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Review of Alain Badiou's *Number and Numbers* (2008) Translated by Robin Mackay

Despite the fact that the book in question deals with some very important concepts that Badiou raises in his magnum opus *Being and Event*, it has only last year (2008) been published into English – 15 years after it was written. Thanks largely to the popularity of Slavoj Žižek, Badiou's work has found a larger audience in English-speaking countries, and, along with contemporaries such as Giorgio Agamben, is a figurehead for a philosophy that maintains a distance from the worldlessness of the postmodern landscape. In order to properly commit to Badiou's mathematical concepts I shall provide some context.

The context of Badiou's work

Badiou's work is focused largely on new ways of approaching themes of Being and the notion of Truth. Truth, for Badiou, is not an element that sits comfortably as an effect of ones situation (in the usual Satrean sense of the word) but rather an Event is the production of a Truth that disturbs the normal order of a situation. The example that Badiou was to give in later studies was the life of Saint Paul, who on the road to Damascus to arrest Jesus' rebellious followers, observed a vision that was to interfere with the arrangement of his situation and eventually see him rebel against the Jewish Law that he was previously maintained in, to make the word of Christ available to Gentiles as well as Jews – in other words, the Event of Paul rests in the realisation that he

is the founder of Christianity as such, a complete disturbance of his original project.

Badiou's political projects have been critical of the global capitalist project and the landscape of postmodernism. In Badiou's own words, our time is devoid of world in the sense that the subjects of the world are not able to locate any world situation, or, to utilise the term used by Frederic Jameson, any substance of global meaning or grand narrative for “cognitive mapping”. If we think about this in terms of what Sartre (one of Badiou's intellectual teachers) supposed, our existence has to resign itself to the fact that everything, in a wider theological sense (on the presupposition that God is dead and/or God does not exist), is meaningless. So on this supposition we make our own meaning in this world according to an alignment with already existing ideological meanings (such as political meaning). However, the postmodern landscape provides no such (I'm tempted to term it) second-order meaning, no proper global plan as such, even insofar as there is no dominant conspiracy or universal project (Žižek, in his inimitably brazen manner, suggests that even the Nazi's produced a sense of “cognitive mapping” in their production of the global Jewish conspiracy). Postmodernism aims to destroy investments in this kind of thinking (in a project commonly known as post-politics), and this provides the rationale for its criticism from Badiou et al.

For Badiou, the applicability of mathematical terminology begins here, in this instance he borrows Paul Cohen's technique forcing (the discipline used in order to provide results of consistency and independence in set theory) to recognise the dynamics of a given representation (for example an economic model). For Badiou, the subject can never fully force (that is, ruthlessly actualise their independence from) reality (in the sense of his/her political landscape), but the very concept of postmodernism (as a political landscape) already disturbs its own representation. That is to say, postmodernism withdraws from authorising a Truth since in postmodern logic, Truth can only be represented by relative truths, or mediated truths that have legitimation in Thomas Kuhn's notion of the paradigm. However, for Žižek apropos of Badiou, “the forcing and the refusal of actualization are ... two sides of the same constellation.” That is, postmodernism holds a barrier to any disturbance of actualising an evental Truth by supposing itself

independent of any such laws of Truth, when in actual fact the activity of refusing the disturbance provides the grounds for its status as a form of ideological meaning.

To recap, Badiou's agitation with postmodernism is its refusal to accept itself as correlative to an ideological meaning, albeit one that refuses to accept itself correlative to the laws that inhabit such a landscape, and not providing any referent for “cognitive mapping.” But, furthermore, Badiou acknowledges and criticises postmodern capitalism as an ideological meaning that incorporates its excesses (again as part of its logic and refusal the excesses can potentially take the form of anti-capitalism. As it has been comically evoked by Žižek, even Hollywood stars are anti-capitalist now, but, implicity, the form that this anti-capitalism takes is, crucially, fully incorporated into the capitalist project anyway) into the very fabric of its being. The emancipatory political intervention is put into jeopardy, which means that, as Žižek notes in Alberto Toscano's words, today's revolutionary must propose new Master-Signifiers that would provide “cognitive mapping.” So in the same sense that subject's engagement in his/her reality is woven into the subjective project, Number, as Badiou reminds us, plays a part in every part of our life; into the political, the economic, in the human sciences, sociology and medicine. And this is how he begins his historical undertaking.

The Engagement of the Number

Badiou's work has often been described as incorporating set theory, or more precisely Zermelo-Fraenkel set theory (ZFC: the standard in set theory). His utilisation of the theory in question aims to identify whether there is a withstanding relationship of Being to history, nature, the state and God. His mathematical pursuits, as we shall see, lead him to criticise the existence of the standard Greek theory of The One, which is philosophically unpalatable for Badiou since for him there cannot be any one overarching set (keeping in line with ZFC). Based on this criticism of The One, Badiou is led to discover that by these logical postulations we cannot conceive of a grand cosmos, a Whole Nature, or a Being of God, providing we base our hypotheses of these figures on the Universe's physical laws.

