Places and Constellations:
Mallarmé and the Evental Poetics of the Matheme

by

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Newton's binomial is as beautiful as the Venus de Milo.
The truth is few people notice it.
(Álvaro De Campos)

Il y a les vivants, les morts, et ceux qui vont sur la mer.
(Gilles Grelet)
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1. Reductions and Decisions:
Deleuze and Badiou on the Dice-Throw

The ascetic peak of French structuralism is to be found among the pages of the
*Cahiers pour l’Analyse*, a journal published between 1966 and 1969 by a group of
young philosophers profoundly influenced by the work of Jacques Lacan and
Louis Althusser. With thinly veiled disgust toward the humanistic existentialism
that had been imported into France in the interwar period, the various
contributors and editors of the *Cahiers* sought to disturb the Sartrean status quo
by developing a non-phenomenological theory of the subject that would draw
not from Husserl and Heidegger, but rather from midcentury French
epistemology, structuralist Marxism, and deeply formalist psychoanalysis.
Indeed, the task at hand was to reconsider in a post-war structuralist framework
the various perspectives on the philosophy of science that had previously been
developed in the contexts of physics and chemistry by Gaston Bachelard, of
mathematics by Jean Cavaillès, and of biology by Georges Canguilhem. Typical
was Cavaillès’ critique of Husserl, wherein he held that, in a renewal of the
Leibnizian search for a mathesis universalis, the sciences can “no longer be
considered as a simple intermediary between the human spirit and the thing-in-
itsel, dependent on both and having no reality of its own, but rather as an object
sui generis, original in its essence, autonomous in its movement.”¹ The high
structuralism expounded within the pages of the Cahiers rejected the study of
either the human spirit or the thing-in-itself. Rather, they held, it would be
through the rigorous and logical study of capital and psyche alike qua
autonomous, formal objects that a truly anti-humanist rationalism would be
capable of overcoming the phenomenological status quo just as Althusserianism
was capable of, as Knox Peden writes, “producing a Marxism decoupled from
Hegelian metaphysics and its humanist avatars.”² The formal sciences of
mathematics and logic were taken as exemplary models for this enterprise in the
sense that, together, both provide the necessary tools to investigate richly
structured phenomena without reducing these phenomena to reflections of
human consciousness.

With this apotheosis of formal rationality and denigration of humanism, it
is surprising that Mallarmé, poetically anti-humanist avant la lettre, did not
factor more heavily in their theoretical work. Not even Nietzsche could insist as
profoundly on the absence of a concrete doer behind the deed. As Foucault

¹ Jean Cavaillès, Sur la logique et la théorie de la science (Paris: J. Vrin, 1997), 36. “…la science n’est
plus considérée comme simple intermédiaire entre l’esprit humain et l’être en soi, dépendant autant
de l’un que de l’autre et n’ayant pas de réalité propre, mais comme un objet sui generis, original
dans son essence, autonome dans son mouvement.”
² Knox Peden, “The Fate of the Concept,” in Concept and Form: Interviews and Essays on the
holds, “Whereas Nietzsche maintained his questioning as to who is speaking right up to the end, though forced, in the last resort, to irrupt into that questioning himself and to base it upon himself as the speaking and questioning subject: Ecce homo, Mallarmé was constantly effacing himself from his own language, to the point of not wishing to figure in it except as an executant in a pure ceremony of the Book in which the discourse would compose itself.”

Mallarmé’s gift was his ability to allow both poet and narrative to function as contingently demarcated regions of a massive and unfeeling linguistic apparatus that, with the death of not only the God of religion but also the poetic god of Heidegger’s nur noch ein Gott kann uns retten, “travels ancient through the fog, and like a sword / penetrates your innermost agony.” The subject, shot through in this way by inhuman language, is dethroned insofar as for Mallarmé, “the pure work [of poetry] implies the disappearance of the poet speaking, who yields the initiative to words, through the clash of their ordered inequalities.”

The mathematical language of the inequality has not been taken lightly in some of the most interesting philosophical treatments of Mallarmé’s work—especially his singularly important Un coup de dés n’abolira jamais le hasard. Jean Hyppolite’s “Le coup de dés de Stéphane Mallarmé et le message,” written eight years before the formation of the Cahiers, is exemplary in this respect. Observing that a

“comparison between the mathematical theory of information and the theme of

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the *message* in Mallarmé’s is well worth the struggle, Hyppolite suggests that, in spite of the myriad interpretative difficulties that *Un coup de dés* presents, it remains uniquely suited to a profoundly mathematical reading that comprehends the poem more in terms of formal object than of human artifact. Yet, out of all of the thinkers affiliated with the *Cahier*, only Alain Badiou would attempt to bring to fruition a mathematically inflected reading of Mallarmé’s *Un coup de dés*.

This project, however, depended upon the collapse of the high structuralism championed by Badiou’s colleagues at the *Cahier*. Hyppolite’s reading, though profoundly interesting, is also extremely unsatisfying insofar as it does not have in its armamentarium a theoretical apparatus that can deal with the radically *evental* nature of the Mallarméan dice-throw. As will be outlined below, the dice-throw is to be read in this instance as something that holds within itself the possibility of the emergence of the radically new. In Hyppolite, however, the dice-throw is reduced to a metaphor for the myriad but ultimately finite possible combinations of what already exists—and this too is a likely outcome for a naively structuralist reading of *Un coup de dés*. The question of how not just particulars but also structures can come into being *de novo* was one that would trouble many in the later years of French structuralism. As Gilles Deleuze argues, it is on the basis of the inability to properly subsume the event that “a set of complex problems are posed for structuralism, concerning

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structural ‘mutations’ (Foucault) or ‘forms of transition’ from one structure to another (Althusser) [that assure] the break-up [l’éclatement] of a structure affected by excess or deficiency.” Foucault was able to escape these problems by turning to Nietzsche; Althusser likewise adopted a self-critical stance that, as Peden writes, “dismantled the elaborate constructions of For Marx and Reading Capital.” In short, Peden notes, “with the notable exception of Alain Badiou, the editors of the Cahiers generally emphasize the degree to which their effort belongs to the past,” arguably because Badiou, in his reading of Mallarmé together with the mathematical language of axiomatic set theory, has been able to construct a coherent notion of the event that, insofar as it is formalist, stands in partial continuity with the Cahier project.

Though its consistency ought to be admitted, the question of the adequacy of Badiou’s thinking of the event—and, by extension, of his thinking of the Mallarméan dice-throw—still looms large. Alongside Badiou’s interventions into the elaboration of the ontology of the event, contemporary continental thought offers no paucity of alternative theorizations of the event. Though this list is far from exhaustive, consider the evental phenomenologies put forward in Jean-Luc Marion’s Being Given (2002) and Claude Romano’s Event and World (2009); the alternative recuperations of Heidegger in Jacques Derrida and Jean-Luc Nancy; and Catherine Malabou’s recent work

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9 Ibid., 1.
wherein her take on the biological notion of plasticity bespeaks “the eventlike dimension of the mechanical.”10 Indeed, as François Laruelle notes, “[The] event has become a theme allowing one to gather together and situate almost all of French philosophy after the period of structuralism in its strict sense.”11 Yet, for all of these meditations upon the nature of the event that seek, in their very eventality as theoretical interventions, to disturb the neat relational logic that Derrida identifies as bound up “in the history of the concept of structure,”12 we find the citation of Mallarmé and his dice-throw as a model for the event but a few times in recent years. This is most explicit, of course, in Badiou, who claims to think “in the style of [his] teacher, Mallarmé,”13 but also in Badiou’s erstwhile philosophical foil, Gilles Deleuze. This is to say, few thinkers have seen fit to place the dice-throw at the heart of what Laruelle has termed l’événementalité, or “the figure par excellence of the event.”14 Thus, we must ask, what is it about Deleuze and Badiou, thinkers disparate in so many ways, that induces each to to place the dice-throw at the heart of this événementalité, their theories of the event, or of their ontologies writ large.

Though the figure of the evental dice-throw recurs throughout Mallarmé’s oeuvre, it finds its most nuanced and provocative treatment in Un

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coup de dés.\textsuperscript{15} The formal attributes of this poem are immediately most striking. Unpunctuated and strewn across multiple pages, the line of twelve syllables—the alexandrine—that was \textit{de rigueur} in classical French poetry undergoes what Mallarmé describes as a ‘dispersal’ of the traditional poetic order of things. As Mallarmé writes in the preface to the 1897 \textit{Cosmopolis} edition of the poem, this dispersal of the alexandrine “mentally separates words or groups of words,” thus establishing as the basic unit of the poem not the verse or the perfect alexandrine, but rather the double-paged assemblage, recto and verso, that is phenomenologically given “though a simultaneous vision of the Page.”\textsuperscript{16} Though, as Mallarmé writes, the narrative in \textit{Un coup de dés} “rises to the surface and quickly dissipates, following the variable motion of the writing”\textsuperscript{17} across the many double-paged units, we can detect in the poem a well-crafted fiction. We happen upon a shipwreck in the midst of a storm, but we cannot see the ship—only a shadow that suggests its recent sinking. In the water above the shipwreck is the \textit{maître}, a captain without a vessel, who is left with but one choice: shall he throw the dice that he holds aloft in his fist? This question is not answered; with the outcome held in narrative deferral, the poem moves to a description of a whirlpool that seems to have swallowed the \textit{maître}. His feathered cap circles the void; out of the void comes a siren who, like Kafka’s messiah, destroys but a

\textsuperscript{15} In citations of \textit{Un coup de dés}, I will refer to the so-called ‘University of California edition’ as published in Stéphane Mallarmé, \textit{Collected poems}, ed. Henry Weinfield (Berkeley, Calif.: University of California Press, 2010). This is a variant of the 1980 Ronat typesetting, which most closely corresponds to the corrections that Mallarmé made to the proofs of his poem before his death.\textsuperscript{16} Stéphane Mallarmé, “Preface (to Un Coup de Dés...)” in \textit{Collected poems}, ed. Henry Weinfield (Berkeley, Calif.: University of California Press, 2010), 121.\textsuperscript{17} \textit{Ibid.}, 122.
moment too late the rock that caused the maître’s vessel to sink. All we are left with is a conditional that gives no closure to the question of whether the dice were thrown. Had the dice been thrown—and we do not know if they truly had not been—then, Mallarmé writes, the place of the shipwreck would have joined with the infinite beyond of chance and the unthinkable would have happened, the maître would have been saved, and a new constellation would have appeared. Two major ‘enclosures’, each coeval with a major phrase, characterize the transits between the actual and the possible in this interpretation. Following Quentin Meillassoux, we observe that the poem is defined by a “syntactical construction based upon a complex of interpolations into two principle clauses.”18 The first enclosure is marked off by the poem’s title, which we trace according to its consistently heavier typeface across the first nine double-paged units of the poem. Within this particular poetic field, all we are given is an incomplete account of that which occurs concretely. The ship sinks, the maître holds his fist aloft, the hat circles the abyss, and the siren destroys the rock. The second enclosure is circumscribed by the famous “nothing will have taken place but the place, except perhaps a constellation.”19 If the dice had been thrown, if the maître had obtained the proper result, if the universe was willing—then, perhaps, in the relation between the void that stands in the place of the sunken

ship and the beyond, something *de novo* would emerge in the form of a stellar arrangement.

The formal and narrative complexity of *Un coup de dés* suggests that there is no simple transposition to be found between the poem and a philosophical thinking of the event. Indeed, between our avowed Mallarméans, Badiou and Deleuze, we find two modes of thinking this dice-throw, the necessary but insufficient condition for the constellation, that differ in radical ways. Writing of Mallarmé’s earlier *A la nue accablante tu* (1894), comprehensible in some significant respect as materials toward *Un coup de dés*, Badiou identifies a process of ‘subtraction’ at the very heart of Mallarmé’s poetics, arguing that “the name of the event can only be implied from its disappearance”\(^{20}\) not only in the poem but with respect to events writ large. This, for Badiou, is the essential logic of the Mallarméan event: it is only ever inferred from a trace, a mark of an absence that stands for a presence that has since vanished. In surplus of a mere negation of the event, Badiou’s Mallarmé brings to bear a “multiplicity of subtractive operations”\(^{21}\) in the very syntax of his poetry that effect metonymic chains of vanishing terms. The subtractive work of the poem holds in deferral the event, which is only ever named in iteratively abolished signs. In other words, the event can only ever be inferred from the remnants of what has been made to vanish. The task, then, for the philosophical commentator on Mallarmé’s work is essentially reconstructive insofar as philosophy “presupposes that the absence be restituted (*i.e.*, the thinking, under the sign of Truth, of the operations

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\(^{21}\) *Ibid.*, 49.
of a thought).”22 The titular dice-throw of *Un coup de dés*, then, in Badiou’s estimation would be no less than this very same present-absence, held in infinite deferral by Mallarmé’s subtractive gestures. At the very surface of the Badiouan situation, “the void of Being only occurs [...] by way of the event” 23 *qua* subtractive, inassimilable surplus-nothing that eludes all ontology.

Indeed, coursing through his valorization of subtraction in Mallarmé is the same commitment to nothingness that has been subject to the well-worn criticism that Badiou has never quite been able to break with his original commitment to Lacan’s thinking of the psychical generativity of the traumatic lack. If in Lacan the *objet petit a* serves as the symbolically inaccessible motor that sets desire in motion, Badiou’s ontology likewise requires an originary void to undergird Being itself. This requirement is bound up in Badiou’s commitment to the Zermelo-Fraenkel set theory as “the science of being *qua* being.”24 Among the fundamental assumptions of this particular set theory is the axiom of comprehension, which Badiou takes to postulate that “a property only determines a multiple under the supposition that there is already a presented multiple.”25 In other words, if to exist is to belong to a set, there must be an originary set to which all other sets refer. Lest he lapse into onto-theology, Badiou finds in his set theory the existence of the empty set, which allows him to build Being up from the void. In a radically atheistic turn, Badiou perverts the

22 Ibid.
25 Ibid., 45.
ancient problem of the uncaused cause by claiming that it is a divine *inexistent* or a void in the place of God that grounds Being. Responding, then, to Heidegger's famous question, "Why are there beings at all instead of nothing?," Badiou argues that it is *due to* a nothing—*i.e.*, due to the empty set—that there are beings, and it is only insofar as the event is faithful to this void that the event can transpire.

For Badiou, the event is part and parcel with an ontology that mirrors the Lacanian valorization of the lack and thus the application of Deleuze, a serious critic of Lacan, would necessarily be inadequate and inaccurate on the subject of Mallarmé. For Deleuze, the event is anything but subtractive inasmuch as he refuses the primacy of the void in favor of an image of Being as always shot through with difference in its plenitude. Though the words that Deleuze uses to refer to the eruptive emergence of the ‘new’ range from event, machine, fold, and image across his texts, as Clayton Crockett observes, “the event can be generalized to refer to what Deleuze means by *becoming*, which is also a production rather than something that simply happens.” Regardless of how it is named, in each case the event is *productive* of something and stands in opposition to subtraction as an immanent evolution or mutation within an already full field of Being, rather than a return to an ontological *tabula rasa* in each case. For the Deleuze and Guattari of *Anti-Oedipus*, “the real is the end

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product, the result of the passive syntheses of desire as autoproduction of the unconscious,”
and here we see, contra Badiou and Lacan, the production of the Real not on the basis of some reading of desire as “a relation of being to lack,”
but rather as the result of an intensive force of becoming in its desirous fullness: “Desire does not lack anything,” they argue. 
The field upon which the event emerges is never empty and always eludes subtraction. However, we do not yet know what it means for the dice-throw to affirm Being’s plenitude.

The opposition between these two thinkers takes the form of what Lyotard has called the differend. The apparent lack of a common ground upon which Deleuzian production can be fought out against Badiouan subtraction suggests to the reader that at hand is a conflict “that cannot be equitably resolved for lack of a rule of judgment applicable to both arguments.”

These two thinkers constitute two valences, distinct on foundational grounds, of a radically new ontology of the event and of multiplicity that has as its precursor a very similar differend that transpired in late nineteenth century mathematics.

On one hand, Badiou’s set-theoretical meditations bear the mark of the staid rigor of the Weierstrassian program, which was an instance of methodological conservatism that insisted upon limiting mathematical practice to, as Jamie Tappenden writes, the search for “explicit representations of functions and

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explicit algorithms to computer their values.”\textsuperscript{32} The crux of the Weierstrassian program, as will be elaborated in chapter three, was to be found in the attempt to sanitize mathematics of intuition, which would be replaced with formal manipulations. Likewise, Badiou’s subordination of ontology exclusively to the formalism of set theory suggests a theoretical reticence to think beyond the unidirectional \textit{reduction} of the discourse on being \textit{qua} being to one particular form of mathematical thought, the aforementioned Zermelo-Fraenkel axiomatic set theory. On the other hand, we have, as Deleuze self-referentially notes of British empiricism, the “free and wild creation of concepts.”\textsuperscript{33} Deleuze’s celebration of Riemann throughout his major work, \emph{Difference and Repetition}, is no mere coincidence insofar as conceptual production and deformation was fundamental to the revolution in mathematics that inaugurated by Riemann. Indeed, that which Tappenden observes to be crucial in the Riemannian approach—\textit{viz.}, its focus on “[describing] functions in terms of general properties, and to prove indirect function existence results that need not be tied to explicit representations”\textsuperscript{34}—is instantiated in Deleuze’s thinking, which rests upon a generalized conceptual dynamism that comprehends the ascents and descents of difference in a mode that contests the Badiouan and Weierstrassian reductions of thought to a series of tautologies that stand in relation to a single,

\textsuperscript{34} Tappenden, “\textit{Proof Style and Understanding in Mathematics I: Visualization, Unification, and Axiom Choice},” 149.
putatively universal set of axioms. To try to take up the Deleuzian project in the idiom of Badiou’s reductive move—or to do the same with Badiou’s work—is, following Lyotard, to make of one or the other a theoretical personage who “is divested of the means to argue and becomes for that reason a victim.”38 We lack a transcendental rule of judgment with which we might think Riemann against Weierstrass or Deleuze against Badiou without making recourse to an unjustified reduction, a decision to construe a philosophical or mathematical system in an idiom entirely alien to its design when both exhibit some degree of efficacy in their application.

