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# Much Badiou about Nothing:

## Productive Misreadings of Mathematical Ideas and Isiah Medina's *88:88*

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**Abstract.** Kepler's model for the solar system was constructed following the formal beauty of the Platonic Solids. Although not scientifically accurate, this model prompted many scientific advancements given that Kepler attempted to justify it using empirical evidence and, until that point in history, scientific research was mainly descriptive. In this article, I will argue that *productive misreadings* of mathematical ideas have the potential to lead to original concepts, and are not necessarily detrimental to the social sciences as physicist Alan Sokal (1998) and others contend. In particular, I will argue that French philosopher Alain Badiou's claim that "mathematics is ontology" is based on a mistake analogous to Kepler's — namely, that Badiou based the underlying structure for his ontological claims on set theory due to its perceived beauty. In spite of this, it will be shown that Badiou's conceptualization allows for novel ontological insight.

By conceptualizing film editing through mathematical conceptions of the infinite, experimental filmmaker Isiah Medina uses mathematics as one of the inspirations for his art. Medina treats philosophy, mathematics, and cinema as a form of free association, a methodology of philosophic freestyle, or academic hip hop resulting in numerous philosophical and cinematic insights. The influence of Badiou's ontological framework on Medina cannot be overstated where even the title of his debut feature *88:88* (2015) functions as metaphor for Badiou's

conception of the *void*. In addition to providing a detail analysis of Badiou's ontological framework, I will also examine Medina's appropriation of Badiou's philosophy and will discuss some of the other ways he applies mathematical concepts in his film *88:88*.

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## § — Beautiful Monsters: Productive Misreadings of Mathematics.

I use the term *productive misreading* to describe a misinterpretation of a concept or an idea in a way that generates new forms of knowledge. While misreadings have the potential to expand knowledge, ideas from the sciences have often been appropriated by those in the humanities to justify their theories. A productive misreading is not a form of justification, it is a way of generating new insight. Scientific concepts should only be used to support new theories in the humanities if the author can justify that their claim satisfies the criteria of the original concept. For instance, the Axiom of Choice should not be used to justify a position regarding freedom of choice, an argument Sokal satirically presents in his faux paper "Transgressing the Boundaries." The axioms of set theory, which include the Axiom of Choice, were obviously not constructed to deal with issues concerning pregnancy; however, they may provide new ways of thinking through these types of social issues.

Given that all communication is, at least to some degree, imperfect some have argued that every interpretation is a form of misinterpretation. For instance, philosopher Slavoj Žižek reinforces this idea in his book *Organs Without Bodies*, claiming that the entire history of philosophy is based on productive misreadings. He writes,

> As Alain Badiou put it, philosophy is inherently *axiomatic*, the consequent deploying of a fundamental insight. Hence, all great 'dialogues' in the history of philosophy were so many cases of misunderstanding: Aristotle misunderstood Plato, Thomas Aquinas misunderstood Aristotle, Hegel misunderstood Kant and Schelling, Marx misunderstood Hegel, Nietzsche misunderstood Christ, Heidegger misunderstood Hegel [...] Precisely when one philosopher exerted a key influence upon another, this influence was without exception grounded in a productive misreading — did not the entirety of analytic philosophy emerge from misreading the early Wittgenstein? (Žižek, 2004, p. ix)

In other words, Žižek argues that "strong" philosophers develop out of productive misreadings of prior philosophers. For Žižek, misreadings are due to the fact that dialogue (as opposed to logical reasoning deduced from axioms) is imperfect. For instance, he suggests many philosophers hold different positions and cannot come to agreement precisely due to the fact that they misinterpret each other and often are "speaking different, totally incompatible, languages, with no shared ground between them" (Žižek, 2004, p. 47).

Žižek's idea for the productive misreading is borrowed from Deleuze, who believed that the history of philosophy is not actually about dialogue, nor a search for truth, but a series of productive misreadings that have led to the production of "monstrous" new ideas. Deleuze uses the act of buggery as a metaphor for productive misinterpretation:

> I suppose the main way I coped with it at the time [an aversion to the academic history of philosophy, which Deleuze saw as repressive] was to see the history of philosophy as a sort of buggery or (it comes to the same thing) immaculate conception. I saw myself as taking an author from behind and giving him a child that would

> be his own offspring, yet monstrous. It was really important for it to be his own child, because the author had to actually say all I had him saying. But the child was bound to be monstrous too, because it resulted from all sorts of shifting, slipping, dislocations, and hidden emissions that I really enjoyed. (Deleuze, 1995, p. 6)

In other words, Deleuze is suggesting productive misinterpretation gives rise to ideas that are mutated and deformed versions of ideas held by previous philosophers, born out of the impossibility of remaining true to another author in spite of the reader's best intentions. By re-imagining the history of philosophy as a form of buggery (combined with immaculate conception), Deleuze is queering it while being blasphemous; an impressive manoeuvre despite the fact that it inherently reinforces a form of misogyny in which one male genius inseminates other.

