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Becoming and Continuity in Bergson, Whitehead and Zeno

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Although both Bergson and Whitehead respond to Zeno in their mature works they take opposing paths. For Whitehead Zeno's paradoxes are formative for his own conception of time and process such that there can only be, as he says, a «becoming of continuity»[1]. For Bergson, by contrast, Zeno's paradoxes are 'false problems' because essentially they rely upon a spatialized conception of time that covers over the "continuity of becoming". In this paper I will use Whitehead's and Bergson's contrasting approaches to Zeno to bring out their differing conceptions of time and process. The focus on Zeno will enable us to present a sharp contrast between their respective conceptions of becoming so that they can be viewed as inversions of each other. In the final section I will briefly compare Bergson's and Whitehead's methods insofar as these are related to their conceptions of time and their shared effort to "rethink the philosophy of absolute immanence", as the editors of this special issue put it.

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Introduction

Although both Bergson and Whitehead respond to Zeno in their mature works they take opposing paths. For Whitehead Zeno's paradoxes are formative for his own conception of time and process such that there can only be, as he says, a «becoming of continuity»[1]. For Bergson, by contrast, Zeno's paradoxes are 'false problems' because essentially they rely upon a spatialized conception of time that covers over the "continuity of becoming". In this paper I will use Whitehead's and Bergson's contrasting approaches to Zeno to bring out their

[1] This phrase from *Process and Reality* (New York 1929 [1978]) is about as far as Whitehead goes in the direction of atomicity but clearly indicates that Whitehead remains a thinker of becoming. Some well-known work in Whitehead scholarship (e.g. Christian, Kline, Leclerc) uses this emphasis to define an interpretive framework based around an ontological distinction between the active becoming of the occasion and its completed inactive being. More recently, Graham Harman asserts that Whitehead is not a philosopher of becoming at all but a thinker of determinate individuals. It should be clear from what follows that one of the key disputes between Bergson and Whitehead is about the nature of becoming and how to conceive it. In this respect although Bergson and Whitehead offer differing conceptions of becoming there is no real dispute that they are both philosophers of becoming.

differing conceptions of time and process. The focus on Zeno will enable us to present a sharp contrast between their respective conceptions of becoming so that they can be viewed as inversions of each other[2]. In the final section I will briefly compare Bergson's and Whitehead's methods insofar as these are related to their conceptions of time and their shared effort to "rethink the philosophy of absolute immanence", as the editors of this special issue put it.

We can begin to draw out the differences between Bergson's and Whitehead's accounts of Zeno through a brief comparison with Bertrand Russell, whose views on time are instructive for all students of process. In his *Principles of Mathematics* Russell argues that time can be represented on a geometrical line as a continuum of instants. Here mathematical continuity is synonymous with infinite divisibility and corresponds with the idea of a durationless instant or a set of moments fully present to themselves. On this view Zeno's famous arrow is, Russell claims, «truly at rest at every moment of its flight»[3] since it juxtaposes static points on a line. For Bergson Russell's mathematical continuity attests only to the spatial trajectory or static trace left behind in the wake of time's real movement. Time's real movement, for an 'evolutionist' (Russell's term) like Bergson, can only be grasped in its process or making, in what Bergson famously calls its durée. On this view Zeno's paradoxes are false problems derived from the application of this spatial trajectory to movement itself. But Russell rejects movement in this sense because for him motion is the occupation of different places at different times in a continuum without any relational or interpenetrating movement. As Russell says «there can be no transition from place to place»[4] and any relation to 'parts' of time must be "immutable". Russell's arithmetic or geometric view reduces time to a static, eternal present where, as he puts it, «every term is eternal, timeless and immutable; the relations it may have to parts of time are equally immutable»[5].

