

Structure

Journal of Metaphysics and Ontology

Volume 2 (2022)

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Journal of Metaphysics and Ontology

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Note from the Editors

We are pleased to bring you this second edition of our undergraduate journal, *Structure*. After a great success last year, we continue to aspire to publish quality work in metaphysics and ontology, which we loosely define as the study of reality and being respectively. This year, we are happy to present two excellent papers from undergraduates at two different institutions on the East Coast. The first paper, from Jaden Jarmel-Schneider at Columbia University, concerns Kant's first antinomy, and the second paper, from Bangrui (Christoph) Chen at the University of Pittsburgh, concerns the famous 'river fragments' of Heraclitus.

We are especially grateful for those who volunteered to participate in the blind review for this journal: a smaller team this year. Thank you to Jake Beardsley and Evelyn Wang for all your help with the process. We would also like to thank the entire Philosophy Department at William & Mary for their continued support and encouragement of this journal.

Sincerely,

Gaelan DiPaola & Jared Jones

The Misapplication of Infinity in the First Antinomy

By Jaden Jarmel-Schneider

Bio

Jaden is a recent graduate of Columbia University where he studied Philosophy and Mathematics. Exposed to metaphysics and epistemology first through the *Critique of Pure Reason*, Jaden's interests have since mainly followed Kant. He is interested in both Kant's rejection of Leibnizian Rationalism as a study in "transcendental psychology" (an idea pioneered by Patricia Kitcher who advised this paper) as well as the role of Kant in modern intellectual history. More recently, he has become interested in interpretations of Kant in 20th century social philosophy. His most recent work investigates György Lukacs' Marxist critique of Kant's epistemology.

Introduction

In the thesis of the First Antinomy, Kant writes about the totality of appearances that the “infinity of the sequence consists precisely in the fact that it can never be completed by successive synthesis. Therefore an infinite bygone world sequence is impossible, and hence a beginning of the world is a necessary condition of the world’s existence.”¹ The argument, made to prove the existence of a beginning of the world, makes a leap between the ‘unsynthesizability’ of an infinite sequence and the impossibility of a real infinite sequence. The argumentative leap is interesting, epistemologically, ontologically, metaphysically, and a crucial one for Kant’s mission in the First Antinomy. Without it, the argument for the beginning of the world falls through and so too does the antinomial proof in its entirety. Many interpretations have been proposed to save Kant from that fate. A successful interpretation would need to describe how a Transcendental Realist could extrapolate from experience the nature of space and time as totalities. There is no such salvation for Kant. With reference to Paul Benacerraf’s *Tasks, Super-Tasks, and the Modern Eleatics*, I will argue that Kant’s argument in the first antinomy relies on an epistemological and conceptual error relating to infinities and that, as a result, the thesis of the first antinomy, and the antinomial conflict as a whole, is unsound. The first part of this paper will describe the modal and argumentative context needed to evaluate the validity of this leap, and the second part of the paper will argue that to the Transcendental Realist, Kant, and the modern reader, it is an unsound leap. Lastly, I will offer a new interpretation of Kant’s notion of infinity.

It is first important to note that Kant’s goal in the First Antinomy is to criticize what he saw as the haphazard metaphysics of his predecessors. Specifically, the First Antinomy was meant to reject Rationalism which held that (1) we could understand the whole world, and that (2) the world conforms to our cognition such that it is intelligible to us. To achieve this, Kant wrote the First Antinomy under the guise of Transcendental Realism. We can think of Kant as “assuming” Transcendental Realism in

¹ Kant, Pluhar, & Kitcher, 1997, A426/B454

the proof, as one would in a *reductio*, then showing contradiction by proving the validity of both the thesis and antithesis positions. While there are distinctions between Rationalism and Transcendental Realism, we can think of Transcendental Realism as a position which adopts the tenets of Rationalism which Kant hopes to reject: the Transcendental Realist, like the Rationalist, asserts that facts about reality *can* be known, that appearances allow us to make claims about real objects.

Kant's mission is most visible from the fact that the First Antinomy responds to an erroneous syllogism he attributes to 18th-century Rationalists. The *dialectic syllogism*, as Kant coins it, can be formalized as followed:

P1: If the conditioned is given, then the whole sequence of conditions, a sequence which is therefore itself absolutely unconditioned, is also given.

P2: Objects of the senses are given as conditioned.

Conclusion: Consequently, the entire sequence of all conditions of objects of the senses is already given.²³

The syllogism's fundamental error for Kant is the ambiguity of the "unconditioned." The "unconditioned" should be understood as the element in a sequence which has no condition underlying it. When applied to the sensible world, as Kant does in the First Antinomy, the dialectic syllogism deals with the totality of appearances as understood through the forms of intuition: space and time. As Henry Allison argues, reason attempts to understand the unconditioned sequence of sensible appearances in one of two ways, as having an unconditioned first element or as having an infinite number of elements.⁴ This reading is suggested by Kant's remarks at A478-79/B506-O7:

One can think of this unconditioned in two ways... In the first case the sequence is *a parte priori* given without bounds (without beginning), i.e. infinitely, and yet wholly; but the regression in it is never completed and can be called infinite only potentially. In the second case there is a first member of the sequence, which is called: with regard to bygone time, the *beginning of the world*; with regard to space, the *boundary of the world*.

The syllogism then yields, to human reason, that the sensible world, represented through the intuitions of space and time, must have either a first beginning or extend infinitely into the past. The Transcendental Realist's mind assumes that because it can think of a totality in only these two ways, that the sequence must really exist in one of those ways.⁵ This interpretation produces the two-sided nature of the First Antinomy. It is precisely because reason produces this interpretation that Kant writes the First Antinomy (and, similarly, the other three) as a dialectic with a thesis position—that

² Adopted from Henry Allison's construction in *Kant's Transcendental Idealism*, p. 361

³ Kant, Pluhar, & Kitcher, 1997, A497/B525

⁴ Allison, Henry, 1983, 359

⁵ Wood, Allen, 2010, 250

the world has a beginning—and antithesis position—that the world extends infinitely. Kant will proceed to prove both positions, and their mutual validity is the antinomial conflict.

To further muddy the waters, while the Antinomy in its entirety operates like a *reductio ad absurdum* to show a contradiction in a philosophy that the *Critique* hopes to reject, the thesis and antithesis positions are written as embedded *reductio* proofs in the larger proof. In the thesis, Kant assumes, towards contradiction, that the world has no beginning in time. It follows that for each moment in time, another moment precedes it. But, he writes, the “infinity of the sequence consists precisely in the fact that it can never be completed by successive synthesis. Therefore an infinite bygone world sequence is impossible, and hence a beginning of the world is a necessary condition of the world’s existence.” For the purposes of this paper, I will call this proposition in the thesis—that the ‘unsynthesizability’ of the infinite sequence of appearances implies a beginning of the world— Φ . The argument for bounded space proceeds similarly, concluding that because infinite quantum of space cannot be completed through successive synthesis, an infinite world cannot exist, so the world must be bounded.

The guiding question for this paper becomes: what views does Kant attribute to the Transcendental Realist that allow him to justify the gap at the center of Φ —that is, the gap between the “unsynthesizability” of an infinite sequence and the impossibility of such a sequence existing in reality. An important follow-up question is: how does Kant conclude that an infinity is unsynthesizable? The proof structure of the First Antinomy makes it challenging to answer questions like this, but Allen Wood traces Kant’s usage of infinity to Aristotle in the *Physics*—something is infinite if it cannot be traversed or completed.⁶ A useful corollary being that the past is that which has been traversed and completed. This is a compelling reading because it mirrors Kant’s language in the First Antinomy, where he writes that “the infinity of a sequence exists precisely in the fact that it can never be completed by successive synthesis” (my italics).⁷ This is, Kant says, “the true (transcendental) concept of infinity.”⁸ In other words, even given infinite “time” (in quotations because Kant would oppose understanding the notion of infinity using one of the intuitions), an infinite sequence would never be completed. The answer to this first preliminary question is, then, that infinities are analytically unsynthesizable. The lack of a justification for this definitional assumption is an issue this paper will later explore.

The second, more challenging question relating to Φ is about Kant’s notion of possibility in the context of the First Antinomy. Part of Kant’s general critique of Leibnizian Rationalism was its conflation of logical and real possibility. For Kant, there was an important distinction between logical and real possibility. As he writes in his 1762 *The Only Possible Basis for a Demonstration of the Existence of God* that “in every possibility there must be distinguished *the thing which is thought* and *the agreement of that*

⁶ Ibid., 252

⁷ Kant, Pluhar & Kitcher, 1997, A426/B454

⁸ Ibid., A432/B460

which is thought in it with the principle of contradiction.”⁹ This suggests that there is both a real and conceptual dimension to possibility for Kant. Kant explains that logical possibility—“the thing that is thought”—requires only conceptual non-contradiction whereas real possibility requires both logical possibility and agreement with the causal principles of physics and nature—of the real, material world. Rationalists erred in treating logical possibilities as real possibilities in the world. This results in untenable conclusions. For example, wizards are logically possible because nothing about the concept of a wizard is contradictory, so, to the Rationalist, they are really possible. But, as Kant’s insight correctly concludes, wizards aren’t really possible because the causal and physical laws of the material world do not support the possibility of their existence.