If we attempt to accurately interpret Deleuze, a gesture which he might argue is impossible, he argues that the monstrous offspring of ideas mutated occur by immaculate conception, implying that these ideas arrive without any real fixed explanation. In spite of the best intentions of the reader to accurately understand the original author, new deformed ideas miraculously arrive. In contrast, it is possible to view these misinterpretations not simply as monstrous reproductions or inaccurate interpretations, but as informed interventions that constitute an attempt to push beyond the original text or context. For instance, mathematical and scientific ideas are often appropriated by artists and theorists, and forced into a new (and often unintended) context allowing for the generation of new ideas outside of their original sanctioned environment. Of course, this form of experimentation is not always successful. However, when it is, it potentially has the power to generate novel ways of thinking about the universe — simply recall Kepler's model of the solar system based on the Platonic solids.

## § — Zermelo-Fraenkel Mysticism: Rationalizing Ontology.

Badiou's magnum opus, *L'Être et Evénement* [*Being and Event*], was originally published in 1988. While Badiou has engaged with a wide range of mathematical concepts and ideas throughout his career, *Being and Event* — arguably the foundational text of his

œuvre — presents Zermelo-Fraenkel set theory (ZFC) as more than merely the foundations of modern mathematics. The book presents a discourse on the science of being *qua* being — the discourse of ontology — where Badiou defines an ontology as "a presentation of presentation" (Badiou, 1988/2005, p. 28). The core principle of Badiou's philosophical framework is fundamentally the equivalence between mathematics and philosophy, a proposition succinctly summarized by Badiou in his most well-known slogan: "mathematics *is* ontology" (Badiou, 1988/2005, p. 4). Philosopher Alex Ling reinforces the mathematical foundations of Badiou's entire philosophical project:

> Fundamental to Badiou's later philosophy is his declaration in *Being and Event* that 'mathematics is ontology.' [...] One could even argue — such is the rigour with which Badiou constructs *Being and Event* — that those who reject Badiou's core philosophy do so foremost because they reject his initial thesis on the equivalence of mathematics and ontology. For if this thesis is unfounded, so too is Badiou's entire philosophy.
>
> (Ling, 2010, p. 48)

While Ling succinctly describes Badiou's core philosophy, I reject his claim that "if this thesis is unfounded, so too is Badiou's entire philosophy." Despite arguing that Badiou's methodology is cause for concern, I am not entirely convinced that his philosophical arguments *necessarily* need a mathematical basis in order to be considered valid, nor do they need to directly correspond to the mathematics following the rigorous presentation in *Being and Event*. As suggested by philosopher A. J. Bartlett, some philosophers have taken Badiou's declaration that mathematics is ontology "too literally" (Bartlett, 2014, p. 307).[(1)]

The framework of *Being and Event* is not entirely novel, and its basis can be found in a form of mathematical reductionism, a branch of mathematics that argues numbers are sets, or that set theory is the ontological basis of mathematics. For Badiou, mathematics has been a sub-genre of philosophy for too long, reduced to the use of mathematical logic or the area of specialization known

[(1)] In particular, Bartlett names philosophers Bruno Bosteels and Peter Hallward. He argues that Badiou's claim that mathematics is ontology "is taken too literally by Bosteels (and Hallward) in the sense that they suppose that a philosophy exists of Badiou ultimately untouched by this ontology, the 'science of being qua being.' "

as philosophy *of* mathematics. In contrast, Badiou argues philosophy is, in actuality, a sub-genre of mathematics: "*philosophy must enter into logic via mathematics, not into mathematics via logic*" (Badiou, 2004, p. 15). Specifically, "mathematics is the science of being *qua* being" (Badiou, 2004, p. 15); or, mathematics *is* ontology.

Badiou's claim that ontology is mathematical does not imply that being is mathematical in nature. According to Ling, Badiou argues mathematics "figure[s] the *discourse* on being" (Badiou, 2010, p. 48); or perhaps more specifically, according to Badiou, "mathematics through the entirety of its historical becoming, pronounces what is expressible of being *qua* being" (Badiou, 1988/2005, p. 8). It is only at this time that we can have such knowledge since the development of Zermelo-Fraenkel set theory occurred in the early twentieth century. Zermelo-Fraenkel set theory, named after mathematicians Ernst Zermelo and Abraham Fraenkel, is an axiomatic system that, when combined with first-order logic (or predicate logic), provides a satisfactory and generally accepted formalism for almost all current mathematics. At this point in time, ZFC is generally considered by most working mathematicians as the foundations for mathematics, but other axiomatic systems do exist.

The foundational claim of Badiou's ontology is found in the statement: *the one is not* (Badiou, 1988/2005, p. 23). This is the very kernel of Badiou's ontology, and an original rethinking of traditional ontological claims where *what is* is one and *what is there* is multiple. Badiou explains:

> We find ourselves on the brink of the decision, a decision to break with the arcana of the one and the multiple in which philosophy is born and buried, phoenix of its own sophistical consumption. This decision can take no other form than the following: *the one is not*.
>
> (Badiou, 1988/2005, p. 23)

To Badiou, there is no unity or consistency to being, making his ontology ultimately anti-theological. In other words, being qua being is an inconsistent multiplicity making ontology the science of the pure multiple. Every moment is a tiny fragment selected from the multiples of multiples.