[2] For the opposing view to this see David Sipfle's interesting paper *Henri Bergson and the Epochal Theory of Time*, in P. A. Y. Gunter (ed., trans.), *Bergson and the Evolution of Physics*, Knoxville 1969, pp. 275-294. Sipfle argues that Bergson overstates the incommensurability between the temporal and the discrete, particularly in his first work translated as *Time and Free Will*, and that we can in fact find an 'epochal' conception of duration in Bergson's books after *Time and Free Will* that bears close resemblance to Whitehead. For Sipfle «Bergsonian duration is more discrete and Whiteheadian temporal epochs are less discontinuous» (p. 281) than some commentators realize. Sipfle recognizes, rightly, the developments in Bergson's thought but misses what appears to be Whitehead's own qualified move, under the influence of James, away from continuity and toward favouring an emphasis on atomicity in *Science and the Modern World* (New York 1925 [1967]) and *Process and Reality*.

[3] B. Russell, *Principles of Mathematics*, Abingdon 1903 (2010), p. 353.

[4] Ivi, p. 478.

[5] *Ibid.* Some of Russell's views on time appear to shift away from those presented here and begin to sound, at points, positively Bergsonian. For example, in his *On the Experience of Time* («The Monist», Vol, 25, n. 2, April 1915, pp. 212-233) Russell argues that the idea that one experience corresponds with a mathematical instant is «absurd». Russell says that the «present has no sharp boundaries» (p. 223) so that «two presents may overlap without coinciding» (p. 214). For more on "Russell's Hidden Bergsonism" see Milic Capek, *Bergson and Modern Physics*, Dordrecht 1971, Appendix I.

For Whitehead Russell's mathematical continuity is the temporal equivalent of what he calls «the extraordinarily naïve assumption of time as pure succession»[6]. Pure succession is the notion of time as indivisible moments or units that succeed each other but without any relation to each other. Each unit in the succession is a fully self-present identity. For Russell motion is the occupation of different places at different times in a continuum without any relational or interpenetrating movement. As we've seen there can be no transition from place to place for Russell and any relation to 'parts' of time must be "immutable". Whitehead compares pure succession to colour in that there is no 'mere colour' as such but always some particular colour. Similarly, there is no pure succession but always some «particular relational ground»[7] in terms of which succession proceeds. Pure succession, for Whitehead, is an abstraction from the fundamental reality of conformation[8]. Conformation divides the present and is at work in every moment from the beginning through causality. As Whitehead puts it, «time in the concrete is the conformation of state to state, the later to the earlier; and the pure succession is an abstraction from the irreversible relationship of settled past to derivative present»[9].

For both Bergson and Whitehead Russell's arithmetic or geometric view reduces time to a static, eternal present. Although Bergson and Whitehead share this critique of mathematical continuity they disagree on how to conceive of time as real or processual continuity. Real or processual continuity appears to have two faces, like two sides of a coin. What divides Bergson and Whitehead is which notion of continuity befits a process temporality and what is its relation to becoming.

1. Whitehead and the 'Becoming of Continuity'

In both *Science and the Modern World* and *Process and Reality* Whitehead argues for the reality of time as a "becoming of continuity" and it is Zeno who provides the guide. The structure of continuity can be traced to the condition of time since its general function in Whitehead is to mediate between past and future. For one element to be continuous with another it must conform to the immediate past and anticipate the immediate future. Continuity necessarily occupies a duration in which the present is immediately divided by conforming with a past that is preserved in the present and a future that is anticipated, invoked or elicited. Whitehead is very close to William James' famous descriptions of a 'specious present', albeit generalized beyond the stream of consciousness, to indicate that experience never captures the individual present moments of a

[6] A. N. Whitehead, *Symbolism: Its Meaning and Effect*. New York 1927, p. 34.
[7] Ivi, p. 35.
[8] Ivi, p. 38.
[9] Ivi, p. 35.

'now' but only a present that stretches back into the past and forward into the future[10]. The present is 'specious' in that it is never immediately available in an instantaneous now-moment, 'knife-edge' or atomic sensation as such but only in a block or epoch that stretches through a continuity of immediate past and future moments. However, like James, the 'block' or durational act itself for Whitehead is not a continuity; only the moments in the duration are felt continuously. Whitehead not only adopts the phrase 'specious present' and the idea that individual units of experience come in epochs but he also accepts James' view that although the percipient event is temporally extended the act of perceiving is itself a unity that is unextended and indivisible. In other words the 'content' of the units of experience or actual occasions undergo temporal extension but the 'form' remains unextended.

