

The Concept of Temporality in John Dewey's Early Works

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ABSTRACT

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It is well understood that a concept of temporality is central to Dewey's later work, finding its culmination in his essay "Time and Individuality" (1938). What has not been either acknowledged or established is the fact that a detailed and sophisticated concept of temporality, one which is fully in accord with his later work, was already present in Dewey's early work, particularly in his essay "The Reflex Arc Concept in Psychology" (1896). This thesis therefore seeks to demonstrate not only that such a concept of temporality exists in Dewey's early work, but also the nuanced nature of that concept of temporality, particularly in its function as a central, grounding component of the preconditions required for Dewey's concept of experience. The nature of Dewey's concept of temporality will be explicated through close analysis of Dewey's texts, particularly his Reflex Arc essay, his central statements on education contained in *Democracy and Education* (1916), and the comprehensive statement of his mature philosophy found in *Experience and Nature* (1925). With the nature of Dewey's early concept of temporality established, this thesis argues that it in fact constitutes a key contribution to a tradition of philosophy of temporality which starts with the work of Henri Bergson, continues with the philosophy of Martin Heidegger (most saliently with *Being and Time*), and finds its full contemporary statement in Gilles Deleuze's

work on time, based on his concept of 'the virtual.' The fact that Dewey's concept of temporality, as with that of Deleuze, is based on a sophisticated understanding of contemporary scientific findings, is also explored, with the argument made that possessing such a foundation in scientific thought allows Dewey's concept of temporality to become fully compatible to current research in psychology, particularly as it concerns educational psychology.

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LIST OF ABBREVIATED TITLES

AE — Dewey 1934/2005. *Art as Experience*. New York: Penguin.

AN — Dewey 1925/1958. *Experience and Nature*. Dover: New York.

B — Deleuze 1991/1966. *Bergsonism*. Translated by Hugh Tomlinson and Barbara Habberjam. New York: Zone Books.

BT — Heidegger 1962/1927. *Being and Time*. Translated by J. Macquarrie. Oxford: Blackwell.

DR — Deleuze 2004/1994. *Difference and Repetition*. Translated by Paul Patton. London: Continuum Books.

PVT — Slattery 1995. “A postmodern vision of time and learning: A response to the National Education Commission Report *Prisoners of Time*.” *Harvard Educational Review* 65.4: 612–633.

RCP — Dewey 1896. “The Reflex Arc Concept in Psychology.” *Psychological Review* 3.4: 357-370.

TI — Dewey 1938, 1940/1988. “Time and Individuality.” In *The Later Works of John Dewey*, (Volume 14), edited by Jo Ann Boydston. Carbondale and Edwardsville: Southern Illinois University Press.

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siderable pressures, logistical, geographical, and emotional, that have been wrought upon she who is closest to me.

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RJM

New York - Alverstoke - Paris
2008-2015

DEDICATION

*This thesis is dedicated to the memory of my mother and my
father*

Wendy Anne Macleod (née Eccles)
RN
28th July, 1946 - 14th December, 2013

Surgeon Captain Murdo Assynt Macleod
MB, ChB, MSc, RN
20th September, 1935 - 25th June, 2007

“I Birn Quil I Se”

Introduction: Dewey and Deleuze; temporality and time

“The past, like the future, is indefinite and exists only as a spectrum of possibilities.”
— Stephen Hawking

1. The aims of this inquiry

This thesis seeks to establish the following:

(1) That, contrary to present scholarship on the matter, a nuanced and sophisticated concept of temporality, and one fully in accord with that exhibited in his later work, can be discerned in Dewey’s early work, particularly his (1896) paper ‘The Reflex Arc Concept in Psychology’, and his seminal text, *Democracy and Education* (1916). This will be demonstrated with a close reading of Dewey’s Reflex Arc essay in Chapter 4.7, and also by showing that the resultant concept of temporality can be read into, and is fully compatible with, the key concepts and underlying logic of *Democracy and Education* (Chapter 5.8). (2) In the course of analyzing Dewey’s concept of temporality, we shall attempt to discern, and then demonstrate, the naturalistic foundations of his philosophy, foundations which ground his concept of temporality in the scientific thought of Dewey’s time. Further to this, it is hoped that through examination of these naturalistic foundations, it can also be shown that Dewey’s concept of temporality remains compatible with relevant findings emerging from contemporary scientific research. (3) Furthermore, in exploring these naturalist foundations, we will attempt to trace, then establish, significant links and parallels between Dewey’s work on temporality, and the work on time and temporality produced by the philosopher Gilles Deleuze; and also, through Deleuze’s reading of him, Henri Bergson. (4) In drawing out these links and parallels, we shall attempt to show that Dewey’s early concept of temporality represents a sophisticated and innovative contribution to the