In order to unpack this, let us consider three key terms in Badiou's text, namely "situation," "count," and "void." First, what "is there" is the presentation of the multiplicity, that is, a rendering consistent of the inconsistent. This unified presentation is, according to Badiou,

a *situation*. In Ling's words, "a situation is the constitution of inconsistent multiplicity" (Badiou, 2010, p. 50); or to Badiou, "the place of taking-place" (Badiou, 1998/2005, p. 24). Second, the way in which pure multiplicity is *situated* or unified is, according to Badiou, the *count-as-one* or the *count*. For instance, in cinematic terms, the editing of a film leads to pure multiplicity at every cut, but the editor must count-as-one, situating the film. On the one hand, this can seem like a rather pretentious way of saying an editor makes choices in order to complete a film. On the other hand, experimental filmmakers often think about the pure multiplicity at every cut, an act that sometimes allows them to overcome predetermined conventions by expanding the lexicon. Finally, according to Badiou, the *void* is the space between the situation and its underlying being or more precisely, "every structured presentation unpresents 'its' void, in the mode of this non-one which is merely the subjective face of the count" (Badiou, 1988/2005, p. 25). Ling uses this idea to further argue, "first, according to the situation, the void is the proper name of being; and second, that everything that *is* is woven from the void" (Badiou, 2010, p. 51).

In *Being and Event,* Badiou is attempting to demonstrate that ZFC correlates to these ontological claims, justifying his controversial claim that mathematics is ontology. As Ling argues,

> Badiou's position on the multiple leads him to conclude that mathematics is ontology. After all, his two major ontological doctrines — that the science of being *qua* being (ontology) can only be the theory of pure or inconsistent multiplicity, and that all that *is* is woven from the void — are precisely what mathematics — or more precisely axiomatic or Zermelo-Fraenkel set theory [with the Axiom of Choice] (ZFC) — thinks.
>
> (Ling, 2010, pp. 51-2)

In other words, Badiou sees a direct correlation between his ontological arguments and ZFC. The first major connection is between the void in Badiou's ontology and what is referred to as the *empty set*, *void set*, or *null set* in ZFC, traditionally denoted $\varnothing$. One of the axioms of ZFC is the Axiom of Existence — which Badiou refers to as the Axiom of the Void Set — which asserts there exists a set with no elements; however, it is significant that this axiom can be deduced from two other axioms, namely, the Axiom of Power Set and the Axiom of Infinity, which implies that asserting it as an

axiom is redundant (Hrbáček & Jech, 1999). Moreover, it is possible to deduce that the empty set is unique through the Axiom of Extensionality. Badiou argues,

> In its technical formulation — the most suitable for conceptual exposition — the Axiom of the Void Set [Axiom of Existence] will begin with an existential quantifier (thereby declaring that being invests the Ideas), and continue with a negation of existence (thereby un-presenting being), which will bear on belonging (thereby unpresenting being as multiple since the idea of the multiple is $\in$). Hence the following (negation is written $\sim$):
>
> $$(\exists\beta)[\sim(\exists\alpha)(\alpha \in \beta)]$$
>
> This reads: there exists $\beta$, such that there does not exist any $\alpha$ which belongs to it.

He continues:

> The mathematicians say in general, quite light-handedly [or more accurately, logically], that the void-set is unique 'after the Axiom of Extensionality'. Yet this is to proceed as if 'two' voids can be identified like two 'something's', which is to say two multiples of multiples, whilst the law of difference is conceptually, if not formally, inadequate to them. The truth is rather this: the unicity of the void-set is immediate because nothing differentiates it, not because its difference can be attested. An irremediable unicity based on in-difference is herein substituted for unicity based on difference.
>
> (Badiou, 1988/2005, p. 68)

Finally, he concludes, "it is because *the one is not* that the void is unique" (Badiou, 1988/2005, p. 69).

Given that this is one of the ways in which Badiou connects his ontological framework to ZFC, it is worth pointing out one major flaw, namely, that Badiou seems to have privileged knowledge about void-ness. For instance, Badiou simply asserts that the unicity of the void-set is *immediate* because nothing differentiates it; but how does Badiou have such knowledge? The *only way* that we should have any knowledge about the empty set is through ZFC

— the concept of the empty set does not have any implicit properties, and its uniqueness is obtained directly through the Axiom of Extensionality. There even exists a set theory where it is impossible to determine if the empty set is unique, namely, the set theory that consists of only the Axiom of Existence. In this ontological system, all that 'is' is void. In other words, its uniqueness is contingent on the set of axioms, not a fundamental truth, and unless we have some implicit or privileged knowledge of void-ness, we cannot determine if it directly corresponds to ZFC. Badiou is also correct in asserting that the *law of difference* is inadequate to mathematicians, but this is because it cannot be deduced from the axioms and is therefore irrelevant within this formal system. Does it just happen that Badiou's ontology corresponds to ZFC, or does the mathematics dictate his ontological claims?