As we've seen for Whitehead conformation combines a spatializing moment which retains the immediate past and anticipates the immediate future but as a formal whole the experience is given as a unifying epoch or indivisible 'living presence' that doesn't have temporal extension. This is Whitehead's (and James') response to Zeno. As Whitehead puts it, «If we admit that 'something becomes', it is easy, by employing Zeno's method, to prove that there can be no continuity of becoming. There is becoming of continuity but no continuity of becoming»[11]. Units of experience or actual occasions become and they constitute together an extensive world in which only extensiveness becomes «but 'becoming' is not extensive»[12]. Becoming occurs within the process but the act of continuity occurs all at once so that reality grows for Whitehead, just as it does for James, by «buds or drops of perception»[13]. You can divide the experience analytically upon reflection but as it is immediately given it's all or nothing. Thus Whitehead writes, «the conclusion is that in every act of becoming there is the becoming of something with temporal extension; but that the act itself is not extensive in the

[10] In *Process and Reality* Whitehead explicitly borrows James' «argument from Zeno» (A. N. Whitehead, *Process and Reality*, cit., p. 68) found in W. James, *Some Problems of Philosophy* (Omaha 1911 [1996]). As James says, «either we must stomach logical contradiction, therefore, in these cases; or we must admit that the limit is reached in these successive cases by finite and perceptible units of approach – drops, buds, steps or whatever we please to term them, of change, coming wholly when they do come, or coming not at all» (*op. cit.*, pp. 184-185). In *Science and the Modern World* Whitehead simply appropriates the term 'specious present' that James made famous (which he in turn borrowed from E. R. Clay) and uses it for his own purposes. In the same book Whitehead claims that James inaugurates a «new stage in philosophy […]. [He] clears the stage of the old paraphernalia; or rather he entirely alters its lighting» (A. N. Whitehead, *Science and the Modern World*, cit., p. 143). Whitehead belongs to an Anglo-American empiricist and Jamesian process tradition that begins with Locke's conception of the mind as a succession of ideas and passes through Hume and the associationists to James Ward and C. D. Broad. In contrast, Bergson seems to have influenced James rather than been influenced by him and his empiricism has different, let's say 'continental', roots closer to Schelling, Nietzsche, and looking forward, Deleuze.

[11] A. N. Whitehead, *Process and Reality*, cit., p. 35.
[12] *Ibid.*
[13] Ivi, p. 68; W. James, *Some Problems of Philosophy,* cit., p. 155.

sense that it is divisible into earlier and later acts of becoming which correspond to the extensive divisibility of what has become»[14]. Whitehead distinguishes the 'form' of becoming, the structure of the act of experience, from the content in which something becomes in order to shore up the infinite regress that Zeno's paradox threatens. The epochal structure of occasions is supposed to put an end to temporal regression by being constitutive of itself and providing a unity and synthesis to the becoming that mediates reference. The act of becoming, as a non-temporal unity, thereby ensures that the chain of references doesn't continue without origin or end.

Thus, Whitehead insists in several texts, especially *Process and Reality*, that time is atomized and epochal. As we've seen, and following James, for Whitehead reality grows in drops and buds and so time cannot be thought as a continuity. As Whitehead says, «temporalization is not another continuous process. It is an atomic succession. Thus time is atomic (i.e, epochal), though what is temporalized is divisible»[15]. Whitehead arrives at this position as a result of his analysis of Zeno. If we analyze the act of becoming with the premises that something becomes, and that every act of becoming is divisible into earlier acts of becoming, then we end up in the contradiction of an infinite regress where nothing becomes. To use Whitehead's example, if we take an act of becoming during one second we can divide that act into two, namely, the act of becoming in the first half of the second and the act of becoming in the second half of the second. Operating with the above premises «that which becomes during the whole second presupposes that which becomes during the first half second. Analogously, that which becomes during the first half second presupposes that which becomes during the first quarter second, and so on indefinitely»[16]. If we consider the process of becoming up to the beginning of the second in question and ask what becomes Whitehead concludes that «no answer can be given»[17]. Infinite regress leads to a contradiction in the notion of becoming because if the act of becoming is itself temporally divisible it cannot act as a synthetic unity for something to become but must itself be subject to further acts of becoming. Fundamentally, for Whitehead, no movement or process of reality can be self-constituting if it is subject to the temporalization of pure becoming. Indeed, «these conclusions are required by the consideration of Zeno's arguments»[18].