Given this differend, we are in a bit of a bind. In what way shall we approach the line of difference between Badiou and Deleuze on the dice-throw such that we make neither into a victim of our interpretative framework, given that we have no transcendental law of the event? At least on a transitory basis, our method will take the form here of the critical apparatus of non-philosophy developed by Laruelle, an autonomous theoretical practice that seeks, as Ray Brassier notes, “not to supplant or eliminate philosophy but rather to use it as a material and object of study.”39 The differend at play in the establishment of the line of radical, seemingly incompossible difference between Badiou and Deleuze is precisely a symptom of what Anthony Paul Smith observes to be the Laruelleian ‘philosophical decision’—that which carves out a niche for a given philosophy through a process of “self-grounding, a making of philosophy that

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38 Lyotard, The Differend, 9.
39 Ray Brassier, Nihil Unbound: Enlightenment and Extinction (Basingstoke, UK: Palgrave Macmillan, 2009), 120.
turns it, and it alone, into a divine being, self-constituting and self-sufficient unto itself."\textsuperscript{40} This process of making one's philosophy sovereign and self-sufficient is, as Smith suggests of Laruelle's work, the "invariant structure organizing all philosophical endeavors."\textsuperscript{41} Following Smith, we now have the means to develop a 'science of philosophy' that "allows the non-philosopher to use philosophy as material within a wider theoretical framework."\textsuperscript{43} The study of these decisional invariants permits the inhabitation of the Badiou-Deleuze differend in a manner that allows us to bring forth a Mallarmé and a mathematics that are not reduced to a means by which philosophies assert their territorial sovereignty—but are rather thought of in a way that is expansive and generative of a genuinely plural, evental, and diverse ontology. The task, as it stands, is to parse through Badiou and Deleuze on mathematics and Mallarmé with an eye to these invariants.

While both Badiou and Deleuze have valorized many of the same decisional criteria (\textit{i.e.}, both announce their intention to think from the perspective of the multiple, both take up the political as a condition of the ontological) from the beginning of their projects, the stakes of the fundamental reductions at play—ontology to mathematics, \textit{Being as plenitude}—gained explicit textual body three years after the publication of Badiou's magnum opus, \textit{Being and Event}. It was then that Badiou and Deleuze began a sustained epistolary exchange in which their forms of practicing philosophy would be fought out on

\textsuperscript{40} Anthony Paul Smith, "Thinking From the One: Science and the Ancient Philosophical Figure of the One," in \textit{Laruelle and Non-Philosophy}, ed. John Mullarkey and Anthony Paul Smith, Critical Connections (Edinburgh: Edinburgh UP, 2012), 22.


\textsuperscript{43} Smith, \textit{A Non-Philosophical Theory of Nature}, 62.
the terrain of a discussion of the event and of multiplicity. Though these letters have reputedly been lost due to Deleuze’s frustration with the exchange, Badiou’s *Deleuze: The Clamor of Being* (2000) serves as a “long posthumous letter” to Deleuze, a dénouement that takes up the task, in Badiou’s estimation, “of completing the incompletable: a conflictual friendship that, in a certain sense, had never taken place.” Yet, this would be a unilateral completion—a completion that would be Badiou’s attempt to foreclose on Deleuze and the Deleuzian camp *tout court* and to get in the final word.

Their (non)relationship was indeed conflictual even before it had taken any serious textual form. These letters were not the first time that Badiou and Deleuze found themselves in a protracted theoretical conflict. The two of them were colleagues in the philosophy department at the experimental university at Vincennes from Deleuze’s arrival in 1970 to his retirement in 1987. Over the course of nearly two decades, differences in politics and in philosophy invariably came to the forefront.

In the early years at Vincennes, Badiou, a leader at the time of a small Maoist contingent and responsible for the publication of a Maoist journal, the *Cahier Yénan*, was exemplary of the general philosophical and political inclinations that were predominant at Vincennes and which would long be hostile to the critical aims expounded by Deleuze for much of his career. Badiou was hired by Foucault in 1969 along with many of his colleagues at the *Cahiers pour l’Analyse*, and, as such, was certainly not the only acolyte of Althusser and

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Lacan at Vincennes. Among many others were Jacques Rancière, François Regnault, and Lacan’s daughter, Judith Miller. Writing of the intellectual climate at Vincennes in these early years, François Dosse observes, “The dominant chord was [...] structuralist and Maoist,” though the presence of the Trotskyist Henri Weber and Étienne Balibar, then a member of the Parti communiste français, attested to some flexibility vis-à-vis the dominance of Maoism, if not some form of mainstream Marxism.45 Following his publication with Félix Guattari of the radically anti-Lacanian Anti-Oedipus (1972) and Rhizome (1976), which served to establish their work as in profound opposition to the psychoanalytic Marxism in vogue at Vincennes, Badiou publically attacked his colleague as a reactionary and a fascist.46 In “Le flux et le parti” and “Le fascisme de la pomme de terre,” both published in 1977 in the Cahier Yénan, Badiou identified Deleuze and Guattari as “the leaders of the anti-Marxist troop [who] openly attack the central dialectical principle: one divides into two.”48 For the Badiou of 1977, the ontology sketched in Rhizome bespoke nothing less than idiocy on the parts of Deleuze and Guattari, for “only a cretin could confound the Marxist dialectical formula ‘one divides into two’ with the arborescent, familial généalogisme established in the Deleuzo-
Guattarian proposition that ‘one becomes two’.” And yet, despite this vitriolic disavowal, Badiou could not escape from the profound influence that Deleuze was to have on the French intellectual situation. As Badiou went on to write his more heavily philosophical texts in the 1980s, he found in Deleuze an enduring and formidable counterpoint that he could not help but account for in his thinking of novelty, multiplicity, and the event.

After Deleuze’s death, a strange form of nostalgia tempered Badiou’s hostile regard for his now preterit foil. Despite the polemical tone of Badiou’s early critiques of Deleuze’s work, the timbre of their non-encounter in The Clamor of Being seems to be much closer to Derrida’s elegiac conclusion to his adieu to Deleuze. Badiou, like Derrida, mourns the necessity of “wandering all alone” in a long conversation that he was never quite able to have with Deleuze. It is not an understatement to say that Badiou’s text is one of the most effective syntheses of Deleuze’s work, painted in the masterful theoretical strokes for which Badiou has become famous. Nonetheless, The Clamor of Being was not an attempt to charitably find himself in continuity with Deleuze: it is, at degree zero, a profoundly critical engagement that teeters on the frontier between theoretical intervention and character assassination. As José Gil notes, “[The Clamor of Being] is not ‘happy’, but heavy, massive, repetitive. It weighs on the mind of the reader, as if [Badiou] wanted to twist a single, obsessive truth:

49 Ibid., 45. “Seul un crétin peut confondre la formule dialectique marxiste ‘un se devise en deux’ avec le généalogisme pour arbre de famille que recouvre l’énoncé deleuzo-guattaresque ‘un devient deux’.”

Deleuze’s philosophy is a metaphysics of the One.”\textsuperscript{51} While, stylistically, \textit{polemos} seems to have given way to \textit{logos} between the Badiou of the \textit{Cahier Yénan} and the Badiou of \textit{The Clamor of Being}, evident between these texts is the persistence of a dogged pursuit of Deleuze interpellated \textit{a priori} as a patrician metaphysician who promulgates a “philosophy [that] is organized around a metaphysics of the One.”\textsuperscript{52} Badiou’s commitment to this particular reading reduces the complexity of Deleuze’s thought by means of an interpellative decision. According to Badiou, Deleuze’s thought is only self-adequate insofar as it is the thought of the One—and it is a thinking of the One because it is not a sufficiently radical break with Bergson and, ultimately, Plato \textit{qua} the thinking of the One.

The task of the present attempt to surpass the differend of the dice-throw is threefold. In chapter two, we will explicitly work through what Badiou sees as the ontological commitments that, in his estimation, undergird the Deleuzian precomprehension of the dice-throw under the sign of the One. I will, moreover, elaborate how Badiou’s interpellation of Deleuze as an orthodox Bergsonist effaces crucial aspects of Deleuze’s thinking of temporality. Following from this critique of Badiou’s over-Bergsonizing tendencies, I will propose in chapter three an interpretation of Deleuze’s relationship to mathematics that prioritizes not Bergson, but rather Deleuze’s heterodox readings of Martin Heidegger and the French philosopher of mathematics Albert Lautman. Nevertheless, I will


\textsuperscript{52} Badiou, \textit{The Clamor of Being}, 17.
show that, even with this charitable interpretation, the Deleuzian model falls short in the sense that he never fully integrates mathematics into his thinking, thereby failing to critically account for what Iain Hamilton Grant has identified as the “exclusive disjunction [of] ‘number or animal’ dominating the metaphysics of nature.” 53 Finally, in chapter four, I will propose an entanglement of contemporary work in mathematics and *Un coup de dés* that will serve as materials toward a transitory ontology of the Mallarméan constellation and event that, while educated by Deleuze and Badiou, is fundamentally relational, local, and critical of attempts to assume *a priori* a distinction between mathematical formalism and the play of poetry.

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2. ‘So Near! So Far!’:
Badiou’s Deleuze

Like the ‘good little boy’ of Freud’s *Beyond the Pleasure Principle*, Badiou plays *fort-da* with Deleuze. Denouncing his theoretical and mathematical sophistication, Badiou casts Deleuze away from him—but a thin string joins both of them, and Deleuze is allowed to reappear, but only when and in the manner that Badiou allows. Indeed, as Brassier notes, *The Clamor of Being* is characterized by a move in which Badiou establishes a relationship between Deleuze and himself “that simultaneously combines intimate proximity and irreducible distance.”† Both extensively treat the logic of the dice-throw, establish a philosophy of the event, and offer rigorous and novel accounts of multiplicity in their work. And yet, as Brassier goes on to suggest, “[It] would be difficult to contrive a greater contrast than that presented by the manner in

which those competing claims are staked out.”² As far as Badiou is concerned, this contrast is the expression of a very simple theoretical decision. Does one commit oneself to “the ‘vital’ (or ‘animal’) paradigm of open multiplicities (in the Bergsonian filiation)” or to “the mathematized paradigm of sets, which can also be qualified as ‘stellar’ in Mallarmé’s sense of the word.”³ Here, Badiou references a specific moment of disjuncture at the beginning of the twentieth century between Henri Bergson and Léon Brunschvicg. On the one hand, we have Bergson’s famous Oxford lectures of 1911, which would ultimately appear in his La pensée et le mouvement (1934), and, on the other, Brunschvicg’s pioneering Les étapes de la philosophie mathématique (1912). These two works constitute, for Badiou, the “fundamental division”⁴ in recent French philosophy. The Bergsonist mode, that of “vitalist mysticism,”⁵ passes through Canguilhem, Foucault, Simondon, and Deleuze; their inheritance is “a philosophy of vital interiority, a thesis on the identity of being and becoming; a philosophy of life and change.”⁶ The Brunschvicgian heritage, that of “mathematizing idealism,” passes through Cavaillès, Lautman, Desanti, Althusser, Lacan, and Badiou himself.⁷ This, according to Badiou, is the “philosophy of the mathematically based concept: the possibility of a philosophical formalism of thought and of the symbolic.”⁸ Here, Badiou is recapitulating a well-worn slogan of the Cahiers pour l’Analyse: each issue would open with an epigraph drawn from Gaston

² Ibid.
⁵ Badiou, Logics of Worlds, 7–8.
⁷ Badiou, Logics of Worlds, 7–8.
Bachelard’s *La Philosophie du Non* that situated in advance the high structuralist project as ‘working a concept’ against a formal backdrop. If one is not working to generalize a concept in a rigorous philosophical context, one is guilty of the “abdication of thought”9 that is phenomenology.

On a more philosophical level, however, insofar as it is only in the language of mathematics that philosophy can be sutured to the void, the evental stellarity of Mallarmé’s constellation, read by Badiou with emphasis on the sense in which the Mallarméan (non-)event is “accomplished in view of every null result,”10 is only ever thinkable for Badiou *qua* some “abolished plenitude.”11 If one is to ‘work the concept’ of this abolished plenitude, Badiou holds, one will find that it is only expressible in the formal analysis of the concept rendered possible by mathematics. For Badiou, the Bergsonian logic of the vital and animate world can neither explicate the abyssal logic at play in the subtractive void established at the heart of the maître’s shipwreck, nor can it think the multiplicity of the dice-throws as anything other than the realization of some becoming. In a sense, the battle is over definition and language. *What* is a multiplicity and *how* ought we characterize it—is it Badiouan/extensive or Deleuzian/intensive? *What* is an event and in what language shall we speak of it—is it subtractive or productive? In what tradition should we find ourselves? Bound up, however, in what seems to be effectively a semantic debate are a range of ontological commitments no less substantial than those sutured into

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Heidegger’s investigation into “what we really mean by [the] expression ‘Being’.” The stakes, as much in Heidegger as in the case of Deleuze and Badiou, are likewise no less than the question of how or to what extent we ought to appropriate—or break with—the Platonic vision of Being.

Given these high ontological stakes, we must regard critically Badiou’s proposed exclusive disjunction between Brunschvicg and Bergson, which is mobilized throughout _The Clamor of Being_ as a rather dubious means to lend weight to Badiou’s claim to be Mallarmé’s intellectual heir. Indeed, much of Badiou’s critique of Deleuze hinges upon this move in which he claims that Deleuze simply has chosen the wrong influences. On this reading, Badiou asserts that if Deleuze had only adopted Brunschvicg’s sober formalism instead of the wild play of Bergsonism, he could have escaped his hidden fidelity to the One. Enacted here is the troublesome binary of ‘animal or number’, equally comprehensible in terms of ‘formalism or life’, that we have partially rehearsed above. Insofar as Mallarmé takes pride in the dispersion he effects in _Un coup de dés_, the foam generated not only in the frenetic play “of a ship listing to starboard or larboard,” but also in the “variable motion of the writing” so essential to Mallarmé’s project, this binary disjunction is already destabilized. _Un coup de dés_ overdetermines its formalism in play in the sense that the emergence of the formal matheme— _LE NOMBRE_ —is conditioned by the locus of the shipwreck, enclosed by the organic and frothing sea. It is neither the case that

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13 Mallarmé, “Coup de Dés,” 128. “…un bâtiment penché de l’un ou l’autre bord” (129).
14 Mallarmé, “Preface (to Un Coup de Dés...),” 122. “…la mobilité de l’écrit...”
formal sobriety is the only condition under which Un coup de dés can be thought, nor is it that a purely Bergsonian thinking of élan vital uncovers some hidden plenitude at the heart of the Mallarméan project. It is rather that some ‘fold’ between play and stable formalism is necessary. However, the possibility of such a fold is invariably occulted by Badiou’s commitments to render Deleuze as a static thinker, a disciple of Bergson and a handmaiden of the One. To assess the extent to which this is permitted within Deleuze’s framework, we must first rescue Deleuze from the overdetermining shadow of Badiou’s interpretation.

Early in the first substantial chapter of The Clamor of Being, Badiou makes clear the very reading that he will pursue in different modes throughout the rest of his text. He writes, decisively, that “Deleuze’s fundamental problem is most certainly not to liberate the multiple but to submit thinking to a renewed concept of the One.”¹⁵ In contradistinction to Deleuze’s expressed goal of taking up Nietzsche’s conception of the task of future philosophies as ‘reversing Platonism’, Badiou, on the contrary, sees in Deleuze a “makeshift Platonism,” or, in other words, a failure to liberate philosophy from the dominance of the One in any significant way.¹⁶ As Badiou goes on to remark, “Deleuze retains from Plato the univocal sovereignty of the One.”¹⁷ However, for the reader sympathetic to Deleuze’s project, it seems inconceivable that Deleuze, a thinker sui generis in his consideration of “multiplicities for their own sake,”¹⁸ would have been so

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¹⁵ Badiou, The Clamor of Being, 11.
¹⁶ Ibid., 45.
¹⁷ Ibid.
misguided in his search for difference in itself that he would have sunk back into the Platonic hole from which he sought to escape. Nevertheless, Badiou’s argumentative strategy becomes clear upon a consideration of the logic of the dice-throw. While Badiou identifies four distinct doctrinal series at play in Deleuze’s work—that of the ‘doctrine of the event’ (the virtual and the actual), the ‘doctrine of knowledge’ (time and truth), the ‘doctrine of action’ (chance and the eternal return), and the ‘doctrine of the subject’ (the fold and the outside)—if we are to take *The Clamor of Being* as a dispute over the ontological status of multiplicities and events as suggested by Badiou’s posited either/or of Bergson versus Brunschvicg above, what seems evident is that it is both possible and philosophically useful to collapse these series into the differend of the dice-throw. The treatment of dice-throw is itself a project of characterizing multiplicity insofar as the question of the throw of the dice bespeaks the quasiquantitative, if subjunctive, dimensions of Mallarmé’s poem. The question of the plural arises in asking the question of number. How many dice find themselves thrown, how many inferences can the master draw, how many whirlpools are circumscribed by the fluttering of the “solitary distraught feather,” how many Sirens obliterate the material memory of the event?