The issue with possibility in the thesis of the First Antinomy is that discussing the “unconditioned” as an infinite totality requires the discussion of something that is not and cannot be experienced. By Kant’s own right, if the sequence of appearances is infinite, since infinities are incompletable through synthesis and since synthesis is a necessary condition for experience, the unconditioned is unexperienceable. The unconditioned, then, when thought of as an infinite totality of appearances, exists beyond human experience, for both the Transcendental Idealist and Realist. Almost by definition, the “unconditioned” is where those laws that give us real possibility run out. But since Kant does reach a conclusion for the Transcendental Realist—that the infinite sequence of appearances is really impossible—he must be making a claim about real possibility. For the Transcendental Idealist, it is clear that no determination about the nature of the unconditioned can be made. Under the Transcendental Idealist reading, these laws—or causal principles—only operate to sort out empirical experience and cognition, so they cannot tell us about unexperienceable aspects of the world. Kant’s attribution of determinations about the real nature of the unconditioned to the Transcendental Realist is in line with his criticism of the Rationalist conflation of logical and real possibility. The determinations that the Transcendental Realist seems comfortable reaching about the possibility (or impossibility) of such totalities asserts that for the Transcendental Realist, the causal laws are both for sorting out cognition and laws about the world itself, and hence the gap between logical and real possibility is eliminated. In this way, there is a marked difference in modal framework between Kant and the Transcendental Realist.

But, while Kant does attribute a different modal framework for the Transcendental Realist, there is a certain extent to which their views of logical and real possibility align.¹⁰ Chignell points out that both Kant and the rationalist agree that something can be possible only if there are 1) no logical inconsistencies in its concept, *and* 2) if its positive predicates are somehow given with real content. In other words, existence requires both an explanatory ground (*Grund, ratio*) and an actual cause (*Ursache, causa*). This is also clear from Kant’s separation of real and logical possibility in the *New Elucidation*.¹¹

⁹ Chignell, Andrew, 2009, 171

¹⁰ Ibid., 172

¹¹ Kant & Meerbote, 1992, lxxv

The existence of a predicate, such as an “infinite sequence of appearances” is really possible if there are instances of it, that is, if it has real content underlying it. Put in different terms, the existence of something requires both an explanatory (i.e., logical) ground and an actual cause.¹² The existence of compounds predicates, that is, when two or more predicates are combined, are really possible under the same criterion. The predicate “infinite sequence” is a compound predicate of “infinite” and “sequence.” Note that the real possibility of two predicates *does not* imply the real possibility of their compound. For example, horses and horns are both really possible, but unicorns (or a horned horse) are not. But, the impossibility of one of the predicates (say, if there is no real content underlying a horn) does imply the real impossibility of the compound. So, to reach a claim about the possibility of an infinite sequence of appearances, the Transcendental Realist, and Kant, hold a somewhat similar view: the predicates infinity, sequences of appearances, and infinite sequences of appearances must 1) have logical consistency, and 2) each have real content underlying them.

The question remains: what does Kant mean when he says that the infinite bygone world sequence is *impossible*. For this, we can look again to the *New Elucidation* where Kant writes that “everything which contradicts itself, that is to say, everything which is thought of as simultaneously being and not being, is called impossible.”¹³ This is to say that something is impossible if it is logically inconsistent. Though this is a view that Kant, as a Transcendental Idealist, endorses, we can use this standard to evaluate the Transcendental Realist claim in the First Antinomy for two reasons. First, this is not a definition that is reliant on a specific framework of cognition or experience, in this case, the distinguishing factor between Kant’s own views and Transcendental Realism. Second, as Chignell argues, the claim that possibility requires that concepts do not contradict is a view shared by Kant and Rationalists like Leibniz. The caveat being that since Kant does not describe what exactly he means by impossibility for the Transcendental Realist, it is hard to say if this is the *only* means of proving impossibility for the Transcendental Realist. Nonetheless, given that the law of contradiction is shared by both positions, it is certainly an appropriate means for the Transcendental Realist.

The question for this paper, then, is whether Kant, writing as a Transcendental Realist, errs in concluding that the infinite bygone world is impossible given the rules of possibility he attributes to the Transcendental Realist. Based on the above reading, I propose the following framework to evaluate Kant’s appraisal of the Transcendental Realist. Kant’s claims about the *impossibility* and *existence* of the infinite sequence of appearances in the thesis of the First Antinomy must be that there is 1) either no explanatory ground or no actual cause underlying the bygone world sequence, and 2) the concept of such an infinite sequence is logically inconsistent, i.e., contradictory.

This claim has two issues, the first epistemological and the second conceptual.

¹² Chignell, Andrew, 2009, 170

¹³ Kant & Meerbote, 1992, 10

The Epistemological Issue

It is, in general, a curious move to prove the impossibility of the existence of something through an inability to complete an epistemological process, i.e., synthesis. Even according to Kant's own definitions, especially for the Transcendental Realist who is not bound to the idealist conditions of cognition, impossibility is scarcely related to cognizability. As Chignell points out, Kant holds that we can think things that are not really possible and things can be really possible even if we cannot think them.¹⁴ But in Φ , Kant attributes the following two-pronged view to the Transcendental Realist: 1) something that cannot be completed through synthesis cannot exist in reality, and 2) even given "infinite time," an infinite sequence could not be synthesized (with reference to Wood's argument about traversability and the *Physics*). This is not an argument for the possibility of infinite time, hence the quotations. It is clear that this claim doesn't require experiencing an actual infinite time because if that were the case, then any sequence longer than the lifespan of a human, let alone an infinity, would not exist. It is only a claim that even given a hypothetically infinite amount of time, the sequence could not be synthesized. In other words, I use infinity, as I will argue later it ought always to be used: metaphorically. This two-pronged position is an extremely useful view for Kant. Most importantly, it allows his Transcendental Realist subject to transcend its finite experience and extrapolate facts about infinite sequences. But it is a view that is unjustified.

Kant derives the idea that an infinite sequence of time is unsynthesizable from the framework of cognition he outlines in the *Aesthetic*. In human experience, which is finite in actuality, we understand space and time through the synthesis of finite sequences of sensory data. So, when faced with the task of understanding the sequence of time in its totality, as the Transcendentally Real subject must do in the thesis of the First Antinomy, Kant seems to assume that the subject would need to understand the totality of time through the same epistemological process that it understands finite chunks of that same sequence, i.e., through synthesis. This is evidenced by the very fact that Kant places the subject in the situation of attempting to synthesize, through experience, the infinite sequence of time, then when the subject fails, Kant concludes that the infinite sequence could not exist. The concern is that there is good reason to believe that it is *not* the case that we must understand the totality of time in the same as we understand finite chunks of it. There is even reason to believe that we *cannot* understand totalities of appearances in this way.

In fact, the view that totalities as conceptual entities should be thought of differently from infinite sequences as they are experienced is one that Kant makes explicit in the *Critique* through the distinction between two kinds of totalities: *totum analyticum* and *totum syntheticum*.¹⁵ A *totum syntheticum* is a whole that results from a combination of parts and a *totum analyticum* is a whole that precedes its

¹⁴ Kant, Pluhar & Kitcher, 1997, B xxivn, A 232 ff./B 284 ff

¹⁵ Ibid., A483

parts.¹⁶ Henry Allison notes that “space and time, according to Kant, are such *totum analytica*, which is why they are characterized as infinite, but the material universe, the world in space and time, is conceived as a *totum syntheticum*.”¹⁷ In this way, the conceptual totalities of space and time are *totum analytica*, but the world, i.e. the totality of appearances which require space and time to experience, are encountered as *tota synthetica*. It is also a distinction that fits neatly within the Kantian relationship between understanding and reason. It is understanding that synthesizes individual sensory data points and it is reason which attempts to extrapolate totalities from those data points. So, under this reading, understanding deals with the world as *tota synthetica* and reason attempts to grasp the world as *tota analytica*.

Here, there is a helpful connection to the discussion on modalities. The distinct intentions of reason and understanding are also the crux of the antinomial conflicts. Allison holds that whether or not *tota synthetica* are possible is dependent on whether or not they are conceivable.¹⁸ So, when Kant says in the thesis of the First Antinomy that it is impossible to complete the infinite bygone time sequence, he means to say that the synthesis of infinite sequence is conceptually impossible. In some sense, this is analytically sound given that Kant defines infinities as being unsynthesizable. But even if this were to be true—that the infinity of appearances could not be synthesized—the claim about possibility (or impossibility) relates only to the sequence as a *totum syntheticum*. Precisely because any attempt to synthesize such a sequence means that the sequence is a *totum syntheticum* leads Allison to justifiably conclude that we cannot ever perceive these sequences as they actually are in their totalities—as *tota analytica*. This launches a first attack against the idea that we would need to, or that we even can, understand totalities of appearances using the same epistemological process through which we understand finite sequences. If this is taken seriously, then Kant makes an unwarranted assumption in the First Antinomy by leaping from experiencing the world as a *totum syntheticum* to reaching conclusions about the nature of the world as a *totum analyticum*.