We can summarize Whitehead's argument for the becoming of continuity in two key philosophical moves:

P1. Zeno's valid argument. Whitehead argues that although some of Zeno's paradoxes are mathematically inadequate with some modification one can find, for example in 'The Arrow' paradox, a valid argument. The valid argument is:

a) in a becoming something becomes.

[14] A. N. Whitehead, *Process and Reality*, cit., p. 69.
[15] A. N. Whitehead, *Science and the Modern World,* cit., p. 126.
[16] A. N. Whitehead, *Process and Reality,* cit., p. 68.
[17] *Ibid.*
[18] *Ibid.*

b) becoming is divisible into earlier/later phases that go on indefinitely.
c) therefore, nothing becomes.

P2. Whitehead's response to Zeno's valid argument is to generalize James' notion of the 'specious present' beyond the stream of consciousness to all actual occasions. James' notion operates on the basis of an intuited duration within a non-extended or momentary act of awareness. For Whitehead the deployment of the specious present is a solution to what we can call the 'paradox of becoming' found in Zeno's valid argument. It is a solution because with this move actual occasions can be construed as becomings whose 'data' can be synthesized and unified in an epoch without infinite regress.

This structure of time underlying the process of experience can be usefully contrasted with Bergson who argues that the key to processual time is the continuity of becoming. The continuity is construed in such a way that the paradox of becoming for Bergson is a 'false problem'.

2. Bergson and the 'Continuity of Becoming'

Bergson's continuity of becoming is based on a rejection of Whitehead's two key philosophical moves identified above. Firstly, Bergson rejects P1. Bergson's challenge is directed if not at the validity of Whitehead's Zeno argument then at the truth of its premises. The premise that 'something becomes' is directly challenged by Bergson's conception of duration as a pure movement without an underlying 'thing' that becomes. The premise that becoming is infinitely divisible is, for Bergson, to treat becoming in terms of a mathematical instant or a geometric point. These latter are abstractions good for action but not speculation. Secondly, Bergson rejects P2. Duration is an indivisible continuity that doesn't require a non-temporalized atomic act to hold it together. Rather, as we shall argue below, temporal features of becoming – continuity, heterogeneity, in short "qualitative multiplicity" – give duration its degrees of intensive unity and synthesis.

Bergson realized early on that mechanistic systems, and more generally 'positive science', could not come to terms with real duration[19]. Positive science is rooted in a metaphysics that goes back to the school of Elea which substitutes the concept, or the Idea, for the percept. If the earliest thinkers attempted to break with action by turning away from the percept to the Idea for Bergson they did so on the basis that they could grasp movement directly. At the beginning of Western metaphysics, Bergson claims, it is Zeno who, by drawing out the contradictions of movement and change, «led the philosophers – Plato first and foremost – to seek the true and coherent reality in what does not change»[20]. But why did they turn to what does not change? For Bergson it is because these philosophers believed that in its ordinary operations perception and consciousness

[19] H. Bergson, *Bergson Key Writings*, New York 2002, p. 362.
[20] Ivi, p. 255.

deliver change and movement to us. From there it can shown easily that change leads to insoluble contradictions and the creation of the paradox of becoming.