Before working through Badiou’s assessment of the difference between his conception of the dice-throw and that of Deleuze, some philosophical preliminaries must be worked out. Under Badiou’s reading, a certain conception of the eternal return, coupled with Deleuze’s interpretation of Duns Scotus’

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principle of the univocity of Being, provide the essential seed of the Deleuzian project. While critics\textsuperscript{21} have charged Badiou with understating the role that Nietzsche plays in Deleuze’s thought, Badiou’s attention to the dice-throw bespeaks an attention to this very question. As Badiou states, “One can argue that most of Deleuze’s work is devoted to defending, unfolding, and understanding ever more comprehensively the founding intuition of Nietzsche concerning the eternal return.”\textsuperscript{22} This very concept of the eternal return is essential to his rather heterodox understanding of Deleuze’s work insofar as, under Badiou’s reading, the fundamental nature of Deleuze’s overcoming of Kant in his syntheses of time is reducible not to the expressed triad of habit, memory, and death\textsuperscript{23} but rather merely as the opposition between the present and the past as memory. If “the past is a positive production of time” for Deleuze, and if Deleuze’s high classicism takes its form in this moment “when \textit{the temporal power of the false} is thought, according to an essential and particularly difficult intuition, \textit{as one and [the] same thing as the eternity of the true},” Badiou suggests, “this is an eternity of which the mode of being is (eternal) return.”\textsuperscript{24} Badiou must construct a particular kind of eternal return in order to maintain some semblance of fidelity to Deleuze’s project while also licensing his misreading of the syntheses of time. This is an eternal return thought under the condition of

\begin{flushleft}\textsuperscript{21} For instance, Crockett (2013).  \\
\textsuperscript{22} Badiou, \textit{The Clamor of Being}, 67.  \\
\textsuperscript{23} This particular triad is more than suggested, of course, in what Badiou might identify as a ‘naïve’ reading of \textit{Difference and Repetition}. In chapter 2 of \textit{Difference and Repetition}, Deleuze posits that time is synthesized in a triadic fashion: first, in the composition of habit (Husserl and Hume); second, in the production of memory (Proust and Bergson); and third, in the establishment of the ‘pure and empty’ form of time, \textit{death}, that indicates the eternal return (Kant and Nietzsche). See Crockett (2013), pp. 33-4.  \\
\textsuperscript{24} Badiou, \textit{The Clamor of Being}, 61.\end{flushleft}
the univocity of Being, which entails a very particular form of recurrence. Here, the return cannot differ in ontological status from what returns inasmuch as, under Deleuze’s reading of Scotus, we cannot admit Aristotle’s dictum that “Being is said in various senses,” according to the various categories (here, perhaps, of the return and what is returned). For Badiou, this amounts to saying that while there may exist multiple forms of being—i.e., ‘formal’ and ‘real’ distinctions, which will become important below—these various forms bespeak nothing other than what Badiou identifies as a “supereminent One,” or the virtual, which Badiou (problematically) reads as a ground for what is actual. In short, Badiou claims here that the split submergence of objects into the actual and the virtual in Deleuze’s work—that is, the extent to which an object’s totality is never entirely given in the empirical world (i.e., the actual) but is also given in the generative play of intensities in an equally real yet non-actualized field (i.e., the virtual)—renders paradoxical Deleuze’s thesis of the univocity of Being. On Badiou’s reading, this virtual field is singular, and, inasmuch as he reads it as the ground for actualized objects, it amounts to thinking Being as One. Badiou goes on to argue, “The virtual is the very Being of beings, or we can even say that it is beings qua Being, for beings are but modalities of the One, and the One is the living production of its modes,” and it is in this sense that he identifies in Deleuze “a Platonism with a different accentuation.” For Badiou’s Deleuze, the multiple is a question of ‘mere’ form that is always subtended by the real-as-One.

27 Ibid., 48.
28 Ibid., 26.
This particular interpretation of Deleuze’s thought induces Badiou to see in him “an ontological precomprehension of Being as One,”\(^\text{29}\) that fundamentally precludes a ‘legitimate’ thinking of Mallarmé. As Badiou argues, “absolutely no compromise is possible between Deleuze’s [Bergsonist] vitalism \([i.e., \text{his fidelity to the becomings of the real-as-One}]\) and Mallarmé’s subtractive \([i.e., \text{putatively Brunschvicgian}]\) ontology.”\(^\text{30}\) Deleuze may be writing about a dice-throw, Badiou seems to say, but it surely is not the dice-throw of the *maître*.

Given this exclusion from ‘properly’ Mallarméan thought, the *Deleuzian* “true throw of the dice”\(^\text{31}\) has, according to Badiou, three essential characteristics. It is (1) *unique*; (2) affirmative of the *totality* of chance; and, for all of the actually distinct throws, (3) the *same Throw returns*. The stakes of these criteria, however, are not altogether clear at first glance. For Badiou, what is essential is no less than the effective role played by the univocal eternal return in Deleuze’s philosophy—and the particular interpretation of the eternal return that Deleuze hopes to defend. This interpretation (or, rather, Badiou’s interpretation of this interpretation) might be best elucidated not directly, but in going through the negative moves that make up the bulk of Badiou’s chapter on the subject. In this vein, there are at least three ‘misinterpretations’—a Parmenidean misreading, a legislative (Kantian) misreading, and a frequentist misreading—identified by Badiou of the eternal return that are not, in his opinion, satisfactory renderings of Deleuze’s position.

First is the Parmenidean reading under which the One figures “as a sort of subject of the eternal return.”\textsuperscript{32} The One itself re-occurs, and it recurs eternally, insofar as the One is thought of as having a transcendent position \textit{vis-à-vis} the multiple. This is to say, here the One returns and the multiple is taken up in this mode of returning as a degraded or corrupted version of the One. In each cycle of return, the distortion of the multiple is “recalled to its essential being” and rectified by virtue of the return of the Same.\textsuperscript{33} Yet, even under a just interpretation of his work, this is an unacceptable reading of the eternal return for Deleuze. Being here is taken as equivocal insofar as, under Badiou's reading, “[Being] is said of the One as of what returns, and of the multiple as of what must not return.”\textsuperscript{34} The thesis of Being's univocity forecloses on any possibility of the return of the One in the sense that, as Deleuze writes, “[If] it were the One which returned, it would have begun by being unable to leave itself.”\textsuperscript{35} Insofar as the One would have to become absent to itself in order for it to return, it would have to be subject to some internal work of the negative; as Badiou notes, “Being [...] would then be said according to at least two senses: the coming-out-of-itself and the return, immediacy and negation, externalization and internalization.”\textsuperscript{36} In that it violates this central Deleuzian tenet of univocity, the eternal return cannot be understood here as the repetition of the One as such.

\textsuperscript{32} Badiou, \textit{The Clamor of Being}, 68.
\textsuperscript{33} \textit{Ibid.}
\textsuperscript{34} \textit{Ibid.}
\textsuperscript{35} Deleuze, \textit{Difference and Repetition}, 126.
\textsuperscript{36} Badiou, \textit{The Clamor of Being}, 69.
The second unsatisfactory reading, effectively understood as the 
*legislative interpretation*, suggests that it is not the return of the One itself, but rather that it is more along the lines of a “formal law imposed on chaos.”

There would then be two principles that govern the becoming of the world. First, there would be chaos or dissolution, and, subsequently, a legislative regularization or “restoration of the Same.”

This, however, would smack of Platonism for Deleuze. It cannot be the case, following Badiou’s interpretation, that the eternal return would amount to a law that is “forcefully applied to a rebellious matter” without this law becoming a transcendent principle. As Deleuze holds in *The Logic of Sense*, such a reading of the eternal return “represents [...] the manner in which chaos is organized by the action of the demiurge, and on the model of the Idea which imposes the same and the similar on him.”

The conclusion, resonant with Aristotle’s hylomorphism, that the eternal return may be conceived of as the diremption of *ousia* into form and matter is entirely unacceptable to Deleuze. While, as Badiou’s reading of Deleuze suggests, every object is inherently split into its actual and virtual parts, “it is absolutely excluded [...] that the two parts of the object come under different principles.”

It cannot be that form returns while matter is discarded, since this would be to say that that form exists in a transcendent mode apart from the corrupt mode in which matter temporarily subsists.

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The third and final unsatisfactory reading—the algorithmic interpretation—suggests that there exists, as in the probability theory, some form of statistical regularity that governs chance. This would be a tendency toward equilibrium, as in the way that the law of large numbers regulates outcomes for a sufficiently long series of coin flips. To be precise, a short series of coin flips may give us the sense that there is no such thing as statistical regularity—over the course of five tosses, we might obtain ‘tails’ five times in a row in contradistinction to our expectation that we would obtain an equal number of ‘heads’ and ‘tails’ results. Yet, as the series grows, the number of ‘heads’ results will approach the number of ‘tails’ results, and as we tend toward an infinite series of datapoints, we will also tend toward perfect equilibrium. This, for Badiou’s Deleuze, is not what is at play in the eternal return. As Badiou writes, “[If] the question of chance, the game, or the dice throw is of such significance for Deleuze (as it is for Mallarmé and Nietzsche), it is because he seeks—and this is of the utmost importance for him—to refute the probabilistic conception of the eternal return and to maintain the rights of divergence within the very heart of the infinite power of the One.”

Emphasized here is precisely the question with which we opened this chapter—the reason why the dice-throw sits at the heart of Deleuze’s événementalité. It is rather clear that the dice-throw serves to make possible an understanding of the event as a non-deterministic yet recurrent happening that keeps open the constant possibility of the emergence of the new in the midst of the same. As Badiou writes, “Deleuze wants, against

\[42\] Ibid., 72. Emphasis mine.
probability theory, both to maintain the figure of the game of chance and to withdraw it from the jurisdiction of the Same. Or, conversely, he wants to assume the motif of the eternal return, without ever sacrificing chance.” In order for this to be the case, we must refuse this statistical reading of the eternal return that implies the possibility of the entropic exhaustion of recurrence. Deleuze, critiquing elsewhere this progression to equilibrium writes, “Nietzsche’s account of the eternal return presupposes a critique of the terminal or equilibrium state. Nietzsche says that if the universe had an equilibrium position, if becoming had an end or final state, it would already have been attained.” In this sense, Badiou suggests, were this algorithmic interpretation correct, the power of the eternal return would not reside in difference, but in identity insofar as “it would not be [the] disequilibrium of the virtual, but [the] equilibrium of the actual” that would dominate the structure of recurrence. Yet, Badiou is unable here to show in any rigorous manner why it is the case that this particular misconstrual is intolerable to Deleuze because he has already denied the relevance of the third of the syntheses of time in *Difference and Repetition*. Badiou leaves this particular objection be, imbuing it with an air of impossibility and arbitrariness—and this is precisely because he fails to see how Deleuze intimately binds Kant and Nietzsche together on the topic of the eternal return. It is not that Deleuze’s interest in allowing for the emergence of the new is some sort of aesthetic or political preference, but rather that it is

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fundamentally bound up in his ontological commitments in terms of the synthesis of time.

Before addressing this strange Nietzsche-Kant alliance, however, we must revisit what Badiou sees as the three qualities of the ‘true’ Deleuzian dice-throw that we have outlined above—namely: unicity, totality, and that it is always the same dice-throw that recurs. This first criterion is bound up inextricably with the univocity of Being, which, as Brassier observes, “requires that there be only one throw.”46 If, as Deleuze posits, “the numerical distinction between ‘beings’ is a modal, not a real distinction,”47 how could it be otherwise for the dice-throw? Indeed, Deleuze goes on to observe, in the case of the dice-throw, “[the] throws are formally distinct, but with regard to an ontologically unique throw, while the outcomes implicate, displace, and recover their combinations in one another throughout the unique and open space of the univocal.”48 In short, while these formal distinctions between individual dice-throws are ‘real’ insofar as they are grounded in an object or in Being, the formal distinction between dice-throws “is not necessarily a numerical distinction because it is established […] between ‘formal reasons’ which may allow the persistence of the unity of the subject to which they are attributed.”49 As Scotus suggests, this formal distinction—what he would call the distinctio formalis a parte rei—bespeaks a metaphysics in which, given two instantiations of an object in reality, “These two realities cannot be distinguished as thing and thing […] Rather when in the same thing,

46 Brassier, “Stellar Void or Cosmic Animal?,” 201.
47 Deleuze, Difference and Repetition, 303–4.
48 Ibid., 304.
49 Ibid., 39.
whether in a part or in the whole, they are always formally distinct realities of the same thing.”50 Under Badiou’s reading, this ‘same thing’ is the originary dice-throw, the dice-throw as the primordial event of Being, which is always unique under the conditions of univocity. Moreover, were there several throws not in a formal but in an ontological sense, Badiou contends, “the statistical revenge of the Same would be ineluctable.”51 Deleuze requires that there exists a reservoir of novelty that can intervene into the actual series of dice-throws, even as “the second throw perhaps operates under conditions that are partially determined by the first, as in a Markov chain.”52 Each dice-throw is an individuation of a virtual dice-throw, which retains its unity even as it is formally divided into its actual instantiations. The univocity of the dice-throw is, then, not a univocity that suggests that all dice-throws are the same, but rather that the univocal thrust behind the formally distinct series of dice-throws is, as Deleuze argues in *The Logic of Sense*, “the single throw for all throws, a single Being for all forms and all times, a single insistence for all that exists, a single spirit for all the living, a single voice for every murmur and every droplet in the sea.”53 To suggest that the presence of this unique dice-throw bespeaks the constant return of the Same is to submit the dice-throw not to the logic of the univocal but rather to analogical equivalence.

This second criterion, that of *totality*, or the affirmation of chance as a whole, attends to this evasion of the algorithmic interpretation in a more substantial manner. Under Badiou’s reading, chance for Deleuze cannot consist in an actual series of throws, for this would again make chance subject to statistical law, determined in the last instance to be nothing other than the establishment of equilibrium out of chaos. Deleuze’s unique throw of the dice has the power of “affirming Chance, of thinking of chance in sum, which is above all not a principle, but the absence of all principle.”54 In order to forestall this submission of chance to algorithmic equilibrium, Brassier notes, “Deleuze must insist that the chance affirmed by the [unique] dice-throw is not that of its own probability or improbability, but rather that of all possible outcomes occurring simultaneously.”55 In each case, the actual instantiations of the dice-throw are partitions of this virtuality; the chance of all of these outcomes occurring in one throw, however, is made impossible—and statistical equilibrium is evaded insofar as there is always this one outcome that eludes subsumption.

Consider, finally, the last criterion, which speaks to the recurrence of the *same* dice-throw. As Badiou argues, “What eternally returns in each event [...] is the *original unique throw of the dice with the power of affirming chance.*”56 Recurring in each actual instantiation of the dice-throw is the affirmation of the whole of chance as the generic virtuality of the dice-throw. It is not a matter of the relative *possibility* of obtaining any one result, but rather the affirmation of

virtualized chance as “the eternal return itself [...] the affirmation of all chance in a single moment, the unique cast for all throws.”57 It is here that Badiou argues most profoundly for Deleuze’s commitment to the logic of the One. While, as we have shown, it cannot be that the eternal return is the return of the One, a supervenient law that regulates chaos in the name of the One, or the algorithmic tendency toward the One, Badiou holds that “chance is the One as eternal return, for what makes an event fortuitous is that it has as its unique active power, as its generic virtuality, that which returns—namely, the original Great Cast,”58 or, equivalently that “the eternal return is the One as the affirmation of chance, or affirmation of the fact that chance is affirmed in a single throw.”59 In a broader sense, what Badiou is suggesting is that Deleuze’s reading of the dice-throw bespeaks a larger commitment to the question of the event as an emission of the virtual, which is read here as a ground for the actualization of the emergence of anything novel. As Badiou notes, here is evidence that “chance is the affirmation, for Deleuze, of the contingency of the One in all its immanent effects.”60 Whereas, for Badiou, the event must always escape being made virtual inasmuch as its exclusion from a given situation establishes its evental character, the event, for Badiou’s Deleuze, is already given in a virtual form—and, in becoming actual, it can be said that this event is not genuinely evental insofar as it is only formally distinct from every other event. As Badiou argues, “For [Deleuze], the Idea is the virtual totality, the One is the infinite reservoir of dissimilar productions. A

57 Deleuze, The Logic of Sense, 180.
58 Badio
59 [Ibid.], 74.
60 [Ibid.], 76.
contrario, I uphold that the forms of the multiple are, just like the Ideas, always actual and that the virtual does not exist; I sacrifice, however, the One.” In other words, for Badiou’s Deleuze, if each component member of a multiplicity only differs formally from any other member, the multiplicity is reducible to the One insofar as these members are, ontologically speaking, nothing less than emissions of a virtual One.

However, the reading that we have elucidated above makes, as mentioned, a critical error. Badiou reads the non-eventality of the Deleuzian event as bound up in its fidelity to a past virtuality, which, while repeated in each event, must also preexist that event to the extent that Badiou argues for a reading of said event as the ‘pure emission’ of this virtuality. This is, fundamentally, a misconstrual of Deuze’s conception of time and a misreading of the extent to which the eternal return factors into much of Difference and Repetition. Inasmuch as Badiou is attentive only to the syntheses of past and present, he is able to authorize his reading of the past/virtual as ground because he is only able to see the past as “another time in which the first synthesis of time can occur,” or as an envelope or ground in or upon which the present can be made actual. To be clear, Badiou reads the totality of Deleuze’s thinking on time as follows:

Pure duration, the great total past that is one with the virtual, cannot be qualified as temporal because it is the being of time, its univocal designation according to the One. The different determinations of time

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61 Ibid., 46.
62 Deleuze, Difference and Repetition, 79.
are ‘sections’ of this duration—with the word ‘section’ always conveying, in Deleuze’s texts, a complete intuition of actualization.63

Whether past, present, or future, any such tense is read by Badiou to be some actualized portion of the virtual, which he reads in a predominantly Bergsonian fashion. Badiou interprets these particular ‘sections’ as the result of our attempts to “make extensity out of duration”64 through the thinking of tense, and are derivative, therefore, of some durational One. Though the habitual synthesis of the present takes place upon the ground of the past in *Difference and Repetition*, the synthesis of futurity is not thinkable in this fashion. While “it is always Eros [as present], the noumenon, who allows us to penetrate this pure past in itself, this virginal repetition which is Mnemosyne,”65 that which gives present-Eros the effective power to uncover the secret of past-Mnemosyne as the actualization of what has already been given in a virtual ‘pure duration’ is not already present in the dyad of present and past. While Eros does indeed tear virtual objects from the pure past in order for them to be actualized in lived experience, that which authorizes and makes possible this individuation—as well as provides the conditions under which the actualization of the past does not amount to mere recapitulation of that which has already been given—comes from without. If we are to merely accept the dyad, Deleuze argues, “we have not yet found the last word”66 in this matter.

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65 Deleuze, *Difference and Repetition*, 85.
66 Ibid.
The supersession of this dyad arises in Deleuze’s discussion of the passage from Descartes to Kant on the question of time. While, as Deleuze argues, the Cartesian subject attests to its existence within time (i.e., that Descartes’ metaphysics does the work of “reducing the Cogito to an instant and entrusting time to the operation of continuous creation carried out by God”\(^67\)), Kant’s contribution was to suggest that the manner in which the determined instance of the ‘I think’ was to be made compossible with the undetermined ‘I am’ was that the latter would be rendered determined by its situation within time.\(^68\) That is to say, as Deleuze writes, “[My] undetermined existence can be determined only within time as the existence of a phenomenon, of a passive, receptive phenomenal subject appearing within time.”\(^69\) It is in this sense that Deleuze cites obliquely Rimbaud’s famous cry, “Je est un autre,”\(^70\) insofar as the intervention of time here into the establishment of the subject signals equally the intervention of a line of difference into the Kantian subject. What was once, for Descartes, the unitary subject of the Cogito is now, for Kant, a split subject, at once empirical qua object of knowledge within time as well as active qua subject of transcendental apperception outside of time. As Crockett proclaims, “Time is the name of this split. Time is what allows for the transcendental synthesis of knowledge, but this synthesis only operates by means of a fracture and a death

\(^{67}\) Ibid., 86.
\(^{68}\) In short, the Cogito entails a move from something that is determined (my capacity to think) to something that is undetermined (the implication that I exist). What is not clear in Descartes, Kant holds, is how the move from that which is determined to that which is undetermined is possible.
\(^{69}\) Deleuze, Difference and Repetition, 86.
\(^{70}\) Arthur Rimbaud to Georges Izambard, May 13, 1871.
of self and of God.”\textsuperscript{71} This time-as-split, what Deleuze will call ‘the empty and pure form of time’, is what constitutes the third synthesis—that of the opening-up of the future, under the condition of death.