Allen Wood’s interpretation of the First Antinomy offers a second attack on the epistemological grounds of Kant’s conclusion in the First Antinomy. Wood’s argument references the Scholastic, William of Ockham, who argued that the beginning of time may or may not exist, but neither position can be proven.¹⁹ Ockham made a semantic distinction between that which “*cannot be traversed*” and that which “*has not been traversed*.”²⁰ Infinities cannot be traversed, but there is no contradiction in saying that they have been traversed. That is, we cannot positively assert that time has a beginning because we cannot construct a proof in which we successfully retrogressively traverse every moment in the past, however, this is not to say that those same infinite moments have not

¹⁶ Ibid.

¹⁷ Allison, Henry, 1983, 269

¹⁸ Ibid., 369

¹⁹ Wood, Allen, 2009, 252

²⁰ Ibid., 257

occurred. As Ockham observed, if we accept that time is infinite, then there were infinite moments elapsed in the past. This, in tandem with the recognition that we are in the present, implies that the infinity of the past has elapsed and has been traversed. Written in terms of Allison's argument: we can employ reason to grasp that totalities of space and time may exist as *tota analytica*, but we can never ourselves prove, through experience, those totalities as *tota synthetica*. Ockham's argument is that our ability to prove the existence of the unconditioned, and therefore our ability to cognize it, has little to no bearing on the real nature of the unconditioned.

The stronger claim that Kant attributes to the Transcendental Realist in the First Antinomy—that the bygone infinite sequence cannot exist because it cannot be synthesized—fails to consider this. Ockham's distinction provides the third option that unsynthesizability means not that the sequence exists or does not exist, but only that we cannot know. To the Scholastic, that an infinite sequence cannot be traversed is an epistemological shortcoming of human cognition that means we must remain skeptical. But to Kant's Transcendental Realist, the consequence of an infinity being untraversable means that such a sequence cannot exist. We can trace Kant's view back to the *Aesthetic's* framework which requires synthesis for experience and understanding. If we understand time, and we recognize such a thing as the "present," then a synthesis must have occurred that is understandable. Since we cannot synthesize infinities, the synthesis must have been performed on a sequence that was something other than infinite. This line of reasoning would allow Kant to reject the third option proposed by Ockham in a situation that deals with experience. The issue is that the "unconditioned," by definition, cannot be. There seems to be no compelling reason to reject Ockham's admonition to remain skeptical and certainly no compelling reason to accept Kant's move from *cannot be traversed* to *has not been traversed* about the infinite bygone world sequence.

The second attack has one point of confusion which is that it implicitly discusses two distinct epistemological processes. The first is the one undergone during experience and the second is the one required to go back and construct a proof. For example, it is similar to the difference Zeno outlines between walking from one point to the next and going back to divide the journey into infinitely many parts. The confusion, in the case of the First Antinomy, is that both processes, in some sense, are processes of synthesis for Kant. It is, on the one hand, true that we successfully complete syntheses of space and time which define our experience. But on the other hand, when attempting to traverse the past, should we think of it as the same kind of synthesis we employ to understand the same sequences during experience? Ockham's interpretation implies that we ought not to, or at very least, the implications of completing syntheses during the construction of a proof is different. Remembering Zeno's conclusion that it is fallacious to think that we can never complete a journey simply because we can go back divide the journey into infinitely many parts, I argue that we must similarly think about the forward journey (synthesis during experience) as different from the backward journey (synthesis during the construction of a proof). Our inability, then, to regressively synthesize the infinite moments of time *ex post* doesn't preclude the existence of an infinite sequence in the past.

A third attack is launched by Rosalind Chaplin's argument that Kant himself doesn't endorse the view that infinite sequences are impossible.²¹ Chaplin cites Kant's own admission that the infinite sequences of conditions cannot be ruled out as conceptual impossibilities so long as they are *totum syntheticum*.²² Since the sequence of appearances pre-given conditioned elements, or pre-given conditioned elements in the world, are encountered as *tota synthetica* and synthesized through conditioning relations, it follows that the sequence of conditions in the world cannot be ruled out on a conceptual basis alone. She argues that while Kant might rule out the possibility of the *successive synthesis* of infinite series—the precise language of the First Antinomy—he does not rule out the synthesis of infinite sequences in general, so we cannot think of infinite sequences in general as being conceptually impossible for Kant. In the language of Allison, Kant might rule out the possibility of successively synthesizing the world as a *totum syntheticum*, but this does not rule out the conceptual possibility of a *tota analytica* consisting of the infinite sequence of appearances.

We can think of successive synthesis as synthesizing elements of a sequence in the order which the conditioning relation imposes on them. That is, $\{t_0, t_1, t_2, t_3, t_4, \dots, t_n\}$. Chaplin acknowledges that, as Kant makes clear, human cognition synthesizes successively.²³ This fact that successive synthesis is such an intuitive thought to the human mind can be dangerous because it creates the illusion that it is the only means of understanding a sequence. In general, we experience the world using the spatio-temporal intuitions to interpret individual sensory data points, so we experience changes in space and time one state after the next. Similarly, we don't immediately cognize the whole of objects we encounter, rather we synthesize the individual parts so that we can subsume the appearance of the object under the categories of understanding. So, when tasked with enumerating the totality of the intuitions, it is nonsensical for us to use any non-successive method. Afterall, time is an intuition, so it is defined by our experience of it. This means the way that we synthesize must be the order in which the elements exist. The alternative would 1) require the entire sequence of time already existing, and 2) an ability to move back and forth through time non-linearly during the process of synthesis (For example, synthesizing the set in this order— $\{t_0, t_2, t_1, t_3, t_4, \dots, t_n\}$ —is no longer an exclusively successive synthesis). Given that space and time are intuitions of cognition that become available to us, neither of these alternatives seem plausible. The larger point is that while Kant's use of successive synthesis in the First Antinomy makes intuitive sense, it ignores that that intuition ignores how such an infinite sequence can exist outside of human experience, including how it exists conceptually.

To acknowledge one possible criticism of Chaplin's conclusion that infinite sequences are not conceptual impossibilities to Kant, it seems she heavily relies on the fact that in A426, when Kant describes the issue of the infinite synthesis, he does specify that he is talking about the "successive" synthesis. One does have to wonder if Kant intended for his reader to actually consider the alternative,

²¹ Chaplin, Rosalind, 2020, 1

²² Ibid., 18

²³ Ibid., 5

i.e. the non-successive synthesis, as Chaplin does, or if he meant only to say that, in some sense, any synthesis is done successively. Let us consider what Chaplin means by a non-successive synthesis. It is a synthesis that strings together the elements of an infinite set in some order other than the one defined by a succession relation. For example, it might synthesize the set $\{1,2,3,4\}$ as 2-3-4-1 instead of 1-2-3-4. But it is just as possible that Kant meant to say that the synthesis takes each element, one after the other, without reference to the order which they are taken, making 2-3-4-1 just as successive of a synthesis as 1-2-3-4. While this is a compelling objection, Chaplin's response is equally compelling. She argues that her goal is not to positively assert that non-successive synthesis is possible, but rather to point out infinite sequences cannot be ruled out as being impossible.²⁴ Chaplin takes on an almost Kantian strategy of negative argumentation, assuming a dichotomy—the successive and non-successive synthesis—ruling one out, then arguing that the other cannot be ruled out. Perhaps, she suggests, Kant's purpose is to show that human minds cannot achieve a definite concept of an infinite quantity, even if it were to exist.²⁵ Or perhaps Kant's view is that logical infinities are possible but real infinities are not. In any event, there is good reason to believe that, as Wood, Ockham, and Allison each point out in their own way, we ought to be cautious when relating epistemological ability to real existence.

Chaplin makes this explicit, arguing that Kant errs in moving from the impossibility of representing infinities to the impossibility of infinities existing—that is, the intelligibility of time to the human mind doesn't indicate the nature of time itself.²⁶ The confusion is that any Transcendental Realist subject has access only to finite experiences and a finite chunk of the world. So, while that portion of the world that is experienced might conform to the Transcendental Realist's experience, claims about the world in its totality require improper extrapolation. By the same token, just because a Transcendental Realist cannot experience and synthesize a hypothetical infinite time sequence does not mean that the sequence of time in the real world is not infinite. In fact, a Transcendental Realist subject can make no judgment one way or the other about the totality of an infinite time sequence if they experience only a finite interval of it. Whether or not Chaplin is right about the possibility of non-successive synthesis of infinite sequences, her claim that Kant only successfully rules out the successive synthesis of infinite sequences is convincing. The door that it opens for the conceptual possibility of synthesizing an infinite sequence under Kant's own view of possibility—which should not differ for the Transcendental Realist—only exacerbates the epistemological issue in the First Antinomy.