Zeno's paradoxes for Bergson all attempt to show that movement and change lead to insoluble contradictions but all trade on an illusion whereby real movement is confused with immobilities or static self-identical units. For Bergson this is because we associate the movement with the line or spatial trajectory that comes in the movements wake. As Bergson puts it, Zeno's «illusion arises from this, that the movement, *once effected*, has laid along its course a motionless trajectory on which we can count as many immobilities as we will. From this we conclude that the movement, *whilst being effected*, lays at each instant beneath it a position with which it coincides»[21]. What Bergson means here is that we think of movement and change in terms of immobile states that are pieced together to constitute the change or movement. Although we talk about change Bergson thinks that we «reason and philosophize as though change did not exist»[22]. The example Bergson returns to again and again is the simple movement of my arm from A to B. Our habits of thought are such that to understand this movement we divide the space between A and B into so many immobile points in between. But, Bergson says, change and movement cannot coincide with the immobile and simply present points of the space through which my arm moves. This habit of thought may be good for action but not speculation. If we apply this habit of thought to speculation Bergson says that «you at once cause insoluble metaphysical problems to arise». In other words Zeno creates these contradictions out of his paradoxes because he transfers to the moving body the properties of its trajectory. In the interests of utility, common sense and language collude in this transfer by treating movement and change in terms of space. As Bergson says common sense and language have a right to do this since «they have no more concern with the interior organization of movement than a workman has with the molecular structure of his tools». This is what Bergson calls 'spatialization' and has been the source of much confusion and misunderstanding, not least on the part of Whitehead. That Whitehead misunderstood aspects of Bergson's spatialization is clear when Whitehead says that «Bergson went further and conceived this tendency as an inherent necessity of the intellect»[23]. Whitehead goes on to say that he 'doesn't believe' Bergson on this point. However, spatialization cannot be an «inherent necessity of the intellect» for Bergson because it would undermine various aspects of his own thought. For example, 'intuition' could not get off the ground if spatialization were an inherent necessity because intuition relies, in part, upon a transformed mode of intellectual activity. In addition, Bergson's claim that the intellect has evolved, and continues to evolve – and spatialization is a product of that evolution – would not make any sense. The whole of Bergson's thought is grounded in the claim that there are no inherent necessities in the universe. In addition, Whitehead is critical not just of Bergson's alleged

[21] H. Bergson, *Creative Evolution*, Mineola 1911 (1998), p. 309.
[22] H. Bergson, *Creative Mind,* New York 1946, p. 131.
[23] A. N. Whitehead, *Process and Reality,* cit., p. 209.

focus on inherent necessity but also his focus on the intellect. This is a more interesting criticism particularly if we make a distinction in Bergson between intellectualized matter and matter itself. For Whitehead, spatialization isn't just a «distortion introduced by the intellect»[24]. Rather, «spatialization is a real factor in the physical constitution of every actual occasion belonging to the life history of an enduring physical object»[25]. At risk of adding to the confusion here we might say that for Whitehead spatialization is an 'inherent necessity' at least as far as it concerns the physical constitution of every actual occasion of an enduring physical object.

It is 'intuition' in Bergson that struggles with spatialization. The French philosopher Gilles Deleuze has stressed that intuition is a method in Bergson. It is, as he puts it, «one of the most full developed methods in philosophy»[26]. Thus, as a fully worked out method intuition ought not be contrasted with intellect as such. Rather it should be contrasted with the habitual and spatialized modes of intellect. Intuition is a labor or effort to discard the common-sense forms of intelligence tied to utility in favor of new fluid forms of conceptuality capable of engaging «the immediate data of consciousness». The immediate data or content of intuition is of course *durée*. In response to Zeno, and P1 above, Bergsonian change needs to be conceived as pure mobility without a self-present underlying thing or substratum that supports the change and this is what duration is. Perhaps the key feature of duration is that it is an indivisible continuity and so this continuity cannot be conceived as a succession of self-identical and externally related units. Rather, without distinct elements there is just the continuity or flow of becoming. As Bergson puts it, «this indivisible continuity of change is precisely what constitutes true duration»[27]. For Bergson durée has a continuity, both a continuity that becomes *and* a continuity of becoming. Such a continuity cannot be represented by mathematical continuity, or the idea of indefinite divisibility – on this both Bergson and Whitehead agree. However, for Bergson becoming and continuity cannot be qualified by a non-temporal form. Such a form would itself require explanation and simply return us to the Eleatic paradoxes. Rather, the features that explain coming to be or becoming cannot be presupposed because they are in the making.