The set-theoretic axioms weren't formulated in order to provide ontological arguments, but were introduced in order to produce a theory of sets that avoided paradoxes such as Russell's paradox. In "Matheme and Mathematics," mathematician Maciej Malicki further suggests that Badiou does not sufficiently or explicitly explain the connection between mathematical axioms and physical reality:

> One also needs to answer the question about the role played by axioms in the structure of *historical* situations. If in the domains of specific languages (of politics, science, art or love) the effects of event are not visible, the content of *Being and Event* is an empty exercise in abstraction: even science — perhaps excluding some entirely formalized areas of theoretical physics — let alone art or love — cannot for obvious reasons be exhaustively described solely in terms of the relation of belonging.
>
> (Malicki, 2015, p. 440)

In one specific instance, Badiou attempts to explain the French Revolution in terms of his conception of the event. His explanation is consistent within his own terminology; however, he does not explicitly show how this could be reduced solely to relation of belonging and the axioms of set theory.

In a review of Badiou's *Numbers and Numbers*, philosopher John Kadvany defends Badiou against a Sokal-esque claim that Badiou is simply misusing scientific and mathematical vocabulary as a form of pretension:

> Badiou, probably not noticed by Sokal, is in this way a *conservative* French philosopher, accepting modernist heterogeneity, but believing it to be mere appearance. The structure of Being, for Badiou, enables us to cognize it in excessively, possibly disastrously, manifold ways, exploring paths of innumerable options, scenarios, frames, and templates, with the whole an inconsistent multiplicity made up of Being's constituent elements. Our world, any world, is a tiny fragment selected from Being's 'multiples of multiples.' It's not that being is mathematical, but that mathematical discourse 'pronounces' what is expressible of 'being qua being.' Theories of anything, but mostly the natural and social world as described using numeric methods, are re-presentations of this ontology. Consistent with the primacy of natural science, numbers and numeric structure have to be 'immanent,' and especially, not 'constructed' via syntax, grammar or other inductive procedures, of which Badiou is completely disdainful: 'if it is true that mathematics, the highest expression of pure thought, in the final analysis consists of nothing but syntactical apparatuses, grammars of signs, then a fortiori all thought falls under the constitutive rule of language.' No Sapir-Whorf hypothesis for this fellow. The need is for an immanent structure of number and numbers, overwhelmingly efflorescent in its structure, persistently unbounded, always already beyond completion in every detail. (Kadvany, 2008)

Beyond giving a beautifully succinct overview of Badiou's overarching project (complete with Badiou's slightly idiosyncratic use of language), Kadvany is arguing that Badiou is not attempting to abuse mathematical ideas to further his own philosophical agenda, but rather attempting to create a unifying, mathematically based, philosophical framework. Moreover, by doing this, Badiou, like Sokal, is attempting "to undo the disastrous consequences of philosophy's 'linguistic turn' " (Badiou, 1988/2005, p. 16). Badiou's conviction in the highest expression of pure thought, mathematics, and his mathematical comprehension are beyond question, unlike many other postmodern philosophers who use and abuse mathematics, as demonstrated by Sokal and Bricmont.

One of the major points of contention in the infamous *Critical Inquiry* debate between philosophers Bartlett and Clemens, and father and son duo of mathematician Ricardo Nirenberg and historian David Nirenberg was "the Matheme of the Event." According to Malicki, matheme to Badiou is "understood as a philosophical idea subjected to rigours of deduction, and opposed to the pre-platonic poem" (Malicki, 2015, p. 434). Badiou defined the matheme of the event as:

$$e_X = \{x \in X, e_X\}$$

where $X \in S$ [that is, $X$ belongs to $S$, or, using Badiou's terminology, $X$ is *presented* by $S$] and $S$ is a situation (Badiou, 1988/2005, p. 179). Badiou refers to $X$ as the "evental site," so $e_X$ is the event of the site $X$. The event is the set made up of all the elements of $X$ and the event itself. To Badiou,

> [The *evental site* is] an entirely abnormal multiple; that is, a multiple such that none of its elements are presented in the situation. The site, itself, is presented, but 'beneath' it nothing from which it is composed is presented. As such, the site is not a part of the situation. I will also say of such a multiple that it is *on the edge of the void*, or *foundational*.
>
> (Badiou, 1988/2005, p. 175)

He later clarifies, "I term event of the site $X$ a multiple such that it is composed of on the one hand, elements of the site, and on the other hand, itself" (Badiou, 1998/2005, p. 179).

The definition of *event* is another of the major points of contention for the Nirenbergs. They argue that $e_X$ is not a set in conventional set theory:

> His 'set' $e_X$ contains 'an inventory,' or 'the historical approach' — namely, $x \in X$ — but also, as we can see, something else: it contains itself. Rather than being defined in terms of objects previously defined, $e_X$ is here defined in terms of itself; you must already have it in order to define it. Set theorists call this a *not-well-founded* set. This kind of set never appears in mathematics — not least because it produces an unmathematical *mise-en-abîme*: if we replace $e_X$ inside the bracket by its expression as a bracket, we can go on doing this forever — and so can hardly be called 'a matheme'.
>
> (Nirenberg & Nirenberg, 2011, pp. 598-9)

More precisely, it can be shown that Badiou's formulation of an event is not a set in ZFC due to the Axiom of Foundation, which states that for every non-empty set there is an element of the set that shares no member with the set. In essence, this axiom exists to prevent Russell's Paradox.