What Allison, Chaplin, Wood, and Ockham all share in common with my argument is a skepticism about the relationship between the synthesis and the existence of infinite sequences. The most compelling objection, I believe, is that Kant has no good justification to even assume that the

²⁴ Ibid., 19

²⁵ Ibid., 5

²⁶ Ibid.

Transcendental Realist subject must understand the totality of space and time through the same epistemological process that he understands the finite chunks that he encounters in experience. In fact, in the next section, I will argue that the subject cannot. Consequently, the move from the Transcendental Realist's failure to complete the infinite sequence to the impossibility of such an infinite sequence is unsound.

The Conceptual Issue

A first comment is that it can be tempting to dismiss criticisms of Kant's argument in the First Antinomy by saying something like, "well, Kant didn't really believe this so the flaws in the argument are just a part of Kant's criticism of Rationalism." But this is misleading. Kant still must produce a good faith logical argument, even if he rejects the tenets of Rationalism in the end. So, conceptual issues that arise in the course of Kant's argument in the First Antinomy should not be dismissed on the grounds that Kant does not endorse the Transcendental Realist's position.

I mention this because the first primary conceptual concern is that Kant, in the First Antinomy, is guilty of what Paul Benacerraf, *Tasks, Super-Tasks, and the Modern Eleatics*, describes as a confusion between conceptual linguistic understanding of concepts and concepts in reality.²⁷ Benacerraf argues that we can *understand*, for example, what a completed infinite sequence is—we have the linguistic and syntactical tools to formulate a notion of a "completed infinite sequence"—but this is not sufficient to show that such a sequence is completable in reality. Benacerraf's examples about completing infinite "tasks," or "supertasks," are especially helpful here. We can think of each "task" as analogous to completing a single step in the process of synthesis.

In particular, he uses the Zenonian example which I have formalized below:

P₁: To go from point A to point B, you must travel to the midpoint A', then to the midpoint A'' between A' and B, then to the midpoint A''' between A'' and B, so on and so forth infinitely.

P₂: It is logically absurd that someone should have completed all of an infinite number of journeys.

C: No one has completed a journey.²⁸

This is clearly unsound. But it is helpful because it is unsound for a similar reason Kant errs in his leap. As Benacerraf writes:

The proper analysis shows that the argument is invalid, that it commits the fallacy of equivocation. The expression "completing an infinite number of journeys" can be taken in two ways. If it is taken in one way, the first premise is false and the second true; in the other,

²⁷ Benacerraf, Paul, 1962, 782

²⁸ Ibid., 766

the first premise is true and the second false. No way of interpreting it renders both premises true.²⁹

Since both premises cannot be simultaneously true, the argument is unsound. If we take the first premise to be true, then the second is false because, as Benacerraf argues, “completing infinitely many journeys takes no more effort than completing one. To say of someone that he has completed an infinite number of journeys (in this sense) is just to describe in a different (and possibly somewhat peculiar) way the act he performed in completing the single continuous journey from A to B.”³⁰ If we take the second premise to be true, then the journey needs to be thought of as infinitely many distinct short journeys and not as one continuous one, so the first premise is false. The issue is that we are describing the same journey in two categorically different ways. The first is through experience—the act of continuously walking from one point to the next—and the second is conceptual—thinking back to the journey and dissecting it into infinitely many pieces. Each description works independently, but they are incompatible when placed next to one another.

What Benacerraf highlights is a fundamental problem with questions about infinity from a Kantian perspective. The thought experiment shows that the journey itself must be thought of differently from the process of going back and cutting up the journey into infinitely many parts. The journey is continuous and experienced, the remembered concept of it is fragmented and is infinitely divisible. This is very similar to the aforementioned point about Ockham that experience must be thought of as different from the retroactive construction of a proof about the past. The problem is that we are asking a question about the nature of reality, but we are asking it through the Kantian notion of cognition, which gives the impression of allowing us to make a claim about the sequence in its entirety by analyzing the process of iterating through the sequence (as we do under the Kantian framework of experience). It is almost (but not exactly) as if Kant is saying the following:

P₁: To go from point A to point B, you must travel to the midpoint A', then to the midpoint A'' between A' and B, then to the midpoint A''' between A'' and B, so on and so forth infinitely.

P₂: It is logically absurd that someone should have completed all of an infinite number of journeys.

C: The journey does not exist.

But, as Benacerraf correctly points out, P₁ and P₂ cannot both be true, so the conclusion is unsound.

None of this is to say that we cannot understand, in some sense, an infinite sequence, but it is to say that we cannot understand a “physical infinity.” Because we have an understanding of the conditioning relations involved in synthesis, we *can* develop some sort of understanding. In a similar way, we can form an understanding of the natural numbers by describing them as the set of integers

²⁹ Ibid.

³⁰ Ibid.

greater or equal to zero defined by the succession relation. We can understand this as a non-terminating list of numbers, and hence an infinite one. But, understanding of an infinite sequence produced through an understanding of the conditioning relations is not an understanding of infinity in reality. This is very much in line with Wood's interpretation of Ockham, as well as distinctions that Kant himself draws between *totum analytical* (space and time in reality) and *totum syntheticum* (time as we understand it). To further the example, there will always be natural numbers that we have yet to enumerate, even if every human and machine capable of enumeration dedicated their lives to counting up from 0. There will always be elements in the infinite sequence that we won't encounter in experience. Yet, in many ways, this would describe the natural numbers just as well. Benacerraf's argument shows that we can both describe the natural numbers as the set of integers greater or equal to zero defined by the succession relation (the conceptual) and by watching someone count up from 0 until they die (the one experienced). Both definitions have the same goal of defining the infinite set, but to say that the infinite set of natural numbers doesn't exist because the person will eventually stop counting, as Kant does in the First Antinomy, is fallacious.

There is a similar problem in the First Antinomy with the distinction Benacerraf draws between the logical (or mathematical) and the physical. It is important to note here that for Kant to successfully complete his mission in the thesis of First Antinomy to discredit the Transcendental Realist, he must establish that both the conceptual and real completion of the infinite bygone sequence of appearances are impossible. Consider this example Benacerraf uses from J.F. Thomson's *Tasks and Super-Tasks*:

Now what exactly do these arguments come to? Say that the reading lamp has either of two light values, 0 ("off") and 1 ("on"). To switch the lamp on is then to add 1 to its value and to switch it off is to subtract 1 from its value. Then the question whether the lamp is on or off after the infinite number of switchings have been performed is a question about the value of the lamp after an infinite number of alternating additions and subtractions of 1 to and from its value, i.e. is the question: What is the sum of the infinite divergent sequence $+1, -1, +1, \dots$ Now mathematicians do say that this sequence has a sum; they say that its sum is $1/2$. And this answer does not help us, since we attach no sense here to saying that the lamp is half-on.^{31 32}

What this example begins to hint at is that the conclusions reached in the conceptual realm may not have physical analogues. It is perhaps a logical conclusion that the lamp will have a value of $1/2$ after an infinite number of switches, but it is meaningless in the physical world. The problem is that the

³¹ Ibid., 6

³² Thomson is referring to Cesaro summations which calculate summations based on the value to which the sequence of means of the previous n partial sums converges. Generally, the infinite divergent sequence does not have a sum, but the decision by some mathematicians to conceptualize the sum as $1/2$ points to the difficulty, or even impossibility, of understanding infinities in any quantifiable sense, and the efforts to do so often yield results which don't make sense in the real world (like being between a binary state).

logical infinity reaches a conclusion (i.e., with the conceptual rules defined for sequences, it converges to a value) but the “physical infinity” never does; or, more precisely, we can’t know if it does.

It might seem strange to use Benacerraf’s paper about machine task completion in the context of the First Antinomy, but Kant’s conclusion about the real impossibility of an infinite sequence from the conceptual impossibility of completing such a sequence fails to recognize the possibility it lacking a physical analogue. We can note that Kant recognizes a similar distinction between conceptual and material space and time. Space and time, according to Kant, are such *tota analytica*, which is why they are characterized as infinite, but the *material* universe, the world in space and time, is conceived as a *totum syntheticum*.³³ Of course, this is written for the Transcendental Idealist position, but there is nothing about the move from Transcendental Idealism to Transcendental Realism that would suggest we should abandon this distinction. The Transcendental Realist, like the Transcendental Idealist, can understand the totality of a sequence as distinct from the individual elements of a sequence, so they too have a notion of *tota analytica* and *totum syntheticum*. It might also be strange to apply the logical versus physical distinction Benacerraf draws to the Transcendental Realist who can make claims about the “physical” or real world. But even for the Transcendental Realist, there is a distinction between the logical and the physical. The logical impossibility of synthesis is not the same as the physical impossibility of sequence because the Transcendental Realist, with a finite life span, cannot, in reality, experience the totality of an infinite sequence. So the domain of their claims about reality, although altogether larger than that of a Transcendental Idealists, does not include claims about real infinite sequences that have not been experienced.