This leads me to the second key feature of duration: it is heterogenous. It is this feature that challenges and overturns P2 by showing how a multiplicity of elements in becoming form a temporal unity. In other words if the continuity of becoming implies creativity, novelty and the new there must be qualitative or heterogeneous differences in the continuity. Some may claim that an indivisible continuity of becoming eliminates distinctions between the phases of duration. But this would be to confuse an absence of divisibility with an absence of difference. Bergson's suggestion here is that there appears to be a contradiction

[24] Ivi, p. 320.
[25] *Ibid.*
[26] G. Deleuze, *Bergsonism*, New York 1988, p. 13.
[27] H. Bergson, *Creative Mind,* cit., p. 149.

between continuity and heterogeneity only if we insist on understanding the terms mathematically, quantitatively or in terms of certain presupposed logical principles (in Whitehead's case the principle of non-contradiction). But clearly Bergson wants to get at experiences that resist translation into mathematical, arithmetic or presupposed rational terms. One of Bergson's favorite examples is our experience of a melody. In listening to a melody we have an experience of a change that endures. Although the tone, the pitch and the timbre might be the same as a second ago what enables novelty to emerge is that the antecedent phase is still there providing a qualitative difference in our experience of past and present. Thus, continuity and heterogeneity of becoming are fused in the experience of the melody surviving in the past and emerging in the present. Equally, when we think about our inner life, Bergson says, there is no ego or self which functions as a substratum upon which a succession of states pass; rather «there is simply the continuous melody of our inner life, a melody which is going on and will go on, indivisible, until the end of our conscious existence»[28].

3. Final remarks – Immanence and Empiricism

For both Bergson and Whitehead applying mathematical continuity to real time leads to entanglements with Zeno's paradoxes. For Whitehead becoming appears to require a durationless act otherwise, as Zeno's 'valid argument' shows, nothing becomes. On this view temporalization would reduce to an infinite regress that converges to nothing so that «time would be an irrational notion»[29]. For Whitehead a solution to his (and James') argument from Zeno is given through a generalization of the specious present enabling the construction of a rational notion of time. The rational notion of time accounts for the paradox of becoming by grounding succession in a non-extended simultaneity, an 'epochal' act of temporalization. For Bergson this 'solution', requiring the positing of a durationless act, is in effect a restatement of the paradox of becoming and remains mired in the 'false problems' generated by Zeno's paradoxes. In order to avoid the contradictions of Zeno Bergson instructs us not to get outside of time or free ourselves of change but rather to return to «grasp change and duration in their original mobility»[30]. What this means for Bergson is that form itself is a continuity of becoming. The act of temporalization, in addition to the content, is itself a duration or, as Bergson puts it, «what is real is the continual *change of* form»[31]. Indeed, we could sharpen the contrast between them further by suggesting that Whitehead's commitment to the principle of contradiction is all too 'Eleatic' or 'Parmenidean' in that a non-temporal permanence or substantive element is required to make sense of becoming. Both philosophers want a

[28] *Ibid*.
[29] A. N. Whitehead, *Science and the Modern World,* cit., p. 127.
[30] H. Bergson, *Creative Mind,* cit., pp. 141-142.
[31] H. Bergson, *Creative Evolution,* cit., p. 302 (italics in text).

temporality of becoming and creativity and, in part, their images of time are fashioned out of their respective responses to Zeno yet they appear to end up with inverse images of becoming, continuity and time.

One way to evaluate process philosophies is by the extent to which they eliminate substance concepts, or their equivalents. Indeed, this is one way in which we could define what the editors of this special issue call 'absolute immanence'. On this more Bergsonian understanding absolute immanence would demand that everything is subjected to a genetic and temporal explanation without presupposing something non-temporal or that did not come to be or become. On this measure Bergson's conception of time appears to take us further because it doesn't have recourse to forms of non-temporal synthesis to hold the elements of becoming together. On the other hand, one could argue that for Whitehead the «separation of the flux from the permanence[32], including systems that are «thoroughly fluent»[33], like Bergson's, hinders the achievement of immanence in that it throws us back upon what Whitehead calls «the final Platonic problem»[34]. The final Platonic problem is to remain ensnared within the oppositional structures that constitute the horizon of Greek metaphysics. This is, of course, how Heidegger reads Bergson[35]. The achievement of absolute immanence in this Whiteheadian sense requires the articulation of flux and permanence as a «double problem» characterized in Whitehead's 'final interpretation' section of *Process and Reality*[36]. In other words, absolute immanence on the Whiteheadian process view involves a special coordination and harmonizing of substantial and non-substantial elements – essentially a philosophy of relations in which x is