field of philosophy of temporality - a field which, drawing on the point of departure provided by Immanuel Kant's work on the concept of time, was established in full by the phenomenological project of Martin Heidegger, particularly as it is found in *Being and Time*. (5) Finally, we shall attempt to demonstrate that, as a consequence of being based upon the aforementioned naturalistic foundations, the full scope of Dewey's concept of temporality thereby represents an ongoing opportunity through which his work can be brought in line with current psychological research and educational practice.

2. The risks of this inquiry

A sizeable risk attaches to a project such as this, however. In no particular order, we have the prospect of what might be regarded as a *comparison* between two philosophers. Necessarily, any kind of comparison involves both an exercise in *reduction* – and for this reason alone must be regarded as philosophically unsatisfactory – as well as an act of *judgement* – which, for this reason, makes the exercise – again, in philosophical terms – open to suspicion.¹

In fact, any attempt to avoid the dangers that attach to the nature of judgement might be advised to heed the following warning:

¹ Even Kant was able to identify one of the central limitations of an act of judgement, a central component of the operation of Reason: 'Reason does not in fact produce any concept, but at most *frees the concept of understanding* of the inevitable limitations of a possible experience...' Immanuel Kant, *Critique of Pure Reason* (Indianapolis/Cambridge: Hackett, 1996), 445 (A409/B435).

“Such is the world of *representation* in general. We said above that representation was defined by certain elements: identity with regard to concepts, opposition with regard to the determination of concepts, analogy with regard to judgement, resemblance with regard to objects... *difference becomes an object of representation always in relation to a conceived identity, a judged analogy, an imagined opposition or a perceived similitude...*” (DR, 137 – 8)

We shall do our best to both heed and explain this warning in the wider body of this thesis. For now, however, we recognize the need, when considering the relations between Dewey, Deleuze and Kant, to avoid the uncritical acceptance of the ‘rational’ model of judgement which has remained hegemonic in western philosophy since at least Aristotle’s time, and which features as one of the central facets of critique and critical philosophy in the work of Immanuel Kant.

There is the fact, too, that the central philosophers under consideration here – Dewey and Deleuze – are generally held to occupy seminal positions within the history of separate and opposing trends comprising western philosophy, namely the so-called ‘analytic’ and ‘continental’ traditions. While I believe that the putative ‘opposition’ between these two trends has been vastly overstated, it cannot be denied that the ‘continental’ tradition does appear to have a style and set of priorities quite different to those commonly identified as belonging to the ‘analytic’ tradition.²

² Cf. Manuel DeLanda’s concerns in his 2004 Introduction to *Intensive Science and Virtual Philosophy*. London: Continuum, p. 3.

That this danger is real cannot better be attested to than by the fact that a casual glance at the career of each philosopher will discover what appear to be mutually exclusive aims, preferences, historical and philosophical resources and so forth. Thus, Dewey wrote his doctoral dissertation on Kant, and was, at least for a time, considerably influenced by the Hegelian idealist tradition (Calore 1989, 12); whereas Deleuze is on record as stating that he regards Kant as an ‘enemy’³, and was particularly clear on the fact that much of his philosophical output was premised on the need to overcome the dangers and deficiencies attaching to any attempt to subscribe to the Hegelian worldview.⁴

Furthermore, though Dewey cannot, for historical reasons, possibly have responded to the work of Deleuze, it is also clear that Deleuze, despite maintaining an interest in Dewey’s pragmatist colleague Charles Peirce, at no point puts on record any evidence of having read or engaged with Dewey’s work. Simply put, the two men carried out their philosophical projects in a manner that prompts the reader to either understand (in Dewey’s case), or else to suppose (in Deleuze’s case), that each was oblivious to the aims and conclusions sought out and stated by the other. Indeed, as one recent commentator puts it rather nicely, the work of each philosopher is divided by time, culture and place (Semetsky 2003, 17).

³ Cf. Cressole, Michel. 1973. *Deleuze*, Paris: Editions universitaires, p.110.