The important analog between this thought experiment and the First Antinomy is that the $\frac{1}{2}$ value is very similar to the “unconditioned”—that is, the result at the end of the infinity. Applying the results of this thought experiment to the First Antinomy yields that there is no good reason to think that the logical nature of the unconditioned—a beginning of time—has a meaningful physical or real analogue. Or, at very least, we cannot discern it. Why, for example, could we not say that the physical lamp, after infinite switches, would land on either 1 or 0? As was the case with journeying from point A to B, the issue is that we are conflating two descriptions of the same process, and those descriptions are fundamentally different. The conceptual—finding the value to which perfectly alternating binary sequence converges—and the physical—the act of flipping the switch.

The second primary conceptual concern is, in his use of an “infinite bygone world sequence,” Kant is guilty of what Benacerraf calls a “conceptual mismatch.”³⁴ This is when “one component (e.g., ‘infinite sequence’) draws the conditions connected with its applicability from an area so disparate from that associated with the other components that the criteria normally employed fail to apply.”³⁵

³³ Allison, Henry, 1983, 269

³⁴ Benacerraf, Paul, 1962, 783

³⁵ Ibid., 784

Kant writes about a similar problem in the *New Elucidation*: “possibility is only definable in terms of there not being a conflict between certain combined concepts; thus the concept of possibility is the product of a comparison. But in every comparison the things which are to be compared must be available for comparison.”³⁶ This availability for comparison should be taken to mean that the components of concept must be applicable to one another. Note that while a unicorn (horned horse) is impossible, it is not a conceptual mismatch in the same way that a sharp sphere is because the concept of horns is compatible with the concept of a horse. A conceptual mismatch need not have real instantiations, but it must be composed of compatible concepts.

Kant’s transgression is that he improperly considers infinity as something that can be applied to experience (i.e., the “task” of synthesis), and therefore errs in saying that infinite aggregates are impossible for the Transcendental Realist. Benacerraf argues a similar point: “sequences of tasks do not exhibit the characteristics of sequences that lend themselves to proofs of infinite.”³⁷ Infinity does not have real underlying content. Consider the above example of the lamp. The result that is reached— $\frac{1}{2}$ —is done on a purely conceptual plane. It is not supported by any law of experience, it is supported only by the conceptual assumptions regarding the convergence of infinite sequences. That is why the result finds no home in the physical domain. This is already a major problem given the modal framework defined above: since infinity has no real content underlying it, an infinite sequence cannot be really possible.³⁸ If this is taken seriously, the First Antinomy falls on these grounds alone.

But the conceptual mismatch arises from the incompatibility of infinity and synthesis. The mistake, according to Benacerraf, is a confusion between things that have not been experienced and things that cannot be experienced. The Transcendental Realist can make claims about reality from experience and can even make claims about things that have not been experienced but could, in theory, be experienced. The Transcendental Realist cannot, however, make extrapolations about things that cannot be experienced, like the unconditioned. Infinity, by Kant’s own right, defines that which is not experienceable. The mismatch occurs because the concept of “infinite bygone world sequence” applies a quality reserved for the unexperienceable (infinity) to a process of experience (synthesis). The more precise mismatch exists in the fact that synthesis is a process of enumeration, but infinity is a quality that deals precisely with the unquantifiable—not that which cannot be counted because it is too large, but that which cannot be described using numbers. Infinity can describe conceptual totalities, but cannot be applied to the tasks of experience, which must be finite. Infinity and synthesis are incompatible concepts because the unconditioned, which exists beyond infinity, cannot be experienced.

³⁶ Chignell, Andrew, 2009, 15

³⁷ Benacerraf, Paul, 1962, 783

³⁸ Kant & Meerbote, 1992, lxxv

The error arises because we assume, as we do with the unconditioned, that the metaphors our mind uses to understand unexperienceable phenomena like infinity conform to the way these phenomena exist in reality. It is true that once we are aware of a totality, we can go back and cut it up in infinitely many ways. This is the basis of Zeno's Paradox, the Paradox of the Continuum, and many of Benacerraf's examples, and it gives the illusion of a paradox by incorrectly asserting that one entity is both singular and infinite. For the Transcendental Realist, this presents itself as assuming that an infinity of time must exist in reality as the summation of individual moments of time because it is through synthesis that we understand the world. But there are two overarching problems. First, it is incorrect to assume that the only way to understand an entity is by enumerating through the infinitely many parts it can be divided into. Second, the very notion of having infinitely many parts is a purely conceptual one. It is problematic to describe a task in experience as being infinite because infinity is not something that is applicable to the world as we interact with it. We can note that Kant makes precisely this point by arguing that we interact with the world as a *totum syntheticum* but its totalities exist beyond experience as *totum analyticum*. Given all of the conceptual problems with the concept of completing infinite tasks, Benacerraf concludes that proofs about the logical impossibility of completed infinite sequences, like Kant's, are unlikely. He argues that any analysis about the concept of a completed sequence would fail to preclude the sequence from being infinite.³⁹ His conclusion is skeptical in much the same as Ockham's. He writes that given the likely inexistence of such a proof, we cannot say that completing infinite tasks are logically possible or impossible.⁴⁰ Under this reading, Kant's argument in the First Antinomy falls because it incorrectly concludes that completing such a sequence through synthesis is impossible.

In an effort to end on a less skeptical note, I propose the following solution through which we can use the Kantian concept of infinity without committing conceptual errors. I suspect that one source of the confusion arises from Kant's definition of infinity being that a sequence cannot be completed through synthesis. This seems to suggest that we *can try to* synthesize an infinite sequence, but we will undoubtedly fail. It is this interpretation that many have employed in their responses to the First Antinomy. I propose instead that we interpret *cannot* not as meaning that we don't have enough time to complete synthesis (which anyways presuppose a notion of time which might be circular), but rather as meaning that an infinite sequence *cannot* be synthesized because it is not something that is compatible with an experiential process like synthesis. Infinity should not be thought of as a quantity, but rather as a metaphor in the conceptual realm for that which is unsynthesizable. With this new reading, the problems associated with Φ aren't resolved, but at least we can reach an understanding of infinity that is both compatible with Kant's own definition and that avoids the conceptual mismatch he falls in to.

³⁹ Benacerraf, Paul, 1962, 781

⁴⁰ Ibid., 781

Conclusion

If the epistemological and conceptual issues are taken seriously, as I think they should, then Kant has failed to make a good faith argument for the Transcendental Realist position, and his rejection of Rationalism through the First Antinomy loses strength. The two issues can be summed up as 1) the possibility of an infinite sequence of appearances cannot be ruled out by the Transcendental Realist's failure to complete the sequence through synthesis, and 2) the concept of "infinity" is incompatible with an experiential task like synthesis. Though these issues should be considered separately from one another, each provides an independent objection against the argumentative leap Kant makes, and neither can be saved by arguing that Kant himself didn't endorse the content of argument in the First Antinomy. For these reasons, salvation for Kant's argument in the thesis of the First Antinomy does not exist.

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Identity and Difference: On Heraclitus' River Fragments

By Bangrui Chen

Bio

Bangrui (Christoph) Chen is a recent graduate student from the University of Pittsburgh who majored in Philosophy and History and Philosophy of Science. His previous background in philosophy includes but is not restricted to the philosophy of science, ancient philosophy, German Idealism (especially Kant and Hegel), Phenomenology (Heidegger), and the history of political thoughts. This Heraclitus paper is as one of the footprints of his reading of the Presocratics, by which he intends to discover the raising of some important themes of metaphysics back in their initial stage. Most recently, after finishing an essay investigating Hegel's revival of the Platonic idealism in his contra-Kant movement, Bangrui's areas of interest are now switching to the history of ideas (intellectual history) with a focus on the extended contents related to the "Querelle des Anciens et des Modernes". He is also preparing himself to examine some core systems of ideas (for instance, Gnosticism) and their influence on modern intellectual and political life.