[32] A. N. Whitehead, *Process and Reality,* cit., p. 346.
[33] *Ibid.*
[34] Ivi, p. 347.
[35] Although for Heidegger «Bergson's analyses belong to the most intense analyses of time that we possess» (M. Heidegger, *The Metaphysical Foundations of Logic*, Bloomington 1984, p. 203) he still considers Bergson's thinking on time, indeed the whole Western metaphysical tradition of time, to be locked into an Aristotelian conception of temporality. Very briefly, the Aristotelian conception of time for Heidegger is structured by an understanding of the 'now' as both limit and transition. As limit the now divides the past and future. As transition it connects them. If Aristotle accords primacy to the limit, for Heidegger, Bergson merely reverses this and has transition as originary and limit as derived. For Heidegger both thinkers remain within the opposition, fail to overcome the metaphysical conception of being as presence and, in the end, cover over the primordial essence of time (this would also apply to Whitehead). See M. Heidegger, *Being and Time*, Oxford 1929 (1962 & 1984). What should be clear here is that Bergson takes his notion of durée to be a reconciliation of continuity and heterogeneity such that the opposition between them is dissolved.
[36] For a more detailed analysis of the 'double-problem' in Whitehead see my *The Event and the Occasion: Deleuze, Whitehead and Creativity*, in N. Gaskill & A. J. Nocek (eds.), *The Lure of Whitehead*, Minneapolis 2014, pp. 207-230. In my view Whitehead's conception of the double problem in *Process and Reality* hasn't been given the attention it deserves by those working on these topics. One could read Whitehead's articulation of the double problem as a 'twisting free' of the Aristotelian conception of time. Of course if one reads it this way then the double problem is in real tension with Whitehead's notions of becoming and continuity as I have presented them here. One could frame this as a problem of consistency across the various levels of abstraction in Whitehead's system.

what it is only through something else – so that oppositions are converted into contrasts and permanence and flux are reconciled[37].

Perhaps these differences between Bergson and Whitehead are a reflection of their differing methods and approaches to speculative metaphysics and empiricism. Bergson and Whitehead are both 'radical empiricists'; that is, they are both committed to the methodological dictum that the abstract does not explain but must itself be explained by the concrete. But they do this in very different ways. Bergson's 'true' or 'superior' empiricism, as he sometimes calls it, is premised on a movement of experience (intuition) that takes one inside the thing so that one might know it immediately and absolutely. As Bergson says we enter into these 'states' of a thing – its becoming and continuity – through an effort of the imagination guided by intuition. Bergson emphasizes the «extreme difficulty» of this effort because for each object of intuition or duration one must cut a concept for that object. Bergson's empiricism is a kind of custom metaphysics that tailors the concept for each experience rather than utilizing a ready-made garment 'off the peg'.

In contrast Whitehead's empiricism is more indirect, speculative and approximate making use of off the peg concepts but modifying and transforming them in accordance with experience. Language and concepts are stretched beyond their ordinary use[38] to generate ever more refined descriptions of the larger generalities. Whitehead's radical empiricism can't take us directly and immediately inside experience because it constructs a set of general concepts for a mediated and relative interpretation that asymptotically approaches the real. Although we are to keep renewing these concepts, descriptions and interpretations, to believe they give us the final reality or the absolute is 'folly' for Whitehead. As a set of descriptions and interpretations that revolve around the thing *ad infinitum*, rather than entering into it, Whitehead's speculative empiricism is closer to what Bergson calls 'analysis'. In Whitehead's empiricism the imaginative effort or 'leap' doesn't take us inside the experienced thing but is directed toward conceptual creation guided by a set of principles that enable the generalization of specific notions beyond their immediate field of application. One key component of Whitehead's speculative method is that it relies upon what he calls a «rational side» that places constraints on how we understand the empirical content. Although Whitehead is critical of the dogmatism involved in beginning with axioms which are supposedly clear, distinct and certain and then building a deductive system upon them, speculative philosophy is still guided by what he calls «logical perfection»[39] and «speculative boldness must be