In a review of *Being and Event*, philosopher Paul Livingston is a bit more generous, suggesting that this is not a mathematical mistake at all, but that Badiou intended for the event to be outside of ZFC. According to Livingston, "Badiou terms the 'event,' that which (as he argues) escapes any possible ontological reckoning, but is nevertheless at the core of history and the basis of any possible intervention in it" (Livingston, 2008, p. 218). As Badiou argues, "the event belongs to that-which-is-not-being-qua-being" (Badiou, 1988/2005, p. 189). As if directly responding to the Nirenbergs' objection Badiou states,

> The Axiom of Foundation de-limits being by the prohibition of the event. It thus brings forth that-which-is-not-being-qua-being as a point of impossibility of the discourse on being-qua-being, and it exhibits its signifying emblem: the multiple such as it presents itself, in the brilliance, in which being is abolished, of the mark-of-one. (Badiou, 1988/2005, p. 190)

In other words, Badiou suggests that his definition of event lies beyond the scope of ZFC precisely due to the Axiom of Foundation. Livingston reinforces this reading:

> As further set-theoretical reflection has shown, however, the Axiom of Foundation, though the most direct way to avoid Russell's paradox, is not strictly necessary for the logical coherence of an axiomatization of the nature of sets; various versions of 'non-well founded' set theory take up the consequences of its suspension. [...] For Badiou, however, this is not the basis of a rejection of the axiom itself as a fundamental claim of ontology, but rather an index of the event's capability to go beyond ontology in introducing happening into the intrinsically non-evental order of being. (Livingston, 2008, p. 225)

As Livingston observes, an event is purposefully outside of ZFC in what is called a non-well founded set theory, a branch of mathematics originally initiated by Dmitry Mirimanoff between 1917 and

1920. In fact, Badiou explicitly states, "sets which belong to themselves were baptized *extraordinary* sets by the logician Mirimanoff," and continues, "we could thus say the following: an event is ontologically formalized by an extraordinary set" (Badiou, 1988/2005, p. 190). Unfortunately, Badiou is not correct when he asserts that "event is prohibited" by being since, as Malicki observes, "the Axiom of Foundation may be consistently replaced with its negation — for example, the Aczel Anti-Foundation Axiom is consistent with the remaining axioms of set theory" (Malicki, 2015, p. 446).

One of the more substantial critiques put forth by the Nirenbergs is that Badiou's "mathematical ontology disguises the contingent in robes of necessity" (Nirenberg & Nirenberg, 2011, p. 612). Even the axioms Badiou has chosen are contingent. Badiou argues,

> We definitely have the entire material for an ontology here [namely, ZFC]. Save that none of these inaugural statements in which the law of Ideas is given has yet decided the question: 'Is there something rather than nothing?' [...] The solution to the problem is quite striking: maintain the position that nothing is delivered by the law of the Ideas [namely, ZFC; specifically the Axiom of the Existence], but make this nothing be through the assumption of a proper name. In other words: verify, via the excedentary choice of a proper name, the unpresentable alone as existent; on its basis the Ideas will subsequently cause all admissible forms of presentation to proceed. (Badiou, 1988/2005, pp. 66-7)

From the Axiom of the Existence, there is something rather than nothing and "out of *nothing* (which Badiou interprets the set $\varnothing$ to be) the whole cosmos, he will show us, will be created or rather deduced" (Nirenberg & Nirenberg, 2011, p. 590). Of course, this is an overstatement since Badiou is not attempting to define the whole cosmos; nevertheless, as previously observed, the Axiom of Existence isn't a necessary axiom since it can be deduced from the Axiom of the Power Set and the Axiom of Infinity. Moreover, as the Nirenbergs argue, it is also possible to obtain the empty set from a Weaker version of the Existence Axiom which guarantees the existence of some set and the Axiom of Separation. In other words, from this weaker version of the Existence Axiom, we begin with something beyond the void, prompting a totally new Badiou-ean

interpretation that can be deduced from the law of Ideas (ZFC), namely, that *separation produces the void*.[(2)]

Another problem with Badiou's ontological reductionism is analogous to one of the major objections to the reduction of numbers to sets; namely, there are many ways to reduce arithmetic to set theory. Here are two of the most standard interpretations presented by von Neumann and Zermelo respectively. Take 0 to be $\varnothing$. Next, there are two natural ways to define the successor of $x$, either as $x \cup \{x\}$ or as simply $\{x\}$. In other words, depending on which system you subscribe to, the number two is interpreted as $\{\varnothing, \{\varnothing\}\}$ or $\{\{\varnothing\}\}$. As philosopher Paul Benacerraf argues, "any feature of an account that identifies a number with a set is a superfluous feature of the account (i.e. not one that is grounded in our concept of number)" (Benacerraf, 1965, p. 52). Therefore, Benacerraf concludes numbers cannot be sets. Philosopher Alexander Paseau addresses some of these concerns, ultimately arguing that the arbitrary nature of the interpretation is irrelevant and that "reductionism is not damaged by the availability of incompatible reductions" (Paseau, 2009, p. 51). While Paseau's claim may be true for numbers, the problem is much more significant for Badiou given the availability of totally incompatible interpretations, ultimately suggesting that Badiou's ontological claims are contingent on their interpretation. In other words, Badiou's interpretations of mathematical results seem to determine his ontological claims.