As has been previously mentioned, some of these concepts were dealt with in Badiou's *Being and Event* but Badiou decided to dedicate a whole book on the constellation of Numbers.Badiou begins his work by providing historical context of thought regarding Number, starting from Platonism and the theory of forms, detailing the Greek representation of Number as bracketed within the notion of the “World of Ideas” and the separate world of numerical existence. He deals with Frege's 'logicism' and his description of Number as a “trait of the concept” and neither transcendental nor empirical. He also swiftly engages with theories by Peano (and the Peano Arithmetic; logical postulates which are based on mathematical inductions) Dedekind (which focuses on real numbers – encompassing rational numbers like 5 or -5 and irrational numbers such as $\sqrt{2}$, infamously known as Pythagoras' constant, the first number known to be irrational, that is where a number cannot be expressed by two integers) and Cantor (the heroic initiator of the modern theory of the infinite) to provide Badiou with a framework in which to direct his criticism and assert his own mathematical principles.

For Badiou, the theory of Number, in consideration of the criticism of the theories he provides as a framework, must not omit three reflections; firstly that considerations of order, that is either ordinal numbers or the order type of a well-ordered set, must arise from the intrinsic, or ontological, definition of Number. In other words, Number is not simply a concept in operation (his obvious blow to Frege) but rather it is an actually existing entity “which can be thought in a structural and immanent fashion.” (101) Number is, as such, not constructed, but, its very being makes possible all of the constructions in which we engage (as mentioned before, Number plays a part in every part of our life).

The second consideration for Badiou is that it is ordinal Numbers that ground Number's material basis, “its natural ontological horizon.” Real Numbers themselves, Badiou reinforces, are non-natural deductions from this natural material (102). This is Badiou's attempt to ground the mathematical object (the abstract object that includes numbers, permutations – mapping of elements of sets to other elements of sets -, partitions – exclusive parts, blocks or cells to a set -, matrices – an abstract element that corresponds to other elements in a large abstract system -, sets, functions, and relations) to

its ontological referent, a topic highly contested by many mathematicians. And lastly, the third consideration is that traditional numbers are specific cases of the unified concept of Number, but do not exhaust it. There remains, for Badiou, a great immensity of Numbers that mathematicians have not thought of yet, again toeing the ZFC line.

With consideration to the numericality that Badiou is distancing himself from, Badiou is able to maintain that: 'Number is neither a trait of the concept, nor an operational fiction; neither an empirical given, nor a constitutive or transcendental category; neither a syntax, nor a language game, not even an abstraction from our idea of order." (211) As such, Badiou asserts that Number takes the form of a type of Being. But criticism such as that of John Kadvany pick up on the fact that Badiou produces many reasons why Number is not merely spectral, but less on why Number has a legitimate ontological status. Indeed there is some truth to this, and it is a concern when Badiou, instead of unpacking his mathematical ontology further, eagerly turns to the economy using his numericality to deal blows to the capitalist system (surely the most speculative of numericality, as Žižek has asserted, it is often thought that behind the numbers and the logic of capital circulation there are evil geniuses, when in fact this couldn't be more untrue, "the fate of whole strata of the population and sometimes of whole countries can be decided by the 'solipsistic' speculative dance of capital). It was surprising here that Badiou didn't make good use of another of his intellectual mentor's Jacques Lacan, whose integer-like theory of the gendered subject was that it is either Whole or partial, or in other words, that the material grounding for a negative integer is based on the existent penis and the penis as an absent referent, respectively. In this sense Number does not rest on the Idea or the immediate or the abstract, but rather it is mediated by our sexed position, that it is an observation that is appropriately woven into the fabric of our beings, that Number is as necessary an object for our Being as sexual difference. Perhaps in this light Badiou's staunch criticism of Constructivist mathematicians (who assert the necessity to find a mathematical object to prove it exists) would punch a little more weight.

On this premise, however, Badiou does hit the mark with a political appropriation of Numbers on the effects of capital numericality. For Badiou,

the “dance” of capital breaks down the thinking of number, an inhabitant of our Being. The question is, does capital itself fragment the legitimacy of value (in reference to the point Badiou makes when saying “Number ... it is claimed, underlies everything of value” (213)) – by manipulating value itself – or does it infiltrate other areas of social life in order to disturb our thinking of Number, say for example with the invention and marketability of the calculator, or the simplification of mathematics education? Certainly the point here, for Badiou, is that in terms of capitalism, value just doesn't add up (Badiou, incidentally, not invoking Marx here, perhaps a further suspicion that he is, as Bruno Bosteels imagines in his book *The Speculative Left*, a Communist without being a Marxist), and that, perhaps, capitalism has not properly theorised the relationship between labour and value. But also more than this, capital as a degree of power has closed itself off, has become an exclusive domain, and problematises, as a consequence, the domain of Numbers in general. Perhaps it is the hegemony of capital that is stopping mathematicians from thinking in terms of the “innumerable immensity of Numbers we have not yet thought or used”? (102)

Badiou's book should really be seen as a refutation of the hitherto history of mathematical theory, and its relation to the current political climate. But as it is, it should be seen as the groundwork to a wider mathematical ontology, which is no criticism, since if this is to be a grand mathematical theory, its going to have to unpack all hitherto mathematical theory, a large piece of work.

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