[37] Of course there are other permanent elements in Whitehead's scheme including God's primordiality and the eternal objects. Some have tried to reconfigure Whitehead's system without these elements. To just cite a couple of well-known examples: Donald Sherburne tries to think "Whitehead without God" and Charles Hartshorne can find no role for eternal objects. One could argue that all the modern process thinkers (e.g., Nietzsche, Bergson, Deleuze, etc) attempt to eliminate permanence and Whitehead is in fact the exception.
[38] A. N. Whitehead, *Process and Reality*, cit. p. 4.
[39] Ivi, p. 6.

balanced by complete humility before logic»[40]. In addition to abstracting from specific instances the generalizations are schematized into a coherent system that ranges beyond their immediate application such that they all presuppose or imply each other. With this the general concepts are applied to all of experience and the "empirical side" ('applicability', 'adequacy') of the method comes into play. Not only must the rational side exhibit logical consistency and coherence but Whitehead assumes that experience is also coherent such that there is some application. This assumption, a presupposed correlation (albeit approximate and indirect) between logical form and temporal process, is a default setting in Whitehead's method and so the contradictions of Zeno's valid argument are given an elevated role in the construction of becoming and continuity. Whitehead utilizes the principle of non-contradiction to reject the continuity of becoming but what if our best empirical observations and descriptions are in tension with or resist logical perfection?[41]

In contrast, Bergson's empiricism can more readily support an ontology that conflicts with *a priori* reasoning because it follows the contours of the real in search of a unique intuition. And it does so by avoiding one of the "great illusions" fostered by the intellect: that we can think the mobile by means of the immobile. Thus, Bergson can say that Zeno's Arrow presents a valid argument only «if we suppose that the arrow can ever *be* in a point of its course»[42], valid only if we presume that the movement of the arrow coincides with a position which is immobile. «But», Bergson writes, «the arrow never *is* in any point of its course»[43]. To think that the arrow is at a point in its course is, as Bergson says, to cut the course in two at this point and make two lines out of one. The illusion, as we've seen, consists in applying the movement to the line traversed but this possibility exists only for a detached observer who posits so many possible stops along the line and then tries to reconstruct real movement with these immobilities[44]. This illusion is part of Bergson's critique of the 'logic of

[40] Ivi, p. 17.
[41] Whitehead's position seems to vacillate between a metaphysics of relation in which logical principles breakdown and another metaphysics in which they are necessary. In the latter principles of identity and non-contradiction function as a necessary constraint placing a non-extended and non-relational act right at the heart of the construction of the actual occasion. In this metaphysics the world must conform to our thinking for it to be comprehensible and we fall into Whitehead's own famous «fallacy of misplaced concreteness». In the other metaphysics, for example, in Whitehead's description of the double problem, contradictions are «gratuitous» and «trivial», mere secondary or surface phenomena, and oppositions are converted into contrasts of intensive experience. In this metaphysics our concepts must follow and express the world. The adequacy and applicability of these models could be put to the test in relation to phenomena like quantum entanglement and I note the growing body of work connecting Whitehead and quantum physics.
[42] H. Bergson, *Creative Evolution,* cit., p. 308.
[43] *Ibid*.
[44] Insofar as this illusion is fostered by practical life Whitehead's claim that «whatever is found in 'practice' must lie within the scope of the metaphysical description» (A. N. Whitehead, *Process and Reality*, cit., p. 13) would qualify as an example of this illusion for Bergson, importing the practical biases of the intellect and action into the speculative.

solid bodies' and what he calls the «cinematagraphical method[45] and is carried right into the very notions of identity and contradiction. The contradiction disappears, Bergson says, when we place ourselves inside the movement and adopt the continuity of becoming through intuition.

In short: Whitehead's metaphysics is a set of abstractions for plumbing the depths, whereas Bergson would have us plunge in and immerse ourselves in the real.

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[45] H. Bergson, *Creative Evolution,* cit., p. 306.