Introduction

*"[...] Wenn dieses Wort (»alles fließt«) überhaupt von Heraklit stammt, dann besagt es nicht: Alles ist ein bloßer fortlaufender und sich verlaufender Wechsel, reine Unständigkeit, sondern es meint: Das Ganze des Seienden wird in seinem Sein je von einem Gegen-satz zum anderen hinüber und herüber geworfen, das Sein ist die Gesammeltheit dieser gegenwärtigen Unruhe."*⁴¹

– Heidegger, *Einführung in die Metaphysik*

One of Heraclitus' most controversial claims, *panta rhei* (*everything flows*), is derived from his well-known "river fragments" by other ancient philosophers. Beginning with Plato and Aristotle, the tradition of the philosophical interpretation of the "river fragments" has tended to emphasise the notion of universal eternal change in Heraclitean thought, namely the "doctrine of flux." Many objections have been raised against this doctrine, motivated in part by the concern that if all things flow, the efforts of pursuing knowledge would probably be in vain.⁴²

Still, it is a question of whether these ideas derived from those common interpretations belong to Heraclitus himself. Although it has been widely accepted by philosophers before the 20th century that Heraclitus and Parmenides founded two opposing traditions of metaphysics, viz. difference and

⁴¹ "If this saying ("everything flows") stems from Heraclitus at all, then it does not mean that everything is mere change that runs on and runs astray, pure inconstancy, but instead it means: the whole of beings in its Being is always thrown from one opposite to the other, thrown over here and over there – Being is the gatheredness of this conflicting unrest." (Heidegger, Martin, et al. Introduction to Metaphysics. Second edition., Yale University Press, 2014)

⁴² Most of the criticisms target the impossibility of knowledge following *panta rhei*. Thus Aristotle: "In general, it is absurd to make the fact that the things of this earth are observed to change and never to remain in the same state [...] for in pursuing the truth one must start from the things that are always in the same state and suffer no change" (*Met.* 1063a17-20).

identity,⁴³ many scholars have recently raised different readings of Heraclitus, avoiding a radicalisation of his idea into some of the dogmatic doctrines concluded by the ancient thinkers. With regard to the river fragment, for instance, Daniel W. Graham divides scholars' opinions into two groups, which he names 'Heraclitus the Constancy Theorist' and 'Heraclitus the Flux Theorist' (Graham 2006: Chapter Four). While the second group believes that the doctrine of flux is Heraclitus' genuine opinion, the first group finds it problematic and turns to support its opposition. I agree with Graham's distinction, but in order to avoid any generalisation, more efforts should be paid for a complete investigation.

In this essay, I shall reconsider Heraclitus' river fragments. I will open the discussion in section one by presenting and analysing the river fragments closely. In section two, I will list some secondary ancient texts about Heraclitus' flux theory, and then turn to critical examinations of the interpretations found in the ancient texts – especially in Plato and Aristotle, as well as the two moderate variations proposed by many modern scholars who remove some factors in the strong reading. In my view, one of them is still too strong, there is also an issue of vagueness, and the other might not be faithful to Heraclitus' statements. In section three, I shall compare two versions of a weaker interpretation by Christoph Rapp and Daniel W. Graham which denies the doctrine "everything flows". I will then raise my own arguments in defence of Graham's thesis with some developments. Finally, in section four, I will introduce a further development of my thesis and the adoption of it, indicating how it is plausible for us to understand Heraclitus in his own context.

The River Fragments

It is generally accepted that the three fragments below are taken together as the "river fragments," delineating Heraclitus' flux theory:⁴⁴

B12 (Fr.12): It is always different waters that flow toward those who step into the same rivers.

B49a (Fr.49a): We step and we do not step into the same rivers; we are and we are not.

B91 (Fr.91): One cannot step twice into the same river, nor can one grasp any mortal substance in a stable condition, but it scatters and again gathers; it forms and dissolves, and approaches and departs.⁴⁵

⁴³ As an example, Wilhelm Windelband repeats these statements in his *Lehrbuch der Geschichte der Philosophie*.

⁴⁴ There has been much discussion whether all three river fragments are the genuine discourse from Heraclitus. Leonardo Tarán's thorough investigation of the relevant historical discussions shows that all three fragments have been alleged of being spurious by some (cf. Tarán 129-130). In this essay, I assume the authenticity of these fragments and the accuracy of the translations I use.

⁴⁵ I cite fragments B12 & B49a from Laks and Most's (LM) translation (in their numbering, D65a & D65b) (2016), and cite B91 from Kahn (1979). For B 91 (a/b), also see T. S. Robinson's version, where a more detailed translation from Plutarch can be found: [For, according to Heraclitus, it is not possible to step twice into the same river, not is it possible to touch a mortal substance twice in so far as its state (hexis) is concerned. But thanks to <the> swiftness and speed of change,] it scatters <things?> and brings <them?> together again, [(or,

In B.12, the main focus, as the two key adjectives suggest, is on the relationship between the “*same* rivers” and the “*different* waters.” For the observer, the rivers seem to be the same, while the waters in them are different from time to time. At the first glance, the sentence may seem to suggest another doctrine in Heraclitus’ fragments, the unity of opposites (Long, Chapter 5, Section 3: 95). A unity of opposite is a unity of two opposite properties contained in the same thing (e.g., B60, B88). However, the river and the waters in a river are not *the same thing*: the waters are the components of the river but are not themselves the river. And the river is not just the waters, but a collection, a gatheredness of waters, and a unity itself. Because the waters are organised in the same way (to become a river), then even though different waters come and pass, the unity of them in a river, taken together, still shares the identity. Hence, it is more likely that Heraclitus has in mind the sameness (the identity) of the unity in spite of the apparent fluidity (the difference) of its components. Moreover, we might recognise the changing of waters as one essential pattern of a river, rather than a lake or pond. The persistence of a river depends on its changing parts.⁴⁶

In B.91, Heraclitus seems more concerned with the instability of the river, and the word ‘same’ does not appear affirmatively. The reason why we cannot step into the same river twice is that the river would have changed from the first time to the second time. When we say that a river has changed, we mean that the waters we see now in the riverbed are no longer the ones we saw before. According to the text, the eternal change of the waters relates to the unstable conditions of a substance (a river). Still, thanks to this “swiftness,” the river scatters and gathers (waters) from time to time.⁴⁷ The substance that scatters and gathers must be taken as the same one according to the wording (the same subject ‘it’). Also, it makes no sense to put the two stages together if the substance has been replaced by a different one. Therefore, the river we step into is “not the same” only because of its different conditions and not due to the changing of its identity as a substance.

As for B.49a, one significant difference from the other two fragments is that it mentions neither the waters, nor the time. For this reason, B.49a, unlike the B.12, seems to apply the doctrine of the unity of opposites: Heraclitus says that we step and do not step into the same river. An entity, therefore, has opposite properties, namely being and not being itself. It is unsurprising that Heraclitus is accused of violating the Law of Non-contradiction because of this fragment (e.g., Plato *Theaet.* 183a,

rather, it brings together and lets go neither “again” not “later” but simultaneously)], <it> forms and <it> dissolves, and <it> approaches and departs.

⁴⁶ Graham proposes an alternative reading in which the phrase “the same” qualifies not “rivers”, but the person who steps into the rivers (cf. Graham, 2006: 5.4.2 The Sameness of Men, and 2008: 179-181). Admittedly, this is indeed a comprehensible and substantial reading, but I will set it aside for the purposes of this essay, since by doing so Graham takes a very different approach than mine. If “the same” is construed as qualifying the person, the main point of the whole sentence will switch to the identity of the subject, by comparison with the changing of the objects. Instead of an epistemological reading, this essay will investigate the metaphysical aspect of the river fragments.

⁴⁷ According to Robinson’s translation, these happen even simultaneously.

Aristotle *Met.* 1012a24-28). The criticism is sensible, though it presupposes that an identity of opposites is a contradiction, and this presupposition is open to challenge.⁴⁸

The way we might avoid this criticism is by combining B.49a with the other two fragments for context and viewing them as a whole. Taken together, the three fragments suggest that while the components of a substance eternally change, the substance retains its identity. If Heraclitus' fragments are mutually consistent, they mean that we are stepping into the same river, but we are also stepping into a different "river," for new waters flow on and we are not touching the same thing with our feet in every moment. In summary, the identity of the river in relation to the changing waters is the crucial point of the fragments.

How the Strong Reading Fails

Among the ancient interpretations on the river fragments, Plato's and Aristotle's paraphrases are representative:

(A6) Heraclitus somewhere says that all things are in process and nothing stays still, and likening existing things to the stream of a river he says that you would not step twice into the same river. (Crat. 402a8-10)

(Not in LM or DK) So we find the various theories have converged to the same thing: that of Homer and Heraclitus and all their tribe, that all things flow like streams." (Theaet. 160d)

*(D66 in LM, not in DK) [...] the truth of the Heraclitean doctrines that all sensible things are ever passing away. (Met. 1078b32)*⁴⁹

These restatements express the *Strong Reading* of the river fragments, namely, as endorsing the thesis of "Universal Flux (UF)":

Everything always changes in every respect.⁵⁰

Three key factors are contained in the sentence: (1) all things, (2) all the time, (3) all aspects. No one (perhaps except its authentic author, Cratylus himself, who is thought to carry Heraclitus to an extreme) seems to accept this radical idea. The real problem is, however, not its apparent opposition

⁴⁸ For the second phrase, Hegel illuminates the idea behind it in the following way: "Since everything is and is not, Heraclitus hereby expressed that everything is Becoming. Not merely does origination belong to it, but passing away as well; both are not independent, but identical" (*Lectures on the History of Philosophy (Vol. 1)*, 283). By regarding the "origination" and the "passing-away" as identical, Heraclitus is implicitly referring to the fact that everything is in a dynamic process of becoming. Nothing is absolutely the same, except for its "Self-identity", preserved in this permanent flux. The idea of "self-identity" is closely relevant to what I will discuss later.