It is this third synthesis that liberates the event, \textit{pace} Badiou, from the overdetermination of the past/virtual. Alongside Bergson’s two repetitions of habit and memory intervenes Deleuze’s contribution, a repetition of futurity that is not apprehended as a dimension of the present, but rather an opening for “the absolutely new itself.”\textsuperscript{72} This rendering of futurity attests to Hamlet’s cry that “time is out of joint,”\textsuperscript{73} which, for Deleuze, points toward “time outside the curve that gave it a god, liberated from its overly simple circular figure, freed from the events which made up its content, its relation to movement overturned; in short, time presenting itself as an empty and pure form.”\textsuperscript{74} Here, time is no longer subordinated to the figure of movement, but rather, in its stasis, provides the conditions for novelty in excess of what is pre-given in the past. As Deleuze writes, under disjointed form of time, “Time itself unfolds (that is, apparently ceases to be a circle) instead of things unfolding within it (following the overly simple circular figure).”\textsuperscript{75} Futurity here “abjures [time’s] empirical content,”\textsuperscript{76} and here, as Deleuze argues, “the ground [of virtuality or pure time] has been superseded by a groundlessness, a universal ungrounding which turns upon

\begin{thebibliography}{9}
\bibitem{footnote1} Crockett, \textit{Deleuze beyond Badiou}, 35.
\bibitem{footnote2} Deleuze, \textit{Difference and Repetition}, 90.
\bibitem{footnote4} Deleuze, \textit{Difference and Repetition}, 88.
\bibitem{footnote5} \textit{Ibid}.
\bibitem{footnote6} \textit{Ibid.}, 89.
\end{thebibliography}
itself and causes only the yet-to-come to return.”77 The intervention of the future insures that the virtual past is not determinative of all of the individuations of the actual present. Indeed, as Zsuzsa Baross notes of *Difference and Repetition*, “[The past] bears no relation to a future powerful enough to haunt the present and to overturn the past, to throw time off its hinges or to overturn its ground.”78 Time, which is grounded in the subject, ungrounds itself from the perspective of futurity insofar as this time-as-split, this caesura in the subject, becomes the space from which novelty in the form of event and act emerges. Futurity runs in constant excess of all other time, always able to intervene in unforeseen ways. The absolutely new, then, “is in turn nothing but repetition: the third repetition, this time by excess, the repetition of the future as eternal return.”79 This repetition is conditioned by the (ontological) death of the coherent subject insofar as the novel event and the act “turn back against the self which has become the equal and smash it to pieces, as though the bearer of the new world were carried away and dispersed by the shock of the multiplicity to which it gives birth.”80 The condition of possibility for the new is the condition of the *impossibility* of the coherent self and, insofar as Deleuze has already identified past as pre-personal Id, the locus of habits, and present as narcissistic Ego, serves also as the abolition of what is temporally given as already virtual and actual. The eternal return, then, insofar as it is the repetition of this futurity,

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79 *Deleuze, Difference and Repetition*, 90.
cannot be, as Badiou would have it, the recurrence of the pre-given Great Cast as past reservoir of divergences. It is, rather, that the intervention of the eternal return “affirms everything of the multiple, everything of the different, everything of chance except what subordinates them to the One, to the Same, to necessity.” Repetition is driven by this eternal return of futural emptiness, instantiating in each recurrence the possibility of the emergence of the new and the ungrounding of the circularity of past and present in the death of the subject and of God. It is only ever that which will become different that returns, and it is always with an eye to the future that difference itself becomes.

What is essential here is a particular section from *Difference and Repetition* that Badiou cites in a truncated form throughout *The Clamor of Being*.

In the very last sentence of the conclusion, Deleuze writes of

> A single and same voice for the whole thousand-voiced multiple, a single and same Ocean for all the drops, a single clamor of Being for all beings: on condition that each being, each drop and each voice has reached the state of excess—in other words, the difference which displaces and disguises them and, in turning upon its mobile cusp, causes them to return.

Yet, in each case that Badiou cites this selection, he leaves out the ‘on condition’—and this ‘on condition’ is the reference to futurity that Badiou cannot or will not tolerate. Just as in the Mallarméan conditional, the outcome of the Deleuzian dice-throw depends on a very particular set of circumstances. This is

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82 As Crockett (2013) summarizes: “The first synthesis is the binding principle that founds time on the basis of a living present, the second synthesis in turn grounds present time on a pure past that becomes accessible as memory, and finally the third synthesis isolates time in itself as a pure ungrounded form through which to drive repetition [...] The affirmation of futural repetition as eternal return where only what becomes (different) returns suggests that Deleuze is not simply wedded to an inmemorial past, as Badiou claims’ (37-8).
83 Deleuze, *Difference and Repetition*, 304.
to say, for Deleuze, only that which becomes totally different can return, and in returning, everything becomes different. As Deleuze argues, “Eternal return affects only the new, what is produced under the condition of default by the intermediary of metamorphosis.” The virtual totality of the Great Cast that Badiou points to as that which is made to return in the dice-throw cannot return unless it is in each case novel and, if it were in each case novel, would not return unless this novelty were to reach a state of differential excess. The affirmation of the totality of chance is the affirmation not of a virtual reservoir of preordained outcomes, but rather an affirmation of “the point at which the ultimate origin [of the dice-throw] is overturned into an absence of origin (in the always displaced circle of the eternal return).” Though each actual dice-throw undoubtedly bespeaks a unique cast that is indeed univocal, the unique cast is in each case overturned as the One, which must be excluded from the return. The virtual is not, as Badiou suggests, an inescapable ground—it is, in each instance, threatened with exclusion from the dice-throw, even as the dice-throws themselves dance across the space of the univocal. Univocity here is only applicable insofar as it is this space of radical, futural novelty that must be spoken in the same voice as the quotidian.

Though Deleuze’s conception of the event and of the dice-throw is surely not beholden to the One, as Badiou would have it, we have not yet considered the possibility that Deleuze too enacts the decisional maneuver that seeks to recapitulate the dubious line of difference between animal and number,
Bergsonist vitalism and Brunschvicgian formalism. Indeed, to demonstrate that the Deleuzian event is simultaneously non-subtractive and not reducible to Bergsonism is but one half of the task, for we have only established that Deleuze is not genuinely a thinker of the One insofar as the virtual is never absent the threat of caesural novelty. We have not yet addressed Badiou’s more productive claim that his mobilization of set theory is the only language appropriate for the characterization of being qua being. I argue that Deleuze’s work, contra Badiou’s contention, is mathematically compatible with the properly Mallarméan thinking of the event in the sense demanded by a true fidelity to the dice-throw as a pure event, antecedent to any axiomatics. To be explored, however, are the implications of Deleuze’s refusal of Badiou’s singular vision of axiomatics—and, moreover, whether Deleuze’s mathematics offers a thinking of ontology that permits us to move beyond the tired opposition of animal and number.

In the opening lines of The Clamor of Being, Badiou contrasts his mathematical orientation to that of Deleuze. He writes, “Even when it came to mathematics—which, I recognized, keenly interested him—Deleuze’s preferences were for differential calculus and Riemannian manifolds, from which he drew powerful metaphors (and yes, I do mean metaphors). I preferred algebra and sets.”87 Even on the first page of his engagement with Deleuze’s thought, Badiou has already begun a construal of Deleuze’s relationship to mathematics that he would continue throughout his text. In Badiou’s estimation, while Deleuze may draw from mathematics to fill out his metaphysical toolbox,

87 Badiou, The Clamor of Being, 1.
he—at best—renders metaphorical the concepts that he appropriates. Daniel W. Smith identifies in Badiou’s attempt to establish himself as the thinker *par excellence* of mathematical ontology against Deleuze, his vitalist foil, “a double strategy of avoidance and displacement”\(^{88}\) at play. Insofar as Badiou is an ontologist of the multiple, and insofar as he holds that the only real ontological thinking of the multiple is mathematical, Badiou must necessarily show that Deleuze’s work is non-mathematical and that *a fortiori* Deleuze is not offering a genuine thinking of multiplicity.

Evident even under the most charitable reading of *The Clamor of Being* is that, as Gil notes, Badiou demands “in the name of the internal consistency of Deleuzian metaphysics that it be thinkable in his rigid and static framework.”\(^{89}\) In short, Badiou necessarily holds that “every [Deleuzian] figure of the type ‘fold’, ‘interval’, ‘enlacement’, ‘serration’, ‘fractal’, or even ‘chaos’ [has] a corresponding schema in a certain family of sets.”\(^{90}\) This move is exemplary of the false generosity of Badiou’s text. Under Badiou’s subsumptive model, there is room for Deleuzian thought insofar as it might be captured under an ontology predicated upon Zermelo-Fraenkel set theory (ZF) with its associated first-order classical logic. As Dosse argues and as we have shown to some extent in the preceding pages, “Badiou [in *The Clamor of Being*] produced a sort of pure Deleuze, an essence of Deleuze passed through a filter, an idea of Deleuze

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\(^{89}\) Gil, “Quatre Méchantes Notes Sur Un Livre Méchant,” 71. “[Il écrit] au nom de la cohérence interne de la métaphysique deleuzienne de l’être qui exige qu’on la pense dans son cadre rigide et statique.”

\(^{90}\) Badiou, *The Clamor of Being*, 47.
without Deleuze,91 a Deleuze with neither his third synthesis of time nor his mathematical interests in any significant sense. Given Badiou’s meta-ontological requirement that mathematics is ontology, and given his conceit that axiomatic set theory is the precise language in which this meta-ontological requirement is practicable, it is unsurprising that Badiou holds in reserve this logical reduction to set theory as a key element of his annulment of Deleuze’s mathematical inheritance. Against the Deleuzian reading, instructed by Albert Lautman’s work, of mathematics as comprising a complex conceptual topography of ascents to generality and descents to particularity, Badiou has established ab initio a flat Cantorian universe of reductions and tautologies as the terrain upon which the ontological stakes of Deleuze’s thought might be fought out. This is, substantially, the fundamental reduction from which all of Badiou’s reductions follow: in that multiplicities are ‘naturally’ expressible in ZF, subtended with the usual first-order classical logic, all multiplicities must be reduced to the static formalism of constant sets. Possibility here implies normative necessity inasmuch as the descriptive adequacy of Badiou’s particular language is taken to entail the necessity of its use as a transcendental field upon which philosophical debates must be evaluated. But does this not beg the question? We are induced to conclude that a ZF-based mode of thinking is superior to Deleuze’s model, but only in presupposing—if implicitly—the adequacy of ZF in this particular setting, or in construing all of Deleuze’s figures as effectively tautological insofar

91 Dosse, Intersecting Lives, 368.
as they are subsumed under ZF and denied the extrasituational possibility of the
‘genuine’ event.

In recent years, Badiou has been chastised for having denied Deleuze his
own mathematics in this sense, and has tried to attend to that which he so
casually elided in his earlier work. In an essay, “One, Multiple, Multiplicities,”
penned in response to some of the backlash\(^{92}\) against *The Clamor of Being*,
Badiou makes more explicit his opposition to Deleuze’s work on the grounds of
mathematics. He levies three critiques in particular at the Deleuzian camp:

1. The ‘sets’ that Deleuze addresses (primarily with Guattari in *A Thousand
Plateaus*) are, according to Badiou, insufficiently educated in “the
extraordinary immanent dialectic that this concept has undergone at the
hands of mathematics ever since the end of the nineteenth century.”\(^{93}\)
Here again emphasizing the work of Deleuze as irreducibly Bergsonist,
Badiou characterizes the ‘experiential’ construction of multiplicities as
anachronistic insofar as it does not account for the innovations of Georg
Cantor, Paul J. Cohen, and Kurt Gödel.
2. The ‘density’ of Deleuze’s concept of multiplicities is inferior in all cases
to the concept of the Multiple that Badiou is able to extract from
contemporary set theory.
3. Deleuze’s purported failure to account for the innovations of
contemporary mathematics—of which, Badiou suggests, his

\(^{92}\) In particular, Badiou seems most incensed by the articles published in *Futur Antérieur* 43,
including the text by Gil cited above.
\(^{93}\) Alain Badiou, “One, Multiple, Multiplicities,” in *Theoretical Writings*, trans. Ray Brassier and
Alberto Toscano (London: Continuum, 2005), 70.
“‘impoverished’ interpretation of Riemann”⁹⁴ is a symptom—renders it impossible for him to think of a ‘multiple-without-oneness’. While Badiou is able to characterize the extent to which the Multiple is primordially distinct from the One, he posits that Deleuze’s model fails insofar as the primordial model is the One.

In each case, what is evident in even this more substantial reading of Deleuze’s mathematics is that Badiou sees in Deleuze a mathematical dilettantism, a fixation with the history of mathematics that falls short of Jean Dieudonné’s prescription that if one is to do philosophy of the sort taken up by Badiou and Deleuze alike, “one must master the active, modern mathematical corpus.”⁹⁵ Insofar as Badiou challenges Deleuze on the basis of his inability to muster the philosophical forces of contemporary mathematics, however, we must subject Badiou to the same criticism. Albert Lautman has shown, against the logicist tendency toward tautologism, that advanced mathematics consists in far more than what is trivialized from the perspective of ZF. Rather, as Fernando Zalamea schematizes, the thrust of Lautman’s thinking manifests itself in the proposition that “mathematics—beyond its ideal set-theoretical reconstruction—hierarchizes itself into real environments of dramatically varying complexity.”⁹⁶

What David Corfield has polemically called ‘real mathematics’, or the field of advanced knowledge within which practicing mathematicians work, remains inaccessible to Badiou in the sense that he is not truly an exception to Corfield’s

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⁹⁴ Ibid.
⁹⁵ Badiou, Being and Event, 12.
claim that “few philosophers of mathematics have been prompted to gain anything approaching the level of historical and theoretical knowledge that philosophers of natural science are expected to have.”

His reductions of Deleuze’s figures to that which can be captured in the set theory bespeak an unfamiliarity with the differential levels of relative complexity that dissolve when regarded from the vantage point of ZF. From the perspective of ZF, as Zalamea explains, both the elementary proposition ‘2+2=4’ and the extraordinarily complicated separable Hahn-Banach theorem are seen as equivalent insofar as we can deduce both from the axioms of ZF. Yet, from the perspective of the “reverse mathematics” of intermediate deductive systems, we find that the basic propositions of mathematics are deducible at the lowest levels of mathematical complexity, while the Hahn-Banach theorem, as Zalamea argues, “not only requires more advanced instruments” but is

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97 David Corfield, Towards a Philosophy of Real Mathematics (Cambridge: Cambridge UP, 2003), 16.

98 The separable Hahn-Banach theorem: Let the field $K$ be either $\mathbb{R}$ or $\mathbb{C}$ and let $Z$ be a locally convex $K$-vector space. Then, if $X, Y \subset Z$ are convex, with $X$ compact, $Y$ closed, and $X \cap Y = \emptyset$, then there exists a linear map $\phi: Z \to K$ and $\alpha, \beta \in \mathbb{R}$ such that $Re\phi(x) \leq \alpha < \beta \leq Re\phi(y)$ for all $x \in X$ and $y \in Y$. In short: a bounded linear form on a subspace of a separable Banach space extends to a bounded linear form on the entire space.


100 That is, in the system RCA$_0$, which posits only the existence of recursive (i.e., computable) sets and which therefore demonstrates, insofar as many classical theorems are provable in RCA$_0$, the minimal level of logical strength needed in most cases.

101 That is, the system WKL$_0$, which consists of RCA$_0$ plus a weak form of König’s lemma (i.e., that every infinite binary tree has an infinite path). It is worth noting that, while seeming to be two discrete and sequential steps of complexity, work has been done on intermediate deductive systems between WKL$_0$ and RCA$_0$ (Cf. Carl Mummert, “Subsystems of Second-Order Arithmetic between RCA$_0$ and WKL$_0$” Archive for Mathematical Logic 47, no. 3 (June 7, 2008): 205–210 and especially Stephen G. Simpson, “[Π$^1_1$] Sets and Models of WKL$_0$” in Reverse Mathematics 2001, ed. Stephen G. Simpson, Lecture Notes in Logic 21 (La Jolla, Calif.: Association for Symbolic Logic, 2005), 352–378.)
fully *equivalent* to those instruments.”102 The choice of an excessively powerful logical background upon which one is to work out propositions of varying complexity does nothing except obscure an entire world of relative differentiations among propositions. As Corfield argues, “Mathematics has been and remains a superb resource for philosophers. Let’s not waste it.”103 The way in which mathematics stands as a resource for philosophy, as will be explored more seriously in chapter four, is not limited to the particular claims that one can prove, for instance, in ZF. Rather, it is also in context with the larger ontological outcomes that result from effective mathematical practice—*e.g.*, the ways in which Simpson’s powerful hierarchicalization of mathematics on the level of proof-theoretic complexity impacts our understanding of formal systems—that one begins to appreciate how mathematical theory and philosophy can stand in a mutually informative and non-reductive relationship. Badiou’s inattention to the vast majority of mathematical practice allows him to violently construe oftentimes-irreducible concepts as nothing more than subspecies of one particular set theory which in turn results in his failure to integrate mathematical insights across the disciplines into his ontology.

