descriptive picture. (WS 11)

Conclusion

With Wilson’s recognition of the “basic unwillingness of the physical universe to sit still while we frame its descriptive picture,” we return to where we began. In confronting the paradoxes of the infinite the most common strategy was simply to reject the possibility of the actually infinite. Achilles does not actually reach an infinite number of points in catching the tortoise; one does not actually complete the supertask of placing and removing the apple from the table an infinite number of times. With Peirce, however, the continuum that is the tendency and process of reality itself to settle into habits is indeed actually infinite and we only encounter the paradoxes when we attempt to understand this nature of the infinite continuum by way of ultimate, irreducible points and particulars, when these themselves are constituted of parts, parts with their own parts, and so on ad infinitum. (i.e., parts and parts of parts, etc.). For Peirce, however, the affirmation of the actually infinite is itself placed within relation to the limit that is the Truth or opinion all are fated to settle upon at the end of the road of inquiry. Deleuze, by contrast, affirms the actually infinite, much as José Benardete before him did, and this is an infinite that is not held in abeyance to the truth, but an infinite that is a metastable state or chaos irreducible to the extensive properties and qualities that make which propositions possible. In contrast to the infinite convergent series where one can be lulled into the belief that the series does indeed converge at the limit, the divergent infinite series of placing and removing the apple does not converge on the apple being either on the table or not, nor
does it converge upon an ultimate stability and Truth as with Peirce, but it instead remains undecidable, or metastable (to use Simondon’s term). It is precisely the metastability and chaos of reality that is the actually infinite, according to Deleuze, and it is this reality that is the principle of sufficient reason, as we have seen, for all that appears. Deleuze’s Peircean pragmatism does indeed follow in the tradition of Peirce’s metaphysics by placing the infinite at the heart of reality, but rather than affirm the infinite cosmos as Perice does, Deleuze (and Deleuze and Guattari) affirms the infinite chaosmos.