⁴ When remarking on the genesis of *Difference & Repetition*, Deleuze places his work squarely in the anti-Hegelian camp: “All these signs may be attributed to a generalized anti-Hegelianism” *DR*, xix. Cf. *B*, 44, *DR*, 27, 42 – 5 & 269.

But – and there was always going to be a decisive qualification to this view – the benefits of an act of comparison are also quite clear. Deleuze in particular placed great emphasis on the creative aspect involved in an act of comparison, just so long as it is carried out in a critical manner. Thus, in a text we shall go on to consider in greater detail, below, he reformulates the idea of a straightforward comparison into the notion of an *encounter*. When speaking of the significance of an encounter, he declares:

“The encounter between two disciplines doesn't happen when one of them sets about reflecting on the other, but when one realizes that it must resolve for itself and with its own means a problem which is similar to that which is also posed in another. We can concede that similar problems, at diverse moments, in different occasions and conditions, can shake up diverse sciences, and painting, and music, and philosophy, and literature, and cinema. They are the same shudders in quite different terrains. There is no critique except comparative... because any work in a domain is itself auto-comparative.”⁵

Now, Deleuze was talking about the two separate disciplines of cinema and philosophy, and the results that can be achieved through a critical comparison between the two. If, though, like me you agree that the supposedly mutually exclusive traditions of analytic and continental philosophy are no such thing, then it should also prove true that a critical comparison of the work of two philosophers from each tradition might yield conclusions which not only undercut such a superficial distinction, but also discover the potential for creation and innovation which comes from confronting problems similarly stated, though addressed through a differing use of historical and philosophical resources.

⁵ Toubiana, Serge. 1998. ‘The brain is the screen: interview with Gilles Deleuze on the time-image’. *Discourse* 20.3., p. 49.

For that reason what this inquiry is intended to offer is not so much a comparison *per se*, but a reformulation, or reconstruction, perhaps, of John Dewey's philosophical project by way of consideration of the problems and resources offered by Deleuze's own philosophy. This will not be – and is not intended to be – a comprehensive or 'complete' reformulation of Dewey's work, however. Instead, this inquiry focuses primarily on one concept, *temporality*, as it is developed throughout Dewey's work, and will consider the affinities, relations and points of overlap between Dewey's concept of *temporality*, and the corresponding concept of *time* as it is used within Deleuze's work. Because of what I shall argue is the foundational role time and temporality occupy in Dewey's thought – particularly his later work – it will also be necessary for us to re-examine his concept of *experience*, which is, itself, central to the pragmatist project for which Dewey is a central figure. Tracing the relations, and the nature of intervolvements, between the two concepts, *temporality* and *experience*, will provide us with the opportunity to investigate the conditions of possibility required by Dewey's stated idea of experience, and thereby clarify the ontological commitments and assumptions that underlie the very basis of Dewey's mature philosophy, particularly as it holds within his philosophy of education.

Of course, other considerations will arise as this inquiry develops – most particularly in relation to the nature of the relationship between both Dewey and Deleuze's projects, respectively, and the philosophies of Immanuel Kant and Martin Heidegger – but these, too, will only be treated in so far as they are relevant to the central concept, namely temporality as it is found within Dewey's work (cf. Calore 1989, 13).

Orienting the inquiry in this way allows us not only a greater capacity for detailed analysis of a single concept, but also a much greater freedom to pursue the ramifications or lines of thought which arise from such analysis. Accordingly, a brief appraisal of the prevalent interpretations of Dewey's concept of temporality allows us to illustrate this point further: As we shall see in Chapter 4, there has not been a great deal of attention paid to Dewey's idea of temporality, but it can be argued that much of the reflection on that concept has tended to divide into two modes of procedure: (1) defining Dewey's understanding of the concepts of time and temporality, and then tracing the historical development of a concept of temporality over the course of Dewey's career. The results of such a project tend to take form in the division of the evolution of the concept into distinct or separate 'phases' (e.g. Helm 1985); and (2) delineating the relations and effects the development of this concept has for Dewey's employment of other concepts of significance (e.g. 'events' – see Richards 1972; 'experience' and 'nature' – see Helm 1985), as well as for his wider philosophical project (e.g. Mozur 1991).

Substantive as these previous interpretations and scholarly treatments are, what they signally fail to offer is the chief aim of this present inquiry. Succinctly stated, this aim is a consideration of what is, perhaps, the most important aspect of Dewey's concept of temporality: namely, its role and function as a *constructivist* concept, one which has a vital role to play in a wider appraisal of the practice of philosophy *per se* – especially as it is applied in a creative, inventive fashion to the nature of thought, and with it, the very art of living, itself.