Badiou's claim that "mathematics is ontology" is also heavily compromised in light of the fact that there are many different ways to axiomatize mathematics — some of which, as previously demonstrated, lead to conflicting interpretations. Badiou is fundamentally making a much weaker (and less quotable) claim, namely, ZFC is an ontology. In other words, Badiou's ontological framework is relative to the axiomatic system chosen. Malicki further provides a mathematical argument to demonstrate that Badiou's ontological claims are true only if one neglects some of the results of ZFC. Using the logic of ZFC, Malicki demonstrates Badiou's "generic theory of truth and his philosophy of event can coexist only at a price of selective and instrumental interpretation of the mathematical component" (Malicki, 2015, p. 446). In other words, Badiou is fundamentally making an even weaker claim, namely, that some selective portion of ZFC is an ontology. From this,

[(2)] Just in case it isn't obvious, this formulation is intended to be tongue-in-cheek.

Malicki concludes, "*Being and Event* provides no grounding for a deep ontological structure behind the realms of science, art, love and politics, and that the mathematical formulation of the theory of event has no positive content" (Malicki, 2015, p. 446).

*Being and Event* may not provide an ontological structure for science, art, love and politics; however, Badiou's attempted endeavour is quite admirable and not, like Malicki asserts, without positive content. As Livingston argues,

> From these results of set theory [Badiou] draws a host of provocative conclusions about being, knowledge, language, and truth, the paradoxical 'event' that interrupts them, and the structure of a reconceived subjectivity whose essence is 'fidelity' to its consequences. In deriving this wide-ranging philosophical discourse, Badiou treats the axioms and theorems of set theory (on one of its various possible formulations) as if they were something like a revelatory text in which one can directly read the contours of being itself, as well as their inherent limitations. [...] This identification, like other decisive claims throughout the text, is not the result of any deductive or inductive argument, but rather of a basic and free decision, which Badiou likens to the mathematician's decision to adopt or refuse a particular axiom in the course of speculative mathematical thinking.
>
> (Livingston, 2008, p. 219)

Once again, the "free decision" Badiou is making is precisely what weakens his claim for an ontological basis; however, this does not make his insights less illuminating. As observed by Kadvany, "Badiou's ontological narrative is allusive, poetic, and deeply metaphorically *inspired* by his understanding of modern set theory" (Kadvany, 2008). This, in essence, can be read as the heart and soul of the Nirenbergs' actual criticism:

> In deducing philosophical and political consequences from his set-theoretical arguments, Badiou confuses contingent attributes of informal models with necessary consequences of the axioms (we will call this type of confusion a *Pythagoric snare*). The politico-philosophical claims that result have no grounding in the set theory that is deployed to justify them.
>
> (Nirenberg & Nirenberg, 2011, p. 590)

To this, Bartlett and Clemens have responded, "that mathematics is ontology means precisely and decisively that philosophy does not do ontology and that mathematics does not determine philosophy. Nor does mathematics constitute truth. Nor does being subject on Badiou's terms mean, as Nini [Nirenberg & Nirenberg] brazenly claims, that 'our only choice lies with the axioms of set theory' " (Bartlett & Clemens, 2012, p. 368). Despite the fact that it is incredibly bad form to argue something *precisely and decisively* in the negative, it is worthwhile to heed their criticisms in the light of Kadvany and Livingston's idea of creating an ontological narrative based on set theoretical claims.

In spite of its major shortcomings, *Being and Event* is an example of an incredibly productive misinterpretation of set theory. Using ZFC as a basis, Badiou produces a consistent ontology, one that doesn't necessarily follow from its mathematical inspirations, but is nevertheless a highly creative misinterpretation of the mathematics that it attempts to mirror. As Kadvany argues,

> I think Badiou has the roles of informal mathematical narrative and proof exactly reversed. He believes, like set theorists of old, in mathematical *realism*. But that's not what counts in mathematics, Gödel's platonism notwithstanding. Believe what you want. What matters are new systems, logics, heuristics, conjectures, counterexamples, theorems, proofs. However you explain these is fine, but don't take mathematical metaphors too seriously, even as these are essential to understanding, communication, and teaching. In particular, the idea that ZF, or other set theories, provide 'foundations' is itself a metaphor, true in part, but today far from having the ultimate status envisioned by Frege, Russell, or Gödel. (Kadvany, 2008)