⁴⁹ For all the Plato and Aristotle works in this essay, I use Cooper and Barnes' translation (instead of LM) for context. The reference is not complete – Aristotle also alludes to Heraclitus' flux theory in *Topics*, *Physics*, *On the Heavens*, etc.

⁵⁰ Cf. Aristotle, *Met.* 1010a6-14 and Plato, *Theaet.* 179d; also see Barnes, 51. The reading actually refers to Cratylus' radicalised version (one cannot enter the same river even for once), but not to Heraclitus' own opinion.

to common-sense, but that the sentence is *self-refuting*. Plato claims that this idea is *incoherent* because it entails a paradox that every perception is no more knowledge than not knowledge, and no statement about anything is more acceptable than its negation (*Theaet.* 182c – 183b). Therefore, all knowledge is impossible. But what if someone denies the possibility of any knowledge? This does not help to save the strong reading; merely in talking about something, I must at the same time assign some properties to that object. If no property can be grasped at a single moment, we cannot talk about anything at all – the utterance is merely the utterance with no meaning included.

Due to the unacceptability of this strong reading, scholars tend to make some modifications to it by removing one of the last two factors from the sentence (UF). But, as I shall argue, their interpretations are either still too strong or incompatible with the text.

One strategy of reinterpretation is to remove factor (3).⁵¹ Barnes alters the sentence to “everything is always flowing in *some* respects” (Barnes, 52); Philip Wheelwright similarly understands it by saying that “everything is undergoing *some* degree of alteration at every moment” (my italics) (Wheelwright, 30-31). However, neither writer makes explicit what aspects of things remain the same and what aspects change. I can assume that they are following Plato in thinking of the two kinds of motion mentioned in *Theaetetus*, i.e., alteration and movement. But if so, just as Plato has already reminded us, if something is changing not in both ways but only one way, we will find that things are changing and not changing simultaneously (*Theaet.* 181e). Imagine Barnes and Wheelwright arguing about the feasibility of articulating which aspects of a thing are changing and which remain, e.g., a stone is doing locomotion while remaining its shape, colour, and solidity, etc., they could be accused by Plato of: (1) if they take the roundness, blackness, and hardness of the stone with its locomotion, then the stone, as the unity of both changing and remaining aspects, is changing and not changing at the same time; or (2) if the roundness, blackness, and hardness are being detached independently from the stone, they are actually taking these qualities as entities too, and something does remain. To put it simply, one cannot claim that “all things are changing while some aspects of all things are not changing”.

The other interpretive strategy is to reject the factor (2), and the sentence then becomes: everything is not changing all the time, but some time. As Christoph Rapp claims, to say “all things change” is not equal to “everything changes at all times” (See Rapp Chapter III, Part 3, *Alles im Fluss*: 69-71, my translation). Kirk, more specifically, states that “Heraclitus did not believe [...] that everything was changing all the time”; although everything must “eventually change”, they can remain the stability at many times as well (Kirk, 1962: 366). Kirk strongly opposes Aristotle’s report about

⁵¹ Many readers notice the apparent conflict between the strong reading and the eternity of the *Logos* discussed in many other fragments. To solve the problem, some scholars accept the change of all other things, except that of the *Logos*, as the universal law that governs the universe (cf. Tarán, 165). This is not a good paraphrase, because the *Logos* cannot be simply understood as a law or principle. I will come back to the point in section three.

what seems to be the idea attributed to Heraclitus, “[...] not merely some things but all things in the world are in motion and always in motion, though we cannot apprehend the fact by sense-perception” (*Phys.* 253b10-12), claiming that Heraclitus never says that “perpetual change escapes our perception” (Kirk, 1962: 376). Therefore, returning to the fragments, everything (including the rivers and the waters) only changes at some time, but also remains the same at other times.

Both Rapp and Kirk believe that with the restriction on time, things remain stable during a long period and thus the continuity of things and knowledge about them become possible. This modification, unlike the other, avoids the problem of saying that things change in some respects without specifying what those respects are, and also attenuates the strong reading to some degree. Other weaknesses still exist. First, it is unfaithful to Heraclitus’ text (especially B.12). Heraclitus clearly affirms the ceaseless flux of the waters in a river: that is, that *some things* are indeed changing all the time. Moreover, the waters in flux are the nature of a river and waters cannot stop; otherwise, the river will sometimes be a ‘frozen’ river.⁵²

We now see the discontinuity between Kirk’s understanding and a real picture of “the waters,” but it seems no more appropriate with “the rivers”. To Kirk, changes do not happen all the time, but everything must eventually change. In Aristotelian terminology, everything has the potentiality to change, even though it is not always changing in actuality. Thus, the river itself must have the ability to change and changes occasionally, although it also remains not changing sometimes. However, one might doubt whether this understanding follows the text, as there is no indication of the changing ability of the rivers themselves. If Laks and Most’s translation is reliable, *it is always* different waters that flow through the same rivers, and Heraclitus does not mention anything about the changing phases of the rivers. Imagine the rivers themselves are changeable; the whole sentence would immediately lose its point (if the rivers can be different from time to time, there will be no need to refer to the different waters).

In effect, according to my textual analysis in section one, the significance of the “sameness” feature of the rivers is as important as, if not more than, the flux of waters within them. The doubt, after all, is that if, in B.12, what Heraclitus intends to say is that everything is changing, then why does he mention the word “same,” and why does he highlight the contrast between the different features of the rivers and the waters by organising the structure of the sentence in such a way?

⁵² Why does Kirk develop this interpretation? It is because Kirk holds firm to the following thought: Heraclitus “believed strongly in the value of sense-perception providing that it is interpreted intelligently” (Kirk, 1951: 41). Our observation tells us that the objects are not changing at every instant, so they are not changing at every instant. However, this is far from the true idea of Heraclitus. Heraclitus does believe that we are very close to Logos in our daily experience, but people lose sight of it. The recognition and understanding of the Logos are certainly different from the recognition and understanding of a table or a stone: the first process is more sophisticated (but not mystical) and ordinary people fail to reach the point. In fragment 123, Heraclitus especially claims that nature always tends to conceal itself. Further, as Shiner argues, Heraclitus emphasizes that “sense-experience will only work when it is conditioned by a prior understanding of the *Logos*” (Shiner, 191).

For these reasons, all readings mentioned above are interpretively untenable.

The Flux of Whole vs. The Sameness of Whole

Up to now, I have examined the strong reading and its two variations. The difficulties shown above suggest that we should attempt a yet weaker interpretation of the river fragments. That is, in contrast to the strong version, according to this reading, something remains unchanged and stable in Heraclitus' doctrine.

If factor (1) in the strong reading is removed, the doctrine of UF will be weakened to the statement "something changes; something does not". The crucial point Heraclitus wants to stress here is obviously not the idea that "some particular things in the world change, while other particular things will not change." Again, the river and the waters metaphorically suggest a comparison between a whole and its components. Most likely, it may even have implications for the world, if taken as a whole, and its individual parts which compose the world.

Still, there remains a further division for two types of weaker reading. In Rapp's discussions, this is a possible way to modify the strong reading: the world as a whole is changing all the time from its genesis, but the flux is not applicable to its every individual component so they might remain (Rapp, *ibid*). In other words, the permanent change concerns only the change of the world as a whole, but not every particular thing in the world. Roger A. Shiner raises a similar thesis: "*Each individual thing*, or in the image, each individual atom of water, does not constantly change" (Shiner, *ibid*).

On the other hand, Graham proposes the opposite interpretation which more consistently sticks to the original text: "local change begets global stability, while global stability focuses local change" (Graham, 2006: 132). By targeting the distinct word "same", he purports to reveal a "striking message" within the B.12: "while different waters flow, the rivers remain the same"; "there is at least one thing that does not flow as the waters flow, namely the river itself" (Graham, *ibid*). What Graham explicitly says here is that while particulars are changing, the "high-level realities" remain unchanged.

Graham then moves on to infer that the high-level reality is the Logos, the ever-present structure of nature, but I shall leave the discussions concerning Logos for later. Now, I go a step further than Graham and raise the thesis that "while all individual things as the parts of the whole are in a flux, the whole remains its identity/sameness". Put briefly, Rapp's thesis is that the whole is in a flux "(WF)," while mine (in favour of Graham) is that the whole is the sameness "(WS)," though its parts are in flux.