This refusal or inability to think exogenous mathematical and philosophical concepts alongside his own in a democratic manner is symptomatic of the fact that the ontological stakes of Deleuze’s engagement with mathematics are never *fully* established under Badiou’s mathematicism. As a

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103 Corfield, *Towards a Philosophy of Real Mathematics*, 270.
consequence, the extent to which Deleuze’s mobilization of mathematics moves, in some respects, toward complicating the Badiouan image of mathematics is obscured. Insofar as Badiou refuses *tout court* to engage substantially with Deleuze’s mathematics *qua* the overarching vision of mathematical descents, ascents, and problematics that he inherits from Lautman, the Deleuze of *The Clamor of Being* and of “One, Multiple, Multiplicities” remains but a thin foil for Badiou’s project, a fundamentally problematic vitalist without the expertise to properly make use of mathematical concepts. The conflict to be worked out in presenting a fuller picture of Deleuze’s engagement with mathematics is double. First, to establish Deleuze as a mathematical thinker beyond and despite Badiou’s cries of ‘Bergsonism!’ This is also to substantially complicate the distinction that Badiou establishes between his work on multiplicities and the Deleuzian paradigm. Second, to establish an alternative, dynamic mode of thinking mathematical practice and ontology in Deleuze’s Lautmanian readings of group theory, calculus, and differential geometry is to offer one possible alternative to Badiou’s breakneck reduction toward tautology. The interpretation to be offered is one that places Deleuze’s Bergson under the sign of Lautmanism, and, as a matter of course, Heideggerianism, in the hopes of exhibiting what is radically new in Deleuze’s work. In short, what seems to be the best interpretive remedy to Badiou’s reduction of Deleuze to the vitalist side of the animal/number disjunction is to insist upon Lautman and Heidegger, not Bergson, as the central theoretical touchstones for Deleuze’s work.
3. Deleuze *contra* Badiou

In Deleuze’s work, the sense that the repetition of philosophical concepts within several *non-foundational* mathematical contexts consists in far more than the attempt to cash in on the cultural capital that the formal sciences have accrued is of serious value. To this end, *Difference and Repetition* may be read as effectively giving body to two series of repetitions. The conceptual-mathematical thought of chapters four and five repeat the philosophical thought of chapters one and two, respectively. In the midst of these repetitions, chapter three serves, following Crockett, as "the center of the book," around which these two series revolve.¹ However, chapters four and five are not merely technical *recapitulations* of the philosophical content of chapters one and two. As Deleuze writes, invoking Hume’s famous thesis, “Repetition changes nothing in the object repeated, but does change something in the mind which contemplates it.”² Something new is drawn from repetition; the mathematical contexts in which the substantial philosophical insights of the first two chapters are not merely put into place, as

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¹ Crockett, *Deleuze beyond Badiou*, 30.
² Deleuze, *Difference and Repetition*, 70.
Sokal and Bricmont would have it, “to impress the reader,” but rather, as in Simon Duffy’s schematization, “[to extract] mathematical problematics or series of problems from the history of mathematics that have led to the development of alternative lineages in the history of mathematics, in order to use them to reconfigure particular philosophical problems, and to construct new concepts in response to them.” Far from mathematical dilettantism, Deleuze’s use of mathematics is focused, ably wielded, and historically informed—all on the backdrop of a complicated, synthetic foundation for mathematical inquiry.

In order to fully appreciate the extent to which mathematical thought is essential to Deleuze’s project here, two facets of his work must be elucidated. First, the theoretical framework of problematics and axiomatics that is so closely tied up with his thinking of the history of mathematics; and second, the Heideggerian-Lautmanian inheritance of this particular mode of thinking mathematics.

**Problems, Axiomatics, and Difference**

In Daniel W. Smith’s estimation, there exist two essential polarities between the ontologies of Deleuze and Badiou. First, as Smith argues and as we have intimated above, “[For] Deleuze, the ontology of mathematics is *not* reducible to axiomatics, but must be understood much more broadly in terms of the complex

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between axiomatics and what he calls ‘problematics’.” Axiomatics, like the ZF set theory used by Badiou, are for Deleuze instantiations of a ‘royal’ model of science that is “inseparable from a ‘hylomorphic’ model implying both a form that organizes matter and a matter prepared from the form; it has often been shown that this schema derives less from technology or life than from a society divided into governors and governed, and later, intellectuals and manual laborers.” For Deleuze, a complementary mode of inquiry resides in the concept of the ‘nomad’ science—the science not of axiomatics but of problematics—which takes as its model “one of becoming and heterogeneity, as opposed to the stable, the eternal, the identical, the constant” and which therefore takes as its object of study a matter that “is never prepared and therefore homogenized matter, but is essentially laden with singularities.” Andrew Pickering suggests that this is a dual yet disjoint set of processes. On the one hand, we have two phases of doing science in the sense of finished theories (axiomatics) and ongoing research (problematics). On the other hand, however, we also have two kinds of doing science, the ‘royal’—that is to say, axiomatic—form being “classically modern sciences like physics and sociology, which have, indeed, been enfolded in projects of state formation and governance since their inception” This is fundamentally a misrepresentation of what is at stake in Deleuze’s model.

7 Ibid., 361.
8 Ibid., 369.
of the sciences and a capitulation, if hidden and complicated, to Badiou's
apotheosis of the axiomatic throughout his work and, more specifically, his
misreading of Deleuze's mathematics.

This much is evident in considering the second polarity that Smith
identifies, which resides at the heart of the debate over multiplicities with which
we have been grappling. For the very reason that there exist in Deleuze these
two modes of doing science, there exists also two modes of thinking
multiplicities. As Smith writes, “[The] concept of multiplicity, even within
mathematics itself, cannot simply be identified with the concept of a set; rather,
mathematics is marked by a tension between extensive multiplicities or sets (the
axiomatic pole) and virtual or differential multiplicities (the problematic pole),
and the incessant translation of the latter into the former.”¹⁰ In a substantial
sense, the distinction between the nomadic and the royal is, as in the dice-throw
above, a formal distinction. As previously argued, neither the formal plurality of
the dice-throw nor the existence of these modes of inquiry bespeaks a
transcendent One that unifies the axiomatic and the problematic or all dice-
throws under the sign of the eventum tantum. Rather, as Deleuze writes with
Guattari, the play of these two modes of science takes place upon “a single field
of interaction in which royal science continually appropriates the contents of
vague or nomad science, while nomad science continually cuts the contents of
royal science loose.”¹¹ Neither axiomatics nor problematics can be thought of as
transcendent to one another, but, rather, must be thought in terms of their

¹¹ Deleuze and Guattari, A Thousand Plateaus, 367.
capacity to affect and be affected by one another in a given space that cannot be said to be proper to either the axiomatic nor the problematic mode of practicing mathematics. With this in mind, pace Pickering and Badiou, Deleuze is evidently not interested in denying the importance of axiomatics in scientific inquiry. For all of his Heideggerian inheritance, and while there is something to be said of a relation between the axiomatic, problematic pair and Heidegger’s observation of a difference between modern technology as an impoverished mode of relating to things qua instrumental ‘En-framing’ [Ge-stell] and the poïēsis of yore as a triumphantly Hölderlinian ‘bringing-forth’ [Her-vor-bringen], Deleuze cannot imagine (perhaps rightly) a science that would not be the constant play of deterritorialization into problematics and reterritorialization into axiomatics. This play is almost always a coupled pair in the sense that nomadic innovation is made axiomatic, which is made subject to the solvent of innovation again. As in the famous example wherein the orchid deterritorializes the wasp and the wasp reterritorializes itself upon that image, Deleuze and Guattari ask, “How could movements of deterritorialization and reterritorialization not be relative, always connected, caught up in one another?” If, as Heidegger observes, “There was a

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13 Cf. Hölderlin’s “Jetzt komme, feuer! / Begierig sind wir / Zu schauen den Tag” [Now come, fire! / Eager are we to see the day] in *Der Ister*.
14 The concepts of deterritorialization and reterritorialization are introduced by Deleuze and Guattari in *Anti-Oedipus* and, arguably, made clearer in *A Thousand Plateaus*. Deterritorialization refers to the process by which some object’s actual relations are severed; through this process, the object is made virtual again. When reterritorialized, new actual relations are established, and the object is made actual—usually in the model of some reterritorializing force.
time when it was not technology alone that bore the name *technē*,¹⁶ we find in Deleuze a reading of this dynamic that does not long for some foregone *existenziell*, some time before the axiomatic or royal. In each instance, in every science, the cofunctioning of the axiomatic and the problematic is fundamental; they make a rhizome, which is never reducible to the One. Deleuze’s thinking of this dynamic is drawn most profoundly from his reading of the history of mathematics, which is—like all sciences—replete with these processes of royal appropriation and nomadic expansion. In thinking through chapter four of *Difference and Repetition*—*i.e.*, that which deals most profoundly with the relationship between the Deleuzian Idea and the synthesis of difference in itself—we will consider Deleuze’s thinking of a subterranean history in mathematics, the often maligned history of the problematic pole of mathematical inquiry.

The formal calculus taught each year to countless undergraduates differs substantially from the infinitesimal and fluxional calculi developed in the latter part of the seventeenth century. What is today an exercise in abstraction was initially a practice of intuition. As Carl Boyer notes, the development of the calculus is an example *par excellence* of a process common to the development of almost all fields of mathematics—that of “the emancipation from all sense data of ideas bourn of our primary intuitions.”¹⁷ Boyer goes on to observe that “the calculus, in the early stages of its development, was bound up with concepts of

geometry and motion, and with explanations of indivisibles and the infinitely small; and these ideas are suggested by naïve intuition and experience of continuity.”

Whether in the form of Leibniz’s infinitesimals (famously derided by Berkeley as ‘the ghosts of departed quantities’) or in Newton’s fluxions and fluents, dominant in these early years was a form of mathematical thinking that took as its starting point not a set of axioms but rather an ungrounded—at least in rigorous mathematical terms—intuition of continuity that was the condition of possibility for this novel thinking of tangent and quadrature.

While the calculi developed by Leibniz and Newton differed insofar as Leibniz insisted upon his ratios of infinitesimals and Newton his fluxions, what is clear is that their commonality lies in their problematic natures. But what precisely is a problematic and what role does it play in Deleuze’s thought in excess of that which is cast into relief by the dominant power of the axiomatic, that which is not submitted to the state logic of the axiomatic? A detour is necessary here into Deleuze’s Heidegger; otherwise, we risk making Deleuze into Latour, a profoundly original thinker of science in action, but not a philosopher in the sense demanded by Deleuze’s dictum that, under the condition of univocity, “philosophy merges with ontology.”

This is to say, Deleuze’s interest is in neither phenomenology nor some proto-Latourian network analysis except insofar as either is thinkable in purely ontological terms. This much is made evident through Deleuze’s interpretation of Heidegger. Though only a short passage in chapter two is dedicated to an explicit and sustained treatment of

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18 Ibid.
19 Deleuze, *The Logic of Sense*, 179.
Heidegger's work, Deleuze's nuanced understanding of the post-*Being and Time*

Heidegger's position on ontological difference is of profound importance insofar as he identifies the crucial question to be treated in *Difference and Repetition* not in Bergsonian but rather in Heideggerian terms. Here, he writes,

> In accordance with Heidegger's ontological intuition, difference must be in articulation and connection in itself; it must relate different to different without any mediation whatsoever by the identical, the similar, the analogous, or the opposed. There must be a differenciation of difference, an in-itself which is like a *differenciator*, a *Sich-unterscheidende* [self-differentiating], by virtue of which the different is gathered all at once rather than represented on condition of a prior resemblance, identity, analogy or opposition.²⁰

The fundamental task taken up by Deleuze throughout the text is that of how difference can relate to difference without being subsumed into a logic of identity. As Deleuze has shown, this particular subsumption refuses the thinking of difference as such insofar as “it is proposed to ‘save’ difference by representing it,” whereupon it is “‘mediated’ to the extent that it is subjected to the fourfold root of identity, opposition, analogy, and resemblance.”²¹ It is here that Heidegger becomes a crucial ally for Deleuze, though, as Badiou rightly notes, “[For] Deleuze, Heidegger is still and always too phenomenological.”²² A very particular Heidegger is invoked in *Difference and Repetition*, a Deleuzo-Heidegger that amounts to, as in Deleuze’s oft-quoted turn of phrase, “a child that would indeed be his but would nonetheless be monstrous.”²³ Though none of Heidegger’s philosophical offspring are perfect children, Deleuze’s

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²⁰ Deleuze, *Difference and Repetition*, 117.
²¹ Ibid., 29.
²³ Ctd. in Deleuze and Guattari, *A Thousand Plateaus*, x.
mobilization of Heidegger ends up a monstrosity in the sense that he is by no means a Heideggerian—rather, like Laruelle, Deleuze thinks of Heidegger as a repository of infinitely malleable materials that point toward the possibility of a novel mode of thought.

Deleuze begins with a quote from Heidegger’s “On the Essence of Ground,” which reads in context: “The nothing is the ‘not’ of beings, and is thus being, experienced from the perspective of beings. The ontological difference is the ‘not’ between beings and Being. Yet just as being, as the ‘not’ in relation to beings, is by no means a nothing in the sense of a nihil negativum, so to the difference, as the ‘not’ in between beings and being, is in no way the figment of a distinction made by our understanding (ens rationis).” For Deleuze, the most profound misreading of Heidegger’s post-Being and Time work resides in various interpretations of the concept of the ‘not’, which “refers not to negation but to questioning.” This ‘not’, for Heidegger, “does not originate through negation; rather, negation is grounded in the ‘not’ that springs from the nihilation of the nothing” which “does not merely serve as the counterconcept of beings; rather, it originally belongs to their essential unfolding as such.” This essential unfolding is the unfolding of the Zweifalt, the ambivalent two-fold of Being and beings that constitutes the ‘between’ of ontological difference; it is this ‘between-

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24 The title is alternatively given as “On the Essence of Reasons”; I have chosen to use the title used in Pathmarks (1998) for the sake of continuity with the rest of the selections that I use from the collection.
26 Deleuze, Difference and Repetition, 64.
28 Ibid., 91.
ness’, this fold between Being and beings, that Deleuze identifies as “constitutive of Being and of the manner in which Being constitutes being, in the double movement of ‘clearing’ and ‘veiling’. If Zweifalt is constitutive of Being—that is to say, if the Zweifalt is the concealed but preontological and nonoriginary condition of Being, the differentiating ‘between’ that constitutes an opening for Being—then Being is itself this Sich-unterscheidende ‘differenciator’ of difference in itself, a self-folding fold without ground. As Heidegger writes: “[That] which is never and nowhere a being unveils itself as that which self-differentiates [Sich-unterscheidende] from all beings, as that which we call Being.” Thus, in other words, this Zwiefalt is the between of a differential relation between two series of difference—on the one hand, Being, itself unveiled as this self-differentiator; and on the other, beings—which necessarily preserves their ontological difference since, as Heidegger writes, “Being itself can open out in its truth the difference of Being and beings preserved in itself only when the difference explicitly takes place.” It cannot happen that this difference be subsumed into a thinking of identity, for that would foreclose upon the taking-place of this difference—it must therefore be that the Zwiefalt consists in establishing this ‘between’ that refuses dualism or the negation of either of its terms in its insistence upon difference and instead associates the two in reference “not to negation but to questioning.”

29 Deleuze, Difference and Repetition, 65.
32 Deleuze, Difference and Repetition, 64.
Indeed, the differenciation—*i.e.*, the insinuation of a difference that relates two differences—that occurs *qua* this *Zweifalt* can only be made explicit, Heidegger holds, insofar as it stands in relation to a primordial question: "To make this ‘differentiation’ explicit is not at all to say something thoughtful, unless the explication totally springs from the question of the ‘meaning of beyng’ [which] must be asked as the question which is historically *decisive* for metaphysics."³³ For Deleuze, this is the essentially problematic valence of differenciation; as he writes, “Ontological Difference [...] is the being of questions, which become problems, marking out the determinant fields of existence.”³⁴ This, profoundly, is the crux of Deleuze’s reading in chapter 4 of Kant and his Ideas. As Deleuze notes, Kant conceives of the Idea in the *Critique of Pure Reason* as being essentially ‘problematic’. This is to say, the essential Ideas of reason presupposed by Kant (*i.e.*, God, freedom, and immortality) are “never of constitutive use”³⁵ and, moreover, are problems that “[admit] of no solution[s].”³⁶ Yet, insofar as these Ideas lead us to operate *as if* God, freedom, and immortality exist, Deleuze suggests a repetition of the critique of the Cartesian model of the subject that he found in Kant in his third synthesis of time. In Kant, problematic Ideas “are both objective and *undetermined*”³⁷ with respect to their objects in the sense that the object of an Idea is itself noumenal—we have no direct access to the notions of God, freedom, or

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³⁴ Deleuze, *Difference and Repetition*, 65.
immortality. They are, moreover, determinable with respect to objects given in experience in the sense that the undetermined object of the Idea confers systematic unity on the objects of apperception. Finally, problematic Ideas are fully determined with respect to the concepts of the understanding itself in that these concepts “find the ground of their (maximum) full experimental use only in the degree to which they are related to problematic Ideas.”38 With this Kantian triad of undetermined/determinable/determined in mind, Deleuze concludes that the fracture established in the I, the caesura discussed above that allows for the intervention of the new, is the locus of the Idea. He writes:

> It is apparent that Ideas here repeat the three aspects of the *Cogito*: the *I am* as an indeterminate existence, *time* as the form under which this existence is determinable and the *I think* as a determination [...]

Moreover, in so far as the *Cogito* refers to a fractured I, an I split from end to end by the form of time which runs through it, it must be said that *Ideas swarm in the fracture, constantly emerging on its edges, ceaselessly coming out and going back, being composed in a thousand different manners.*39

As these Ideas swarm through the caesural subject, their composition *qua* virtual multiplicities, loci of difference in itself, takes form. Their differentiation is not pre-given as a coherent virtual totality; rather, this differentiation produces a multiplicity, a range of Ideas as fractured as the subject through which they course, a world of Ideas that “contain their dismembered moments,”40 viz., some range of the indeterminate/determinable/determined triad. In the final analysis, the Idea is to be taken as the “*internal* problematic objective unity of the

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38 Ibid.
39 Ibid. Emphasis mine.
40 Ibid., 170.
undetermined, the determinable, and determination.”

Herein lies the shortcoming of the Kantian attitude, Deleuze argues. In Kant, it is only ever the undetermined moment that is internal to the Idea; they become determinable only insofar as they relate to some external object in experience and are determined only with respect to some concept of the understanding. Moreover, as Deleuze posits, from a Kantian perspective each of these moments is given body in distinct Ideas. The self is an undetermined idea, the world is determinable, and God stands alone as the determined. If we are to think the problematic as “the horizon or focal point at which difference qua difference serves to reunite,” we cannot be Kantians. We need a new mode of thinking the problematic—and this is where “treasure buried within the old so-called barbaric or pre-scientific differential calculus” comes into play.