The ontology created by Badiou is one that deviates through a productive misinterpretation. The ideas it presents lay the foundations for an ontology that moves beyond theological or mystical ideas (which have no place in mathematics nor ontology), and attempts to provide an ontological framework outside of language and hermeneutics. There are also some connections between Badiou's ontological framework and the world. For instance, philosopher Christopher Norris (2009) suggests that Badiou's concept of the *count-as-one* can be applied to the ways in which political systems exclude and disenfranchise those who do

not *count-as-one* within the system, like unrecognized immigrants. Once again, this is highly speculative, since the rules of set theory were constructed to provide foundations of mathematics without considering potential legal interpretations. Despite providing an underlying framework, studying set theory to better understand a system in which being accounted for determines a person's political status seems akin to studying the retinal system to better understand those who exist on the *periphery* of a legal system.

At this point, I feel safe in asserting that Badiou's claim that *mathematics is ontology* is fairly unsatisfactory. Like Kepler's model in *Mysterium Cosmographicum*, Badiou has put too much faith in the underlying mathematics and mathematical metaphor, or perhaps he does not intend for us to take him "too literally." From Kepler's model, it is possible to see one of the ways to transform an 'error' into an advancement of knowledge. By observing the ways in which the empirical evidence deviated from the model, it was possible to build upon and transform Kepler's model into a more accurate model, one that reflects the real world. Returning to Badiou's model, this is precisely the way in which it can be used. Badiou is basing his ontological arguments on what he perceives to be a perfect model, namely ZFC, an idealistic pursuit. Badiou's model and methodology are flawed; however, if this model is to be useful, its utility will be found in observing the ways in which deviates from empirical evidence. Like Kepler's model, Badiou's philosophical system should not be seen as a final model but as setting the foundations for a new approach.

## § — The Logic of *88:88*: Appropriating Badiou.

Medina's film *88:88* blends diaristic filmmaking, formal experimentation, and staged scenarios, presenting brief glimpses and fragmented moments. The film also experiments with multiple images superimposed on the screen, frames within frames, and video feedback. The sound design is often jarring, with text and music cut abruptly, and with much of the fragmented texts whispered to the audience. The texts themselves are cut up and layered, and come from numerous sources including readings of philosophy and poetry, hip hop and personal conversations between friends. Through brief glimpses and snippets of conversations, the film creates an intimate portrait of life in the West End of Winnipeg, Manitoba documenting Medina's friends and the poverty and social

injustice many of them face. Reading the film in the diaristic tradition, the images and recorded conversations can be seen as documenting Isiah's external life, his interactions with his friends and daily experiences, while the spoken texts can be seen as framing Isiah's internal life, as materials that informs his worldviews and perspectives.

The title *88:88* is a reference to the graphical display that is left on a digital clock when there is no power, or the graphical default that blinks on and off on a digital clock to indicate a power outage. Medina provides a political reading, stating "88:88 (or --:--) appears if you cannot afford to pay your bills, demonstrating that people who live in poverty live in suspended time" (Enns, 2015, p. 9). Film critic Benjamin Crais extends this reading, suggesting its connection to the void and Badiou's concept of the pure multiplicity:

> With *88:88*, Isiah Medina gives a name to nothing. 88:88 signifies no money, no electricity, but also no time: a digital clock reads a time that does not exist, that has never and will never come. Yet, in giving it a name, Medina grants nothing a positive existence. It is not only a lack, but what the philosopher Alain Badiou calls a pure multiplicity or inconsistency: the 'stuff' that is ordered and structured in the presentation of being. 88:88 — an image that contains every possible readout a digital appliance can present (11:35, 02:50, 12:00, etc.). Nothing — 88:88 — thus becomes the ground from which all articulations can emerge, a pure potential from which individual existences are cut. (Crais, 2016)

In other words, Crais sees Medina's use of 88:88 as the void and as a metaphor for pure multiplicity. Medina further reinforces this observation, suggesting cinema is a *no-thing to see* (or in Badiou's terminology *inconsistent* or a *pure multiplicity*) before it is realized (made *consistent*, or *situated*, or *count-as-one*). Isiah argues "there will always have been no-thing to see, but this inconsistent no-thing, the interval, must be given structure, must be made consistent" (Coldiron, 2016).

Almost following directly from Badiou's conception of the void, Medina defines *88:88* similarly:

> There is no given, and even if when in poverty you can say 'I have nothing,' to be completely clear, this nothing is itself not given. So poor, even nothing itself is not given.

> So we need a new name of nothing. Our own name, to be able to begin. And that name for us was 88:88.
>
> (Coldiron, 2016)[3]

To express this idea in the film, Medina samples a line from the American rapper Big L: "I wasn't poor, I was po! I couldn't afford the – 'or.'" This lyric can be interpreted in a few ways: too poor to be able to afford the education to correctly pronounce poor; too poor to be able to afford the operating room (O.R.); too poor to be able to afford gold, given "or" means "gold" in French. In the case of Medina, there is also "so poor, even nothing itself is not given," a new conceptualization of the void, the space of total poverty. To live in this space means to embody pure multiplicity and to not count-as-one.