We may try to make sense of WF by thinking through the following scenario. To the person who is standing on the bank of the river and watching the flowing water within, the river is changing at all times, because every moment new waters pour into the river from the source, while some waters pour from the river into the ocean. A leaf could suddenly land on the surface of the river, and then float with the surging waves. An observer might think in this way: the leaf is carried by the changing

river as a part of the river in flux, yet the leaf itself remains the same. Analogously, the water inside the river can be divided into many individual parts and each part remains the same while being carried by the flux. Therefore, the river changes as a whole, whereas the parts of the river remain unchangeable.

The proponent of WF, however, would give a different description of the scenario. According to WS, for the person standing on the riverbank, different waters come and leave at every moment, but the river itself and the riverbank which forms the river remain the same. No matter how much water passes through, the river is the same yesterday, today and tomorrow. This stability is maintained because the river has the same properties at all times: e.g., it is located at the same place, has the same length, and so on. Therefore, the river as a whole remains the same, although its components (i.e., waters) change constantly.

Ultimately, although both theses are reasonable, WS outweighs the WF in its fidelity to Heraclitus' text. For in WF, the river, not the waters, is said to be the same. WF also risks inevitable incoherency. For instance, what we regard as a smaller part of a larger object can also be regarded as a whole in itself. Thus, when we hold the idea that that smaller part remains, we take it as a whole, not a part. In fact, if we take something as identical or as the same to itself, that thing must be regarded as a whole entity rather than a subordinate part of a higher-level existence because we are stressing its *identity*. If we try to find the remaining things holding the belief of WF, the infinite regression rises up: once we select a remaining being (according to WF, this should be the part) and start to explain why it remains, the object spontaneously becomes as an isolated "whole" detached and independent from all the outer environment.

We have touched on the tension between the UF and the Logos previously in section two. In his *On the Heavens*, Aristotle reports that "[...] all else is being generated and is flowing, nothing having any stability, except one single thing which persists as the basis of all these transformations" (*Cael.* 298b28-33). Here he intends to adapt the radicalised idea of "Heraclitus" to make it more sensible. Aristotle is much closer to the real thoughts of Heraclitus than Cratylus, once he implicitly infers that the "one single thing" is nothing other than the Logos.

Some readers might regard this as a variation on the *strong* reading discussed in section two (i.e., with the removal of factor (3)), as long as they merely take the Logos as one "orderly relationship between things" (for instance, Kahn 1964: 192), or the ever-functioning physical laws in the world which survives from the flux. The Logos might be taken to be an abstract being. However, in ancient Greek, especially in the Presocratic tradition, the word "Logos" does not mean something as an *entity* but the *account*, more specifically, the account from the world, the universe.⁵³ I conclude that Aristotle's understanding above belongs to the *weak* reading, and is akin to my own reading, because Logos is

⁵³ Especially when it appears in B.1, B.2, and B.50, where Heraclitus adopts an uncommon and striking use of the word.

not simply a pattern, or characteristics, or principle of things in the world, nor an individual entity governs like a law. The Logos, as the most special *account*, is what the world conveys to us about itself, and hence the self-revelation of the cosmos (see Johnstone, especially his conclusions begin from page 21).

Thus, when we hear and grasp the Logos, we are not related to some principles or laws which govern the cosmos. Rather, we are actually hearing and grasping the cosmos itself, without medium standing in between. Briefly speaking, to Heraclitus, the stability of the Logos means nothing other than the stability of the world itself. And “the one single thing” persisting without change is the world itself behind the speech of Logos.

The World as a Self-Identity

Thus far, I have defended my stance FP in section three. But since the notion of sameness is still not analysed clearly, we should next ask: what exactly is the nature of the *identity* of the world? It is, obviously, attributed first to the *sameness* of the world as an eternal existence. As Graham points out, the world itself is stable, everlasting, and “does not come to be or perish” (Graham 2006: 135-136). In addition, I shall also briefly suggest how the world in Heraclitean thought remains identical in at least three more specific aspects: it maintains the same *structure*, the same *essence*, and stays the same in *amount*.

I will begin with the image of the river in Heraclitus’ fragments again. From the point of view of common-sense, the river is possible if and only if two elements are provided, the waters and the riverbed. Without the waters, there is nothing filling the riverbed; without the riverbed, waters are only waters, and there is not a shape that could be called a river. This relationship recalls the formal and material causation of a substance: the waters are the materials, and the riverbed is the form of a river. By the “same structure,” I mean the riverbed that is eternal and never changes in Heraclitus’ image, directing all the waters flow in such-and-such a way. The world, too, has an eternal structure that governs its individual beings as components.

To illustrate the other two patterns which are related to the materials of the river, the fragments of the metaphorical fire (cf. B30, 31, 66, 90) need to be considered together.⁵⁴ When Heraclitus depicts the world as ‘an ever-living fire’, he regards the sea, the earth, and other entities as the different phases of fire. The fire is *hen kai pan*, “one and all.” It is a “one” fundamentally, because the world as a whole is a fire “of which measures are being extinguished, corresponding measures being rekindled” (Kirk, Raven, and Schofield 198). It is also a “more” because it can transform some parts into other beings (secondary beings compared with fire). If all things are an equal exchange for fire, then this is also to say that all things are nothing other than fire, so the source of the world remains the same thing (the

⁵⁴ Kahn has already argued for the relevance of the fire fragments to the flux theory. See Kahn, *ibid.* 196.

different and different waters in the rivers are, after all waters).⁵⁵ Further, the amount of the source of the world (the volume of the river) remains the same because all the changes and exchanges of phases obey “the law of conservation”: according to B90, the transformation between fire and other things is reversible, so if two units of fire condense to one unit of water, afterwards one unit of water returns to two units of fire with the same proportion. The process of proportionate exchange guarantees the amount of the materials in the world remains the same (see Graham, 2006: 171).

Conclusion

In this essay, I have presented several common readings of the river fragments, ranging from strong to weak, with respect to the kind and degree of change they propose, and suggested some difficulties each version will meet. Furthermore, I have developed Graham’s idea to the thesis WS and demonstrated that WS is the most felicitous interpretation of the doctrine. I hope to have proved successfully that with my understanding of the river fragments, Heraclitus’ cosmos, although undergoing flux in its every individual component all the time, is itself the most permanent and stable substance as a totality than any other things within it. Heraclitus’ flux is more like a ‘strategy’ adopted by our world to preserve its constancy over time.

Unfortunately, philosophers in ancient times adopted radicalised interpretations of the doctrine of flux (especially Cratylus, who took the doctrine to its extreme) and so misunderstood Heraclitus. Departing from this interpretation, Plato not only criticises Heraclitus’ flux theory but also raises his own doctrines to defend the identity of reality as the basis of knowledge. However, the difference between the identity and stability of the Heraclitean world and the Platonic or Aristotelian one cannot be overemphasised. I previously incompletely cited Aristotle’s reference to the UF in *Metaphysics* in section two; the original sentence is as follows:

“The supporters of the ideal theory were led to it because they were persuaded of the truth of the Heraclitean doctrine that all sensible things are ever passing away, so that if knowledge or thought is to have an object, there must be some other and permanent entities, apart from those which are sensible; for there can be no knowledge of things which are in a state of flux.” (Met. 1078b32)

Aristotle profoundly recognises that Plato’s pursuit of the Forms is partially motivated by Cratylus’ strong reading of the doctrine (besides the citation above, also see the important discussion in *Met.* 987 a30-b13). But a result of the acceptance of this strong reading is that Plato must place his Forms *outside* this world. Thus, a Platonic world-picture is divided into two parts: things in our sensible world suffer from a constant flux, whereas the forms as true and unchanging reality must be separated from *this world* (cf. Shiner, *ibid*).⁵⁶ For Heraclitus, there is not such a dualism: *this world* is sufficient to maintain

⁵⁵ Compare the proposition: “All things consist of atoms, so all things are nothing other than atoms.”

⁵⁶ Other than Plato, Aristotle defines an unmoved mover as the divine being (God), which is also separated from all other individuals.

its identity, and the introduction of another world above the actual one is not needed (even though Plato might claim that the world introduced by him is the real domain). The Logos is inherent in our world rather than an entity separate from our universe. And the decision to reject or accept the inherency of Logos is perhaps the fundamental difference between the two thinkers.⁵⁷ One might realize after a careful observation that if we follow the hints of Heraclitus' fragments, his lesson is simple and straightforward. But as Heraclitus himself indicates, in B.51, people often do not comprehend how something can accord with itself while also undergoing divergence. This inability produces a historical discussion of the meaning of identity far from his own opinion.

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⁵⁷ Cf. Tarán, 165. And about the denial of the two worlds, a good insight is provided by Nietzsche: "Einmal leugnete er [Heraklit] die Zweiheit ganz diverser Welten, zu deren Annahme Anaximander gedrängt worden war; er shied nicht mehr eine physische Welt von einer metaphysischen, ein Reich der bestimmen Qualitäten von einem Reich der underfinierbaren Unbestimmtheit ab." See Nietzsche, *Die Philosophie im Tragischen Zeitalter der Griechen*: especially Chapter 5.

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