This pre-axiomatic calculus was tied to problematics in a dual sense. First, as Smith notes, it was problematic twice over in its very development insofar as it was fundamentally predicated upon “recognizing the intimate connection between [the] two problematics” of tangents (i.e., the fundamental problem of the differential calculus—finding the tangent values of a given curve) and of quadrature (i.e., the fundamental problem of the integral calculus—finding the area enclosed within a given curve). In short, the problem was finding tangents and quadrature; these problems, plus the intuitive thinking of continuity that provided the conditions for their possibility amounted to two series of

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41 Ibid.  
42 Ibid.  
43 Ibid.  
problematic difference that were related *qua* their difference by what would come to be known as the fundamental theorem of calculus. However, more fundamentally for Deleuze, the very language of the *differential* calculus provides a mode of thinking difference in itself, a language wherein “there is a differential calculus corresponding to each [problematic] Idea, an alphabet of what it means to think.”45 The essential quality of this mode of thinking is a capacity to intuit a notion of continuity that is fundamentally problematic in the sense that it provided the means toward “a genesis of truth, a production of the true in thought.”46 The problematic, then, is the questioning at the heart of the *Zweifalt*, the eruption of “communication between heterogeneous series,” and the advent of a ‘dark precursor’ according to which “events explode, phenomena flash, like thunder and lightning.”47

*More mathematically*, for Deleuze, the symbol of difference in itself is the Leibnizian notation for an infinitesimal change in the value of some function, $dx$, which, under his reading, “appears as simultaneously undetermined, determinable, and determination.”48 That is to say, we have three ‘principles’ of the sign for an exceptionally small difference, $dx$, that correspond to each of the three aforementioned Kantian moments. First, “a principle of determinability corresponds to the undetermined as such ($dx, dy$),” which indicates the possibility of determining these two disparate series in a differential relation.

Because we only obtain a derivative as the ratio of differentials, the existence but

45 Deleuze, *Difference and Repetition*, 181.
46 Ibid., 162.
47 Ibid., 118.
48 Ibid., 171.
non-relation of these two differentials suggests the possibility of their
determination *qua* derivative. Second, “a principle of reciprocal determination
corresponds to the really determinable \((dy/dx)\),” which is to indicate the mutual
imbrication of these two series of difference as *Zweifalt*. We have obtained the
form for the derivative of \(y\), which only comes to be in the ratio—*i.e.*,
difference—of two differentials. Finally, “a principle of complete determination
corresponds to the effectively determined (values of \(dy/dx\))^49 such that we have,
for some function, the differential values for all \(y\) along the curve. In that each is
build up from the primitive differential \(dx\), no one of these principles is external
to the Idea insofar as they are all contained within the effective problematic that
corresponds to it. Together, these principles constitute “the reciprocal synthesis
of differential relations as the source of the *production* of real objects.”^50 This
virtual synthesis is the opening up of the world for the eventual emergence of
phenomena in the actual.

As in the case of almost all problematics, the preaxiomatic calculus would
be axiomatized and its founding intuition of continuity—that which permitted it
to be thought of as an Idea in this Deleuzian sense—would be eliminated. Felix
Klein considered this purging of intuition to be akin to the “the establishment, as
it were, of law and order after the long and victorious campaign”^51 fought out by
Newton, Leibniz, and others in the seventeenth century. As he notes, “With the
contemplation of nature as starting point, and its interpretation as object, a

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philosophical principle, the principle of continuity, was made fundamental; and the use of this principle characterizes the work of the great pioneers, Newton and Leibniz, and the mathematicians of the whole of the eighteenth century—a century of discoveries in the evolution of mathematics."\(^5^2\) But the outcome of these battles, the institution of what was seen as mere intuition at the heart of mathematical thought, would not be enough. As Klein goes on to note, here, “a more critical spirit asserted itself and demanded a logical justification for the innovations made with such assurance.”\(^5^3\) This push toward logical justification, baptized by Klein as the ‘arithmetization of analysis’, would be the discretization of what was continuous under the intuitions of Leibniz, Newton, \textit{et al.} As Smith notes, the project of discretization finally consummated by Weierstrass had as its task the separation of “the calculus from the geometry of continuity [in order to] base it on the concept of number alone. Geometrical notions were thus reconceptualized in terms of sets of discrete points, which in turn were conceptualized in terms of number.”\(^5^4\) Instead of a geometric intuition of, for instance, the limit as a point moving continuously toward some bounded space, Weierstrass conceived of this limit rather as the infinite series of discrete steps that some arbitrary number would take toward some other number. The fundamental assumption, of course, was that only number could be counted as rigorous; geometry, except insofar as it is thought of as an extension of the thinking of number, could not. Herein lies the seeds of Badiou’s position. The

\(^{52}\) Ibid.
\(^{53}\) Ibid.
\(^{54}\) Smith, “Mathematics and the Theory of Multiplicities,” 419.
problematic pole of mathematics is simply lying in wait for axiomatization; and insofar as ZF provides us with the ideal means to axiomatize nearly everything, with ZF we shall proceed.

Deleuze’s Lautman

Deleuze was not blind to the fact that his thinking of the problematic relies upon a mode of practicing mathematics that was left behind in the resolute march toward modern mathematics. As he notes, “The real frontier defining modern mathematics lies not in the calculus but in other discoveries such as set theory.” Nevertheless, Deleuze holds, the fact that axiomatics are dominant in modern mathematics does not mean that the tension between problematics and axiomatics has too dissolved. Even in contemporary mathematics, Deleuze suggests, the “strict finite interpretation that it gives of the calculus nevertheless presupposes an axiom of infinity in the set theoretical foundation, even though this axiom finds no illustration in the [modern] calculus. What is still missing is the extra-propositional and sub-representational element expressed in the Idea by the differential, precisely in the form of the problem.” This is blindingly clear when considering Badiou’s commentary on A la nue accablante tu outlined in chapter one—and, indeed, his ontology of the event more broadly. While the event is intrinsic to the problematic in Deleuze, Being prohibits the event in Badiou’s axiomatic. Insofar as Badiou has defined his event as a “one-multiple made up of, on the one hand, all the multiples which belong to its site, and on the

55 Deleuze, Difference and Repetition, 176.
56 Ibid., 178.
other hand, the event itself,” or, more formally, $e_x = \{x \in X, e_x\}$, this event-set is to be comprehended as what the logician Mirimanoff would call an ‘extraordinary set’ or what we today call a ‘hyperset’. To follow Mirimanoff’s formalization, given a set $E$ with $E'$ one of its elements, $E''$ an element of $E'$, and so on, there exists a descent (i.e., a sequence of steps from $E$ to $E'$, $E'$ to $E''$, etc., that we write in terms of a $\in$-sequence $\cdots \in E'' \in E' \in E$). A set is extraordinary, if, given such a descent, we have “an infinite sequence of sets, consisting of an element of the set, an element of that element, an element of that element of that element and so on ad infinitum.” In the universe of extraordinary sets, it is, as in the old anecdote, ‘turtles all the way down’; we have an alternative world of sets, based on ZF but also with its own ontology of infinite descent which enables it to be fundamentally larger than the von Neumann universe $V$ that ZF takes as its universe of discourse. Yet, because Badiou has already committed himself to ZF, he has also committed himself to the axiom of foundation, which dictates that, for every set $X$ that is not the empty set, there must exist some $y$ in $X$ such that the intersection of $y$ and $X$ is null. The implication, then, is that an extraordinary set cannot exist—and, therefore, that the event is necessarily excluded, just as in Badiou’s reading of the Mallarméan event as only ever consisting in the trace of an event which has always already been excluded from the narrative. Metamathematics imitates mathematics for Badiou in the sense

57 Badiou, Being and Event, 179.
58 Peter Aczel, Non-Well-Founded Sets, CSLI Lecture Notes, no. 14 (Stanford, CA: Center for the Study of Language and Information, 1988), xvii.
59 Indeed, given the four most prominent anti-foundation axioms AFA, SAFA, FAFA, and BAFA, each gives an increasingly larger universe: $V \subseteq U_{AFA} \subseteq U_{SAFA} \subseteq U_{FAFA} \subseteq U_{BAFA}$.  
60 I.e., $\forall X (X \neq \emptyset \rightarrow \exists y \in X (y \cap X = \emptyset))$
that those aspects of the preaxiomatic mathematics that cannot be subsumed under ZF are considered inadequately rigorous and are therefore already excluded by the impersonal machinery of the set theory. Because Badiou presupposes a criterion of rigor for that which can be formalized, he discounts a priori that which seems to be too difficult to make rigorous—including, of course, the event.

Yet, as set theorist Kenneth Kunen has shown, “unlike the other axioms of ZFC [i.e., ZF with the axiom of choice], [the axiom of] Foundation has no application in ordinary mathematics.”  

Because hypersets do not occur, for instance, in the construction of the real or complex numbers, it is generally unproblematic to assert this axiom as fundamental to the ontological background upon which mathematics is practiced. However, if we shift our attention to the leading edge of Corfield’s ‘real mathematics’, what becomes clear is that the sets prohibited in ZF are not likewise excluded from mathematical practice writ large. Indeed, as Bernays showed in 1954, “If we can satisfy the [axioms of ZF apart from that of foundation], we can satisfy them in a way that there exists an infinite set, each element of which is its own only element,”  

establishing with the existence of ‘non-well-founded’ models of the classical set theory the independence of the rest of ZF from this axiom of foundation. In the years since, as Peter Aczel observes, there have been quite a few articles and monographs penned that make use of these extraordinary sets; indeed, since

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1960, no fewer than four alternative models of ZF have been proven consistent and subsequently exploited in the practice of mathematics outside of set theory.\textsuperscript{63} It is not just that, as Badiou would (derisively) have it, the axiom of foundation “is surplus to the working mathematician’s requirements,”\textsuperscript{64} but rather that, in many cases, it is simply irrelevant. The dynamism of mathematical research subverts the prescriptions and proscriptions of \textit{a priori} axiomatics on a near constant basis. To equate a particular model of set theory with ontology and therefore to fix one’s ontology in advance, as Zalamea points out, is “of dubious worth”\textsuperscript{65} given the incessant transits of mathematical thought.

The solution to this static conception of mathematics as having already been absolutely axiomatized, Deleuze posits, resides in the work of Albert Lautman, who, for Deleuze, offers a means of thinking mathematics \textit{qua} its still-problematic nature, even after the apotheosis of that famous “\textit{Weierstrass’sche Strenge}.”\textsuperscript{66} Herein, then, lies the possibility for what Deleuze terms a “general theory of problems.”\textsuperscript{67} As mentioned, Deleuze is not interested in denying the role of the axiomatic in mathematics; he understands the extent to which axiomatization is crucial in the development of a science insofar as it is the axiomatized ‘function’, produced out of the problematic ‘concept’, “which enables the sciences to reflect and communicate.”\textsuperscript{68} Yet, Deleuze holds, the problematic pole of mathematics has not \textit{disappeared}—and no thinker better

\textsuperscript{63}Aczel, \textit{Non-Well-Founded Sets}, 103ff.
\textsuperscript{64}Badiou, \textit{Being and Event}, 187.
\textsuperscript{65}Zalamea, \textit{Synthetic Philosophy of Contemporary Mathematics}, 12.
\textsuperscript{67}Deleuze, \textit{Difference and Repetition}, 164.
\textsuperscript{68}Deleuze and Guattari, \textit{What Is Philosophy?}, 117.
characterizes this than Lautman. Writing of the Vienna Circle logicists, though
this could equally apply to Badiou’s work, Lautman argues, “By trying to
construct all mathematical notions from a small number of concepts and from
logical primitives, we lose sight of the qualitative and integral character of the
constituted theories.” Lautman, however, should not be read as psychologizing
mathematics in the manner of Brunschvicg. While Brunschvicg also “rose up
against the reduction of mathematics to logic,” his was a thinking of
mathematics in which any a priori deduction tends “to reverse the natural order
of the mind in mathematical discovery.” Lautman’s project fits between
logicism and psychologism by attempting to characterize mathematical reality
“intrinsically, in terms of its own structure,” in a manner that is, as Duffy notes,
“both axiomatic-structural and dynamic, where the fixity or temporal
independence of the logical concepts and the dynamism of the temporal
development of mathematical theories are combined.” This is accomplished
through a thinking of a non-Hegelian dialectic between the mind of the
mathematician and the Ideas—in a unique form of mathematical Platonism—of
a mathematical reality that are “the structural schemata according to which
effective theories are organized.”

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72 *Ibid.*, 88. This, of course, has strong affinities with Cavaillès’ critique of Husserl, briefly mentioned in chapter one.
73 Duffy, *Deleuze and the History of Mathematics*, 120.
For Lautman, the Idea should not be thought of in any sense amounting to an ontology of Forms to which corresponds a world of degraded mathematical simulacra. Given a series of pairs of Lautmanian notions—e.g., whole/part, situational/intrinsic, global/local, etc.—the Ideas “envisage possible relations between dialectical notions.” Moreover, the dialectical Ideas, thus characterized, constitute a problematic in the sense that, for instance, “the existence of mathematical relations [...] necessarily refers back to the positive Idea of the search for similar relations in general.” While mathematical (i.e., axiomatized) relations describe ontic connections between actually existing mathematical entities, Lautman holds that “the Ideas of dialectical relations are not assertive of any connection whatsoever that in fact exists between notions. Insofar as ‘posed questions’, they only constitute a problematic relative to the possible situations of entities.” Deleuze’s inheritance from Lautman is evident. It is through his reading of this particular conception of the dialectical problematic that Deleuze is able to profoundly shape his own ‘calculus of problems’ in a way exceeding that which he obtained from the preaxiomatic differential calculus. While the Deleuzian Idea is certainly opposed to Lautman’s renewal of Platonism, held in common is a heterodox Heideggerianism. As in Heidegger, “the originary ontological concepts must be attained prior to any scientific definition of fundamental concepts.” For Deleuze, then, “Problems are always dialectical: the dialectic has no other sense, nor do problems have any other

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75 Ibid., 204.
76 Ibid.
77 Ibid. Emphasis mine.
sense. What is mathematical (or physical, biological, psychical, or sociological) are the solutions."\textsuperscript{79} There is a radical, ontological alterity between the dialectical problematic and the scientific solution, or, in other words, a transcendence of the ontological over the ontic in the sense that the relationship between the problematic concept and its corresponding solutions is one of unidirectional dependency. As Heidegger writes, a scientific fact "can only be one possible occasion for pointing us toward the originary ontological constitution of, for example, history or nature."\textsuperscript{80} The ontic world of individual existents with which science is concerned is but a suggestion of the unconcealment of Being itself. With their common Heideggerian background in mind, Deleuze suggests that we may refine our notion of the problem, which is typified in Lautman by three qualities: "its difference in kind from solutions; its transcendence in relation to the solutions that it engenders on the basis of its own determinate conditions; and its immanence in the solutions which cover it."\textsuperscript{81} The ‘field of solvability’ defined by the problems is thus little else than the \textit{Zweifalt} in the sense that it is the ‘between’ established in the fold of the dialectical and the scientific. In short, the problematic proceeds only insofar as (pre)ontological difference is given. Laruelle argues that Deleuze is closely affiliated with Derrida in this respect insofar as both "claim to work within [the ‘mixture’ of ontological difference], contenting themselves with loosening and retying otherwise the

\textsuperscript{79} Deleuze, \textit{Difference and Repetition}, 179.
\textsuperscript{80} Heidegger, "On the Essence of Ground," 105.
\textsuperscript{81} Deleuze, \textit{Difference and Repetition}, 179.
knots of thought.”\textsuperscript{82} Thus, \textit{Differenzphilosophie} is made to rely on an originary
Difference, which is obscured but is no less transcendent and which amounts to
an onto-theology, where the God of metaphysics has been replaced with
preontological difference. Where Badiou replaced God with the inexistence of
the void, Deleuze, in his Heideggerian Lautmanism, replaces God with a
preontological ambiguity linked substantially to the event. Even in that the
solutions are immanent to the field thus defined, Deleuze has committed himself
to a line of difference that, while more dynamic than Badiou’s reduction, and
while still burdened by Deleuze’s ‘on condition’, still presupposes \textit{a priori} a
radical differentiation. “It is in their full maturity,” he writes with Guattari, “and
not in the process of their constitution, that concepts and functions necessarily
intersect.”\textsuperscript{83} Yet, for the very concept of intersection to be meaningful, it must be
that the intersecting fields are always, even on condition of their maturity,
distinct.

Indeed, the \textit{Zweifalt} is always a fold of the two, a binary (k)not: the ontic
and the ontological, this or that series of difference—even if the ‘not’ is a
questioning, even if the ‘not’ is the moiré pattern of two series of difference. In
precisely this same way, there is only ever the problematic and the axiomatic,
the external and the internal, the differential and the extensive multiplicity, the
concept and the function. Though their interactions might generate interesting
and novel reticulations, the interactants are always dual and this suggests the

\textsuperscript{82} François Laruelle, \textit{Anti-Badiou: On the Introduction of Maoism into Philosophy}, trans. Robin
Mackay (London: Bloomsbury, 2013), 111.
\textsuperscript{83} Deleuze and Guattari, \textit{What Is Philosophy?}, 161.
inability of a third to truly intervene on this abstract level. If, given a series of dialectical problems, “their mathematical expression and the simultaneous origin of their fields of solvability are interrelated,”\textsuperscript{85} it is also true that “the two lines are therefore inseparable but independent, each complete in itself.”\textsuperscript{86}

Whereas we find in Badiou’s foundational thesis \textit{mathematics=ontology} the decisional gesture that inaugurates “an identity with science which (by way of a meta-ontology) separates ontology from the rest of philosophy,”\textsuperscript{87} the decisional invariant in Deleuze is no less than a relationship to mathematics—just as in his relationship to Badiou—that combines intimate proximity and irreducible distance. There is no third repetition here, no intervention of the pure and empty form of time at this preontological level. The highest form of mathematico-philosophical comingling is that of intersection, not integration. If his Lautmanism allows him to elude the reduction of mathematics to tautology, it also requires him to make a radical differentiation between Brunschvicg and Bergson, the formal and the poetico-philosophical. As Deleuze writes with Guattari, “It is, therefore, through two linked characteristics that philosophical concept and scientific function are distinguished: inseparable variations and independent variables; events on a plane of immanence and states of affairs in a system of reference.”\textsuperscript{88}

On the level of the structure of \textit{Difference and Repetition}, we find this same diremption at play in the methodological differences between Deleuze’s thinking on the synthesis of difference \textit{qua} multiplicities and the

\textsuperscript{85} Deleuze, \textit{Difference and Repetition}, 181.
\textsuperscript{86} Deleuze and Guattari, \textit{What Is Philosophy?}, 161.
\textsuperscript{87} Laruelle, \textit{Anti-Badiou}, 10.
\textsuperscript{88} Deleuze and Guattari, \textit{What Is Philosophy?}, 127.
individuation of actual entities. While Deleuze needed mathematics to characterize his vision of structural multiplicity, he needed experimental physics and biology to characterize his vision of the synthesis of the sensible. There is no continuity between these fields because, insofar as philosophy unilaterally mobilizes the tools necessary for the task, these tools can never be wholly immanent to philosophy. If Deleuze builds his philosophy around the sciences, it is certain that he maintains, if conceptually, the frontier between the tools and the loci of their application.