The concept of infinity also plays a role in *88:88*. Graphically, $\infty$ is simply the number 8 turned on its side. As observed by Crais, "it is only a matter of orientation to conceive nothing (88:88) as infinity $(\infty \times 4)$" (Crais, 2016). In the film, while one of Medina's friends discusses hearing voices, he mentions losing his trust in infinity. Medina responds "Wait?! So you lost trust in infinity?" Medina connects his friend's schizophrenic episode to his temporary loss of faith in the infinite (among other things), an idea that seems as problematic as equating schizophrenia to a loss of faith in God. In another scene, a woman dressed as a revolutionary wears a red armband with a black $\omega$ on it. In set theory, $\omega$ usually denotes the first infinite ordinal, a concept introduced by Georg Cantor in the late nineteenth century to conceptualize infinite sequences. By putting $\omega$ on the armband of a revolutionary, Medina implies the revolutionary potential of the infinite.

In an interview about *88:88*, Medina associates $\omega$ with the cut, hence asserting the revolutionary potential of montage in his filmmaking. Medina explains:

> The shot inevitably comes to an end, and let us call $\omega$ the end of this repetitive model of succession; $\omega$ ends the repetition of $n + 1$. A historical interruption to the tendency of naturalization in a tracking shot. It is not considered in frame, nor does it succeed it — as a point it surpasses the potential 'tracking shot' not by adding to it, but by

[3] Isiah explicitly references the symbol $\varnothing$. Moreover, many lines from *Being and Event* are read throughout the film and a well thumbed copy of the book makes an appearance.

> being the horizon of its succession. A cut, $\omega$, retroactively totalizes the potentially infinite shot, and becomes its *limit.* We can succeed by applying the same operation, $\omega + 1$, reopening succession. But $\omega$ is not a successor to the first succession; $\omega$ was itself a support for the prior potentially infinite succession. The consequence is that there is more than one form of the *intervallic*. The space between frames is not the same one, because, if so, then we are, despite appearances, still within a tracking shot, within the one, within the same form of succession that is $n + 1$, and no cut has taken place. (Coldiron, 2015)

Given that cinema is a *finite* sequence of shots, Medina sees the cut as a way of realizing cinema's infinite potential. Medina reinforces this reading by arguing that "Cantor would claim there are infinite paradises, infinitely new forms of the cut (the mark of infinity, the end of repetition), in the finite images of our world" (Enns, 2015, p. 9). In other words, at every cut a new realm of possibilities is opened up, or "without the cut, we remain in finitude" (Coldiron, 2015). By viewing the cut in these terms, Medina is attempting to use mathematics to expand and rethink the concept of the cut beyond its traditional uses.

To Medina, it is through the cut that cinema begins to represent the filmmaker's thoughts. As he suggests, "there is a mental image and a material image, but these are held together by the cut" (Coldiron, 2015). It is at the place of the cut that we begin to see the filmmaker's perspective, remembering "that there must be a cut before the shot even begins and a cut for the shot to end" (Coldiron, 2015). That is, in order to construct a shot, the filmmaker must cut it from reality. Through the cut, Medina believes that it is possible to free the footage from one subjective perspective. He argues,

> Without the subjective action of cutting creating new exclusions, true lines of division, we will only have one interval. There will only have been one cut, and the cut will be an objective law, rather than the infinite, subjective production of new truths. (Coldiron, 2015)

Although the cut may have the potential for "the infinite, subjective production of new truths," in the end there will be only one film. Doesn't this, using Medina's logic, make it an objective law? In contrast, even if the filmmaker chooses only one shot, *only one*

*interval* without a cut, they have chosen that shot, as Medina has previously argued, from all of the infinite shots available potentially allowing for the infinite, subjective production of new truths.

Finally, the graphical representation of infinite, ∞, resemble handcuffs, which also play a role in Medina's film. With his hands cuffed behind his back, Medina is shown walking through downtown Toronto. Chained by the infinite, Medina, shot from below, walks past massive skyscrapers and through a field of shadowy 8s. As Crais suggests, "Medina equates 88:88 with imprisonment, with numerous 8s forming the material out of which a chain-link fence is constructed" (Crais, 2016).

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88888888
88888888

The revolutionary potential of the infinite is juxtaposed with the reality of those who conform to societal norms. Medina presents this argument in a slightly different form in the film while comforting a friend. He suggests, "when people think they're crazy, they just assume a certain way of being in the world is correct."

Where Badiou uses mathematical concepts to develop an ontological framework, Medina uses mathematics to develop a cinematic framework. Through the use of mathematics, Medina is attempting to see cinema in new ways. Like Badiou, he is also applying the same mathematical systems in an attempt to understand social, legal and psychological systems to explore problems beyond the underlying logic of ZFC — an axiomatic system not conceived with these concerns in mind. Nevertheless, by evoking the infinite, Medina is pushing the poetic potential of cinema by suggesting the cut as having the potential to create new possibilities. In thinking through the infinite, Medina is attempting to conceptualize the infinite possibilities of cinema, a cinema beyond that which has already been shown to us.

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