If univocity requires that Being be said in a singular and same voice in all instances, even if we are to read the difference between the axiomatic and problematic as purely formal, Deleuze’s Heideggerianism poses an issue that cannot be eluded. Even construed as a fold or a foundational ambiguity inaugurated in advance of Being, ontological difference qua transcendental difference seeps its way through Deleuze’s thought. Philosophy still undergoes a diremption: “the mutual exteriority of nature and freedom […] remains the axis around which philosophy is organized”⁸⁹ in the sense that, while both problematics and axiomatics are immanent to their mutual field of interaction, philosophy seems only to be proper to the former. Insofar as philosophy is a priori possible, this separation is always already given—and the capacity for philosophy, moreover, to interact with mathematics in creative ways is

foreclosed upon insofar as, for Deleuze and Guattari, “philosophy can speak of science”—including formal science—“only by allusion.”

Animal and Number

What becomes clear in this analysis is that neither Deleuze nor Badiou have been able to think mathematics as truly immanent to philosophy. The ineluctable consequence is that the opposition of Bergson and Brunschvicg, animal and number is never truly dissolved. The dice-throw, whether qua subtraction or qua differential becoming, is either split into two, as if it were Geist—problematic and axiomatic, external and internal, differential and extensive—or radically excluded from ontology tout court. If we are induced to choose between Deleuze or Badiou, we are faced with the decision of either incorporating life, mathematics, and the event in the case of Deleuze—but only insofar as they can contingently intersect; or of denying life, excluding the event, and giving ontology over to mathematics in the case of Badiou—a formalist ascesis in the style of a Nietzschean priest.

There is, nevertheless, a lesson to be learned from Deleuze on the level of method. In the preface to the English edition of *Difference and Repetition*, Deleuze accounts for the difference between writing the history of philosophy and writing philosophy: he writes, “In the one case, we study the arrows or the tools of a great thinker, the trophies and the prey, the continents discovered. In the other case, we trim our own arrows, or gather those which seem to us the

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finest in order to try to send them in other directions.”

Let us proceed to trim, then, for neither Deleuze nor Badiou is satisfactory on the question of *Un coup de dés*.

What remains clear is that their relationships to this animal/number distinction, while they are different, are inadequate for a thinking of Mallarmé’s dice-throw. The space of the shipwreck, the dice-throw, the constellation: this is a universe unto itself, immanent in itself, adequate unto itself. It demands no transcendence except, “as far as place can fuse with the beyond,” the relative transcendence of the septentrion. But, from the view of the *maître*, if the dice were in fact cast, if the number were obtained, this would not be transcendent. This would be a limit imposed on transcendence or on the infinite “from nullified regions” immanent to “this conflagration at his feet.” For the *maître*, there is no radical disjunction between his own animal life and the pure formalism of the dice-throw and of the number; it is indeed through his own animal life that the pure dice-throw occurs, and through the sinking of the ship that the number arises. In radical continuity with the number, the animal *infers, delays, chooses*—and in each case, something will have already “induced the old man toward this supreme conjunction with probability.”

The matheme and the vital animal interpenetrate, and neither is excluded; the proposition that “the field of human action must remain the sole locus of autonomy, possessing no substrate but the

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91 Deleuze, *Difference and Repetition*, xv.
92 Mallarmé, “Coup de Dés,” 144. “...aussi loin qu’un endroit fusionne avec au delà” (145).
94 *Ibid.*, 130. “...de cette conflagration à ses pieds...” (131).
95 *Ibid.*, 132. “...ayant [...] induit le vieillard vers cette conjonction suprême avec la probabilité...” (133).
“ethico-practical” is negated insofar as not only is the field of human action not comprehensible as such once we have subtracted the matheme, but also insofar as neither is comprehensible as the substrate of the other. The life of the maître is in the hands of a supreme mathematics, but the possibility of the intervention of number is also in the hands of the maître. He must cast the dice but the stellar matheme also casts itself through his animal life. Mutually dependent, not only is the maître qua cosmic animal shot through with the stellar matheme, but this stellar matheme is also shot through with the vital vicissitudes of the maître, with the contingency of the shipwreck, with the foamic flows of the whirlpool.

There is no extricating the one from the other; there is no line of difference to follow, no insinuation that the maître is of the world and the dice-throw is of the stars—for in each case, it is the maître that reaches into the stars and the stars that reach into the maître. If the dice-throw, as moment of stellarity, were to be excluded as in Badiou, the maître would be lost: the possibility of the “…aussi loin qu’un endroit…” would be a non-possibility. This would result in the foreclosure of precisely that which Mallarmé contingently insists upon in the sea of conditionals that is Un coup de dés. Insofar as this dice-throw could, perhaps, be the maneuver that suspends the sinking of the ship, that saves the maître's life, how could it be that Being stands outside of the ontic particularities of the naufrage-universe? The ontic dice-throw allows—again, perhaps—for a window onto the absolute, for a modulation of the absolute. Nothing can be allowed to intervene that insinuates such a distinction between the ontic and the

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96 Grant, Philosophies of Nature after Schelling, 17.
ontological, just as nothing can be allowed to intervene that would insinuate a distinction between the maître and the mathematical absolute that is given body in this instance in the dice-throw.

The task at hand is to contemplate a Mallarméan relationship to mathematics, a philo-poetics of mathematics that eludes Laruelle’s indictment of the canonical science-philosophy relationship as one that “essentially re-acts to the sciences without acting, properly speaking, upon them.”97 If the (suspended) dice-throw is an event that takes place within a space characterized by the radical mixture of stellar mathematicism and vital animality, to exclude it from our ontologies or to render it as a tool to be used in the development of our ontologies is to instrumentalize the event and to negate the heterogeneous space in which it takes place. If, as Deleuze and Guattari argue, “There is no such thing as either man or nature now, only a process that produces the one within the other and couples the machines together,”98 what seems key here is to argue that, instead, there is no such thing as either poetry of mathematics now, only a process that produces the one within the other and couples the machines together—and that this production is local, specific to Un coup de dés, an endogenous code that gathers together the vital and the stellar, which did not preexist the gathering, au fond d’un naufrage. The shipwreck qua ‘field of solvability’ is dedicated neither to the philosopher nor the mathematician; the dice-throw and this universe more broadly demands a thinking of the coupled

97 Laruelle, Anti-Badiou, ix.
98 Deleuze and Guattari, Anti-Oedipus, 2.
4. Anomalous Places and Fragmentary Constellations

The landscape of the contemporary philosophy of mathematics consists in a great number of polarities that delineate in advance the space of possibilities for theoretical commitment. If the Deleuzo-Guattarian perspective upon evental production is that it ought to be thought as “inherently connective in nature,” the vast majority of work in the analytic philosophy of mathematics suggests that we prioritize disjunction over all. To wit, one commits a priori either to ontological/epistemological realism or idealism, unity or multiplicity, necessity or contingency. As Zalamea sketches, in terms of ontology, we are effectively induced to choose between a realism wherein we “must postulate the real existence of the universe of sets, to which we are granted access by a reliable form of intuition” and an idealism wherein we “must postulate a dissociation between mathematical constructs and their physical environments.” The situation is no different for epistemology. In each case, prior commitments that

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1 Deleuze and Guattari, *Anti-Oedipus*, 5.
presuppose the fundamental *homogeneity* of the field of mathematical practice
are required of the philosopher of mathematics. The absolutism of these grand
disjunctions could be no clearer than in Benacerraf’s infamous dilemma: given
the fact that mathematical knowledge *is* possible, and given mathematics’
surprising efficacy in describing the physical world, our choice between
ontological/epistemological realism and idealism throws us into a double bind. If
we decide upon ontological and epistemological realism, we are confronted with
the question of how we could possibly come to know anything about mind-
independent objects that cannot be encountered in nature. Likewise, if we decide
upon ontological and epistemological idealism we lose, as Shapiro writes, “the
desired continuity between mathematical language and everyday and scientific
language.”

It seems that the choice offered to the philosopher of mathematics,
given this structure, is to decide between two intolerable difficulties. Yet, what is
clear is that, as Zalamea writes, “this either-or dilemma would not have to be
considered as such if we could take stock of other intermediate positions
between realism and idealism.” If, for Walter Benjamin, history does not take
shape “in homogenous and empty time,” neither does mathematics consist of a
homogenous and empty field of practices. The fundamental relevance of the
transits, mixtures, and movements of ascent and descent that, as we will show,
typify contemporary mathematical research indicates that it is a gross

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misconstrual of mathematics to elide the relative heterogeneity of mathematical objects, methods, and structures in favor of a convenient, flat ontology.

Yet, for many, the heterogeneity of these structures and methods is merely epiphenomenal, an outcome not of the essential heterogeneity of mathematical practice but, as Badiou writes, a result of “the unthinking despotism of number.” Indeed, in his *Number and Numbers* (2008), Badiou argues that the *longue durée* of attempts to define this thing that we call number is rife with instances of thinkers who, in his estimation, have been proven “incapable of defining any unified approach, any common ground, for discrete numeration (whole numbers), continuous numeration (real numbers), and ‘general’, or set-theoretical, numeration (ordinals and cardinals).” For Badiou, a mathematical ‘anarchy’ has been engendered along these lines. First, we define the natural numbers $\mathbb{N}$ by means of a particular axiomatic, whether by recurrence in the case of the Peano axioms or by a finite case of the theory of ordinals. Upon the set of naturals thus obtained, we symmetrize addition to obtain subtraction and, through group completion, produce the integers $\mathbb{Z}$. The process is repeated for the rationals $\mathbb{Q}$, here as the symmetrization of multiplication. However, a profound shift in methodology takes place when we try to define the real numbers $\mathbb{R}$ because we must shift our attention toward the topological, whether in terms of Dedekind cuts or Cauchy sequences, insofar as we rely on the canonically topological constructs of the metric space or the order topology, respectively, to produce the desired density of the real numbers.

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7 Ibid.
Lamenting this state of affairs, Badiou writes, “All that the thinkers of number have been able to do is demonstrate the intellectual procedures that lead us to each species of ‘number’. But, in doing so, they left number as such in the shadow of its name. They remained distant from that ‘unique number which cannot be any other’, whose stellar insurrection Mallarmé proposed.”8 This, for Badiou, is the definition so long deferred of the Mallarméan number. Under the sign of a stellar despotism, Mallarmé is taken to be lauding a unitary mathematical object under which all other mathematical objects should be thought. This would be a universal Number for all numbers, effectively a naïve mobilization of that Deleuzian univocity of the “single and same voice,”9 but only in a limited, numerical case and without the conditional demand for the excess state of difference upon which Deleuze insists. Mallarmé, here, is rendered as the harbinger of a messianic and unitary foundation that all numbers, irrespective of any and all distinctive marks, can claim as their ground. It is in the spirit of recovering this hidden, putatively Mallarméan promise of unicity that Badiou declares his desire to attempt “the passage to a second modernity”10 in the thinking of number. This universalizing modernity takes its form in ‘rediscovering’ a common thread between the plurality of numeric particulars that would induce us to recognize each “as subspecies of a unique concept of number, itself statutorily inscribed within the ontology of the pure multiple,”11 viz., as special cases of the ‘surreal’ numbers of J.H. Conway, which are

9 Deleuze, Difference and Repetition, 304.
10 Badiou, Number and Numbers, 13.
11 Ibid., 9.
sufficiently expansive to define all of the species of numbers outlined above. His intuition is simple enough, if we are to think the concept of number in a way that is not split up on the basis of the methodologies we use to construct the various species of number, we ought to adopt a single subsumptive model that unifies that which Badiou identifies as too diverse. Badiou, never far from his Maoist roots, seeks to reeducate numericity and to effectuate what Laruelle identifies as a “cultural’ revolution” not only within the purview usually granted to continental philosophy—but also within the foundations of mathematics.

Yet, Badiou commits the error that is so common in naïve realist approaches to the foundations of mathematics. If there exist multiple consistent and efficacious models for a mathematical concept, how can we possibly justify declaring that one or the other correlates to the mathematical real, while the others do not? Indeed, in our assumed distance from the debates over the proper foundations for mathematics that were characteristic of the late nineteenth and early twentieth centuries, it seems that we have forgotten to apply Alfred Korzybski’s famous maxim, “The map is not the territory” to our thinking of mathematical objects.\(^\text{12}\) By confusing a particular species of number, albeit a rich species in Badiou’s case, with the generic concept of number writ large, we have placed synecdoche at the very center of our formal sciences. To call a thing by a model for one of its parts is surely useful in many cases, but also must be regarded as a particular form of reduction that is invariably equipped with a

coeval violence to the territory under investigation. Illustrative here are the divergences and resonances between the works of two thinkers, Gottlob Frege and Charles Sanders Peirce, who, like Badiou and Deleuze, stand in a relation that combines intimate proximity and irreducible distance. While each independently developed full notations\textsuperscript{13} for first-order logic, it is clear that a significant contrast is to be found in their conceptions of what their logic should be used for—and to what extent a particular model is to be seen as the definitive model for a concept.

On the one hand, inasmuch as Frege had as his goal the task of “freeing thought from the taint of ordinary linguistic means of expression,”\textsuperscript{14} we observe a purification of language, a replacement of those common means of expression and knowing in favor of an abstract system less recalcitrant to logical analysis. While there is certainly nothing wrong with treating logic as a formal system apart from natural language, the supposed priority of one particular formal language induces a forgetfulness of the originary concepts that the logic was meant to model and therefore a confusion of the sign with its referent. This ethos of forgetful replacement was not limited to the particular form of logicism expounded by Frege and his immediate successors. As the logician C.I. Lewis wrote in a personal letter to Hao Wang, we find in so much of the analytic philosophy that bears Frege’s mark a desire “to get impressive ‘results’ by replacing the vaguer concepts which convey real meaning by virtue of common

\textsuperscript{13} Cf. Frege’s \textit{Begriffsschrift} (1879) and Peirce’s “On the Algebra of Logic” (1880).
usage by pseudo-precise concepts which are manipulable by ‘exact’ methods.’\textsuperscript{15} Let us call this the *analytical approach*, which we see exemplified in the supposition that set-theoretic *models* of the continuum—for instance, that of Cantor—exhaust the richness of the *concept* of the continuum. The identification of the continuum with the Cantorian real line, as Zalamea holds, “serves to model *one* of the fundamental aspects of a generic continuum,”\textsuperscript{16} *viz.* the property that in between two elements of a continuum, one can always find another one. However, this is just one aspect among many conceivable properties attributable to the concept of the continuum. Why insist upon the subordination of continuity to the *numerical* density of the Cantorian real line instead of, for instance, subordinating numericity to the *conceptual* density of the Leibnizian continuum? That this particular model is considered sufficient is less a matter of its practical adequacy and more a matter of the normative identification of some dominant model and the object that it is said to be modeling.

This is precisely what is proposed in Peirce’s thinking of the continuum—and in the pragmaticist maxim *writ large*. As Zalamea writes, under Peirce’s system, “to know a given sign (the realm of the *actual*) we must traverse the multiple contexts of interpretation capable of interpreting that sign (the realm of the *possible*) and, in each context, study the practical imperative consequences associated with each one of those interpretations (the realm of the *necessary*).”\textsuperscript{17} Insofar as we consider the many possible interpretations for a given sign, we are


\textsuperscript{17} Zalamea, *Synthetic Philosophy of Contemporary Mathematics*, 114.
not led to effect the kinds of ‘replacements’ that Lewis derides above. If we are working through a sign’s possible entailments across several contexts, some given and some modal, there can be no assumption of universality or complete adequacy on the part of any one of the contexts. It is always possible—perhaps even likely—that different contexts will result in fundamentally different entailments. An understanding richness of any given concept emerges not in one particular context, but in considering together many partial models, each of which approximates some aspect or range of aspects fundamental to the concept.

Is the Badiouan analytic outcome the only possible ontology obtainable from a rigorously mathematical reading of the stellar number and of Un coup de dés more broadly? Is the unicity of the ‘stellar number’ to be held in radical contradistinction to the plurality of events—that the ‘stellar number’ represents an ultimate analytic background for all times and for all throws? Or, instead, can the synthetic thinking of the dice-throw, with Peirce and contemporary mathematics, open up a field of possibility for a plural and contextual understanding of how the emergence of this ‘stellar number’ is in each case locally grounded, receiving only a partial modeling from the circumstances of the dice-throw?

Stellarity and Non-Foundations

If, as explicated earlier, Deleuze’s reading of Heidegger hinges upon an indictment of the widespread failure to realize that the Heideggerian Not “refers
not to the negative in Being but to Being as difference,”¹⁸ so too might we identify difference, rather than negation, at the heart of Félix Klein’s contribution to the then-nascent field of non-Euclidean geometry. It was precisely this syntagma, the subtle non-, which incensed Frege so profoundly that he claimed that, lest we wish to consign Euclid’s axioms to the dustbin of history, “non-Euclidean geometry will have to be counted amongst the pseudo-sciences.”¹⁹ However, against Frege’s suggestion that “whoever acknowledges non-Euclidean geometry to be true must reject Euclidean geometry,”²⁰ the simple falsification of Euclidean geometry was not an intended or incidental outcome of Klein’s work. The mutual exclusivity of Euclidean geometry and non-Euclidean geometry is not, moreover, a necessary outcome of digging deeper into the plurality of possible notions of space. Indeed, unique to Klein’s work, properly understood in its most mature stage in the form of his Erlangen program, was a gesture that served to formalize the coexistence of geometries on the basis of their relationality, not their subsumption under some transcendent notion of space.

The construction of a non-Euclidean geometry is more or less trivial on a conceptual basis. Euclid, in his Elements, postulated five distinct axioms upon which he would base all of his theorems: that one can draw a straight line from one point to another; that one can inscribe a finite straight line within an extant line; that one can trace a circle with any center and any diameter; that all right angles are equal to each other; and that, “if a straight line falling on two straight

¹⁸ Deleuze, Difference and Repetition, 64.
²⁰ Ibid., 251.
lines makes the interior angles on the same side less than two right angles, the
two straight lines, if produced indefinitely, meet on that side on which are the
angles less than the two right angles.”21 This bizarrely complicated last postulate
has come to be known as the parallel postulate, and behind the difficult language
is a simple notion. If we suppose that there are two (infinitely long) straight
lines, \( L_1 \) and \( L_2 \), given a third line, \( L_3 \), intersecting \( L_1 \) and \( L_2 \), the sum of a pair of
the interior angles generated by this intersection indicates whether or not \( L_1 \) and
\( L_2 \) are parallel. If the sum does not equal 180 degrees, \( L_1 \) and \( L_2 \) are not parallel.
If it does, they are. Because the parallel postulate is independent from the other
four axioms outlined above, one can deny or replace the parallel postulate while
retaining many of the other basic properties of a Euclidean geometry. A non-
Euclidean geometry is simply one in which the parallel postulate, for whatever
reason, does not hold in the way intended by Euclid. Klein recognized two
distinct species of non-Euclidean geometry: the Lobachevsky-Bolyai-Gauss or
hyperbolic22 type, and the Riemannian or elliptic23 type.

Klein announced a rather striking finding with respect to the
relationships between the hyperbolic, elliptic, and Euclidean geometries in his
"Über die Sogennannte nicht-Euclidische Geometrie" (1871). In this, the inaugural

21 Euclid, *Elements*, trans. Thomas Little Heath and Dana Densmore (Santa Fe, N.M.: Green Lion
22 This might be understood most intuitively as doing normal Euclidean geometry on a sheet of
paper that is gently curved so as to look like a saddle. The parallel postulate is replaced: instead
of two lines running next to each other with a constant distance between the two, they curve
away from each other.
23 The canonical model for the elliptic type is a sphere. The parallel postulate is replaced:
contrary to the hyperbolic model, lines with a common perpendicular will tend toward each
other. In other words, for any given line \( L \) and some point \( A \) that is not on \( L \), every line that
passes through \( A \) will intersect \( L \).
text of the Erlangen program, Klein took up the task of unifying under a formal and general principle these various geometries, whether Euclidean or non-Euclidean, in a manner radically opposed to the reductionism advocated by Badiou on the question of number. This is to say, as Jean-Pierre Marquis observes, “Klein’s insight was that a space could be studied as an object in itself, from a global and external point of view. One then associates to a given geometric system an algebraic structure that captures its basic and essential properties.”\(^\text{24}\) Though Klein’s argument hinged, in some respects, upon the claim that one ought to regard Euclidean, hyperbolic, and elliptic geometries\(^\text{25}\) as subspecies of the complex projective geometry, it is evident that behind the transitory privileging of this particular notion of space, the Erlangen program’s emphasis on algebraic structure as a synthetic, descriptive mechanism permitted Klein, as Hermann Weyl argues, to break the back of the “dictatorial regime of the projective idea in geometry” in establishing a “democratic platform in geometry, establishing the [algebraic structure of the] group of transformations as the ruling principle in any kind of geometry, and yielding equal rights of independent consideration to each and every such group.”\(^\text{26}\) That one can study a given space from an external point of view suggests the possibility of exceeding the fundamentally analytic point of view that the only meaningful investigation


\(^{25}\) As well as some lesser-known species of space, including conformal geometry, descriptive geometry, Plücker’s line geometry, Möbius’ inversive geometry, and an inchoate form of topology.

of a given mathematical construction is in terms of its constituent parts. In this case, we are far more interested in examining how the algebraic structures identified with each geometry relate to one another.

It is in this sense that Samuel Eilenberg and Saunders Mac Lane proposed that their newly developed category theory, called in this early stage a ‘general theory of natural equivalences’, might “be regarded as a continuation of Klein’s [Erlangen program], in the sense that a geometrical space with its group of transformations is generalized to a category with its algebra of mappings.”

Though, to be precise, the focus in Eilenberg and Mac Lane is upon what is now called the theory of 2-categories, the seeds of the basic categorical point of view are surely present here: given a generic collection of objects equipped with relations between these objects, we have an extraordinarily general means by which to articulate the ways in which the information contained within mathematical structures is communicated.

Because the category theory is a general language with which we can easily characterize structure, it has been adopted as one of the main contenders for a formal system in which mathematical structuralism can be carried out.

However, for far too long, mainstream philosophy of mathematics has operated under the assumption that the development and adoption of a strong, unitary foundation is not only philosophically desirable, but also mathematically

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28 At this point, a 2-category is perhaps best understood as a meta-category (i.e., a higher-order category that has as its objects a class of lower-order categories, called 0-cells) that is equipped with meta-relations called 2-cells (i.e., higher-order relations that relate lower-order relations, called 1-cells, between the 1-categories).
necessary. Yet, as was demonstrated in chapter two, the existence of intermediate deductive systems poses a serious challenge to the conceit that unicity is best when it comes to axiom systems in mathematics.

To think of the category theory as simply another road to foundational monism is to ignore the extent to which it can lead to a thinking of a non-foundation for mathematics. By this, I mean to suggest the very same ‘non-’ that characterizes the Kleinian approach, with an eye to the fragmentary vision of mathematics established above, category theory serves as a means by which an enormous plurality of structured spaces can be thought. This is not a subsumptive move insofar as we are not compelled to conceive of these fragments as ‘special cases’ of categories. To think from a categorical point of view is, as Zalamea writes, to establish “a [counterpoint] to the set-theoretical analytic championed by Cantor’s heirs” in the sense that “category theory no longer dissects objects from within and analyses them in terms of their elements, but goes on to elaborate synthetic approaches by which objects are studied through their external behavior, in correlation with their ambient milieu.”

In this sense, the category theory might be thought of as a formal model of Pierce’s pragmaticist maxim insofar as it does not necessarily have to be understood as giving ground to the signs under investigation, but rather as explicating in each case how the differential contexts within which a mathematical object is constructed induce differing entailments depending on the interactive relationship between context and object.

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29 Zalamea, *Synthetic Philosophy of Contemporary Mathematics*, 121.
To think back through Badiou’s proposal for subsuming the diversity of number under a single concept of Number, the alternative here is to think of some quasicomplex concept of number that is reflexively generated through its instantiations within the various formal contexts of the category theory. The general notion of a number, in mathematical sense, does not preexist these contexts in the sense that the sign is altogether meaningless in a formal sense if we cannot contextually determine its entailments. It is only in the last instance and through an intuitive process of synthesis that the various instantiations of number can be gathered under some corresponding general concept, but this is a concept that, insofar as it was born of instances that differed in their entailments, is never fully comprehensible as a single concept. It is, rather, much more in line with a bricolage, wherein the juxtaposition of the various contextually grounded instances of number does not result in their subsumption but rather in a productive coexistence.

It is surprising that, while Badiou has published no fewer than three texts\(^30\) that concern themselves substantially with category theory, he has refused to seriously consider it as an alternative to his set-theoretic ontology, preferring instead to think of category theory as that which explicates the appearance of the ontic, not the characteristics of the ontological. Fundamentally, this is not a question of Badiou’s unfamiliarity with the field, his texts on the subject are fluent and demonstrate an expertise with the technical

aspects category theory and related areas of study. It is, however, a refusal to take seriously the ontological potential of a certain application of the theory. Because Badiou refuses to engage seriously with alternative forms of the contemporary practice of mathematical research, as we have discussed, he is blind to the ways in which the category theory is an attempt to account for the present understanding of mathematics as essentially discontinuous. In short, he refuses the theory because he comprehends it only on the level of its ontic results, not its ontological implications.

The Grothendieck-Event

A question confronts most conceptual histories of twentieth century theoretical physics: What changed most profoundly with the massive acceptance of Einstein’s general and special theories of relativity? On the one hand, we surely gained new empirical tools for the rigorous characterization of particular ontic phenomena. Take, for instance, the case of the unusually fast precession of Mercury’s orbit around the Sun. This has been observed as early as in 1859, when the French mathematician Urbain le Verrier wrote in a letter to his colleague Hervé Faye that, in his studies of celestial mechanics more broadly, he had encountered on several occasions “difficulties in establishing a complete concordance between

31 In Newtonian celestial mechanics, the simplified model of a single object orbiting a spherical mass indicates that the path of this object would be an ellipse with this spherical mass as its focus. The point at which the object is closest to the focal mass is called the periapsis, or, in the case of our Solar System, the perihelion. Due to several factors including the perturbations resulting from the gravitational pull of other planets and the oblateness of the Sun, the perihelion is observed to precess gradually: the entire orbital path of the object is found to rotate about the focal mass.
[Newtonian] theory and [his] observations.” In particular, le Verrier found that Mercury underwent precession at a rate roughly 38 arcseconds per century faster than what was predicted by the Newtonian model, even after accounting for the oblateness of the Sun and the various gravitational perturbations that resulted from Mercury’s interactions with other celestial bodies. Le Verrier toyed with several explanations on the grounds of Newtonian theory, culminating in his suggestion of “the existence of a series of corpuscles [i.e., asteroids] circulating between Mercury and the Sun.” The late nineteenth and early twentieth centuries were rife with attempts at resolving this anomaly. Each proposed solution had its proponents for a time but in the end there was no consensus. The post-Verrier solutions either continued to insist upon a theretofore-unknown celestial body or suggested ad hoc modifications to the Newtonian framework. Yet, as Abraham Pais notes, in each case “the anomaly remained puzzling” in the sense that no adequate modification could be made to the extant framework, whether empirical or theoretical, that would not have unintended and unacceptable consequences. It was not until Einstein’s general theory of relativity that the difference between predicted and observed perihelion precession were accounted for in a satisfying way. Rather than

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33 It has been shown that the difference between (Newtonian) theoretical and observed precession of Mercury is closer to 43.03 arcseconds per century (Cf. G. Clemence, “The Relativity Effect in Planetary Motions,” Reviews of Modern Physics 19, no. 4 (October 1947): 362). The problem of anomalous precession, of course, still stands from the perspective of non-relativistic physics.


positing the existence of ‘invisible’ celestial bodies or modifying Newtonian mechanics in piecemeal ways, Einstein’s elegant explanation, carried to computational fruition by Karl Schwarzschild, was to, in short, show that a solution was attainable from his field equations that agreed with the observed phenomenon.

But was this all? I argue that we profoundly devalue Einstein’s theories of relativity if we think of them purely in terms of their empirical content: the 43 arcseconds or 0.012 degrees per century that the general theory accounts for does not exhaust its impact in physics and in thought more broadly. Indeed, as Tian Yu Cao writes, “[The] empirical content of Newtonian physics has been modified only slightly by Einstein’s theory of relativity, yet no one would deny that this is a great step in the development of physics, since the old ideas about Euclidean space, absolute time and absolute simultaneity, and action at a distance were swept aside, and the world picture thereby changed.”36 It is an impoverished reading of the explanation of some phenomenon that refuses the profound changes that such an explanation might induce in the structures that we mobilize in order to understand the ‘local’ empirical claims of a theory in terms of a comprehensive world picture. To be sure, we should not undervalue the extended explanatory power of physical theory but, more profoundly, the fact that this extension bore with it a shift in what we understand to be the basic structure of the cosmos cannot from any perspective be thought of as anything

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less than a sea-change that ramifies through not only physics, but also
philosophy, literature, and so many other fields of human inquiry.

This valorization of that which exceeds the empirical contents of a theory
should be extended beyond the physical sciences. Whatever our philosophical
commitments, the broader ontological consequences of major moves in
mathematical practice must necessarily be attended to in mathematical
philosophy if we are to live up to Wilfrid Sellars’ proposal that the aim of any
philosophy “is to understand how things in the broadest possible sense of the
term hang together in the broadest possible sense of the term.”37 For insofar as
one might hope to engage with mathematics in a useful and intellectually honest
way within the realm of philosophy, one simply cannot suppose that the citation
of particular results amounts to an adequate philosophical engagement with the
material. That, for instance, the continuum hypothesis has been shown to be
undecidable in ZF, while a serious result in set theory, is not enormously
interesting in philosophical terms unless it is coupled with an understanding of
how the impact this has on the framework in which mathematics is practiced. It
is only if philosophy can find itself in continuity with empirical results as
mediated through their ontological consequences within mathematics that
philosophy will be capable of productively mobilizing mathematics in a way that
does not do violence to it.

Indeed, it should not seem too demanding to ask that any philosophy that
cconcerns itself with the idea of mathematics be responsive to the nature of

37 Wilfrid Sellars, “Philosophy and the Scientific Image of Man,” in Science, Perception and Reality
contemporary mathematical practice. It would be absurd to think that one could
do serious work in the philosophy of physics, for instance, without at least
considering the contemporary state of the field. Yet, what is perhaps the most
profound body of work in twentieth century mathematics has barely been
accounted for in even the most wide-ranging philosophical works. I speak here
of the impact that the diverse work of Alexander Grothendieck has had on
contemporary mathematical practice—an impact that, as Zalamea writes,
“should be fully understood as an ‘Einsteinian turn’ in mathematics,” and,
moreover, as “a vision that ramifies through all the mathematics of the epoch.”\footnote{Zalamea, \textit{Synthetic Philosophy of Contemporary Mathematics}, 270.}
This is no hyperbole. Since 1966, no less than ten Fields medals\footnote{To wit, those won by: Michael Atiyah (1966), for \textit{i.a.} work done on K-theory, established by Grothendieck in his 1957 generalization of the Riemann-Roch theorem; David Mumford (1974), for work on the moduli space for the set of algebraic curves of fixed genus, dependent on Grothendieck’s introduction of cohomology into the study of algebraic varieties; Pierre Deligne (1978), a student of Grothendieck at the Institut des Hautes Études Scientifiques, for the completion of Grothendieck’s work on the Weil conjectures; Alain Connes (1982), for his work on operator algebras, through Atiyah; Drinfeld (1990), Kontsevich (1998), and Voevodsky (2002), through Connes; and Perelman (2006), through Drinfeld, Kontsevich, and Voevodsky.} have been
won with work influenced to a substantial degree by the myriad contributions
introduced into mathematical thought by Grothendieck. As Colin McLarty
observes, even Sir Andrew Wiles’ proof of Fermat’s Last Theorem, arguably the
most famous result in twentieth century mathematics “as written and published,
mathematics after 1960 is equally the story of the transits and mutations of
Grothendieck’s work.
While the ontological effects of Einstein’s work become relatively clear with some work, a rigorous analysis of the implications of Grothendieck’s thought seems to remain recalcitrant to all but the most substantial exegeses. While a project of this magnitude is certainly not possible here, contained in his unpublished autobiography, Récoltes et Semailles, are a range of meditations upon his mathematical practice that suggest his perspective on the ontological stakes of the novel form of doing mathematics that he pioneered.

As Zalamea notes, Grothendieck’s thinking is “a vision of the foundations of mathematics that differs radically from the one proposed by set theory. Grothendieck’s ‘reading’ is a transversal one, in which an ultimate base is of no importance. What is under investigation, instead, is the base’s movement.” Grothendieck holds that “it is really through the discovery of new questions, and likewise new notions, and even new points of view—new ‘worlds’, in fact—that my mathematical work has turned out to be fruitful.” In his work, Grothendieck formalized the notion of a new mathematical ‘world’, and it was perhaps in the construction of appropriate worlds that his most profound work has been achieved. Such a ‘world’, effectively an enriched category that is called a topos, establishes a local universe of discourse for mathematics. Mathematics, under this particular model, rejoices in its fragmentary and local nature insofar as questions previously seen as intractable can now be interpreted in bespoke

41 Zalamea, Synthetic Philosophy of Contemporary Mathematics, 151.
42 Alexandre Grothendieck, “Récoltes et Semailles: Réflexions et Témoignage Sur Un Passé de Mathématicien,” Unpublished Manuscript (Université des Sciences et Techniques de Languedoc, Montpellier; et Centre National de la Recherche Scientifique, n.d.), 554, “...par la découverte surtout de questions nouvelles, et celle de notions nouvelles également, ou encore par des points de vue nouveaux voire des mondes nouveaux, que mon œuvre mathématique s’est avérée féconde..."
models of the mathematical universe. Just as a change in one’s frame of reference has the potential to massively simplify problems in relativistic mechanics, so too can one effect a change in formal frame of reference. Mathematics now is justifiably thought of as relative not in any sort of historical or social terms, but rather in its formal makeup. However, that mathematics is to be thought of in these relativistic terms is not to suggest that truth and meaning, in a postmodern turn, have been sapped from the field. Rather, just as Einstein’s theories of relativity were only incidentally perspectival insofar as their task was, fundamentally, to find invariants that persisted in excess of the movement of observers, Zalamea notes that “the point of a relative mathematics à la Grothendieck, once we assume the transit of mathematical objects, consists in finding suitable invariants (no longer elementary or classical) behind that transit.”

The reality of local mathematics does not mean that global regularities are no longer held in common across mathematical disciplines. Rather, the relativity and locality of mathematical practice has simply provided a new toolkit for the discovery of these invariants.

The thinking of a formal relativism that does not deny invariance is something that escapes Deleuze and Badiou simply insofar as their commitments to a self-sufficient philosophy refuse the possibility of thinking mathematics and philosophy together, rather than at arm’s length. Mallarmé did not have this problem; in that he considers poetry to be done by and not with language, as discussed in chapter one, he has no pretenses at the self-sufficiency

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43 Zalamea, Synthetic Philosophy of Contemporary Mathematics, 271.
of the poetic enterprise. *Un coup de dés*, under this reading, should then be amenable to something of an anachronistic reading wherein it is subjected to the local and relativistic mathematical thought we observe in Grothendieck’s work. Indeed, while the dice-throw is made to relate to a bifurcated but global field of the virtual in Deleuze and while, for Badiou, the exclusion of the event from ontology means that the dice-throw “occurs [locally] in the situation without being in any way virtualizable” in terms of its ability to be expressed in ZF, the very emergence of the constellation in Mallarmé is conditional upon the transit between the local and the global. As he writes, “Nothing will have taken place but the place, except”—and this is crucial—“as far as place can fuse with the beyond, a constellation.”

The maître’s situation is characterized by its locality in the sense that it depended upon the existence of the whirlpool, the rock, the siren, and the storm. Yet, in the case that out of his crisis comes a constellation, it must be that an invariant was to be found in the transit between the topos of the maître and the stellar beyond.

Deleuze and Badiou cannot think this transit because they have presupposed too much about the relationship between local and the global. Badiou denigrates the event and sets it up in opposition to an axiomatic apparatus so powerful that everything except the event looks global—the event, therefore, is simply never able to ‘fuse with the beyond’. Symmetrically, Deleuze celebrates the event and permits it entry into mathematics—but cannot think

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44 Badiou, *The Clamor of Being*, 75.
the possibility of the event \textit{not} relating to the virtual beyond. Yet, in Mallarmé, nothing is \textit{a priori}. Place might ‘fuse with the beyond’, but it also might not. It depends, in each instance, upon the throw of the dice.
Works Cited