Accordingly, following the example of DeLanda's (2004) reconstruction of Deleuze's project – not to mention Deleuze's (1966/97) reconstruction of Bergson's philosophy, or Dewey's (1920) attempt to reconstruct the very endeavor of philosophy itself : if it should be shown that by using the entirely different resources and theoretical materials offered by each author we are enabled to reach the same conclusions, then the force of those very conclusions, though attained according to differing lines of thought and inquiry, must be considerably enhanced. Not only that, but should it occur that Dewey's own conclusions are seemingly validated – indeed, vindicated, perhaps – by agreement with Deleuze – despite the latter having used much more contemporary philosophical and scientific resources to do so – then we might also be entitled to suppose that Dewey's philosophical project, particularly as it proceeds from his concepts of temporality and experience, remains relevant to the concerns and challenges of the present-day. Indeed, if the latter point were granted, we might go on to suggest that Dewey's work may continue to yield the philosophical and pragmatic resources required to successfully meet those very same challenges. And if this should be accepted, then it might also be agreed that there is no field of endeavor more in need of such resources than the field of education as it is currently practiced in the west.

If it should be objected that this project amounts to a treatment of Dewey's philosophy according to externally imposed aims, and in relation to an alien and quite different philosophy, then it ought to be pointed out that Dewey was admirably clear about the *potential* that might be realized by such an encounter. Indeed, when speaking of

potential *per se*, a clearer, more succinct statement of one of the signal purposes of this inquiry cannot be imagined than Dewey's own contention that:

“If we accept the intrinsic connection of time with individuality, [developments] are not the mere redistributions of what existed before... potentiality is a category of existence, for development cannot occur unless an individual has powers or capacities that are not actualized at a given time. But it also means that these powers are not unfolded from within, but are called out through interaction with other things.” (*TI*, 236-7).

As with Dewey, so with us. If we are to take seriously his idea that “potentialities must be thought of in terms of consequences of interactions with other things,” then the potential proffered by Dewey's philosophy can only truly be discerned and realized through its encounter with the thought of another. “Hence”, then, the real potentiality of his work on temporality “cannot be *known* till after... [these] interactions have occurred” (*TI*, 238).”

Chapter 1: Kant and Experience

1.1. Introduction

Kant's views on time (and space) are not difficult to locate in writing. Indeed, they receive a detailed statement throughout several sections the *Critique of Pure Reason*. The fact that individual sections are devoted to them in the opening stages of the Transcendental Aesthetic (Sections II and I for 'time' and 'space,' respectively) attests to their crucial role, not just for Kant's task of 'critical philosophy', but especially with regard to his stated aim of uncovering the conditions which must be presupposed by the nature of human experience. What is more difficult to locate is any large degree of consensus as to how they might be characterized and explicated.⁶ This is in part because, in writing on the nature of time (and space), Kant was deliberately entering into a highly complex and political argument between many of Europe's most prominent thinkers – chief among them Newton (holding an 'absolutist' conception of time) and Leibniz (defending the 'relationalist' conception)⁷ – as to how exactly time and space should be defined, both in ontological terms, and in terms of their status within the emerging science of the early modern period.⁸ It is also, no doubt, because, as we shall see (below), the emerging understanding of time (and temporality) had become beset by conceptual contradictions, divisions, and both logical and definitional 'dead ends'.

⁶ Janiak, Andrew. 2012. "Kant's Views on Space and Time", *The Stanford Encyclopedia of Philosophy* (Winter Edition), edited by Edward N. Zalta. <<http://plato.stanford.edu/archives/win2012/entries/kant-spacetime/>>.

⁷ Cf. Kant's mention of these alternate viewpoints at A23/B37-8, and A39-40/B56-7.

⁸ See *ibid.*, for a more detailed discussion. Cf. also Patricia Kitcher's remarks in the 'Introduction', Kant 1996, page xxv onwards.

Fortunately, however, it is beyond the scope of this dissertation to determine any kind of scholarly consensus on Kant's views on space and time. What is essential to our task in these sections is to lay out his arguments for the central function time plays in relation the conditions of possible experience. In a sense, this section attempts to explicate why and how time extends beyond, or is presupposed by, experience in the broadest sense of the term.

Part I: Kant's concept of time

1.2. The Transcendental Logic: Possible experience

1.2.1. Groundwork: The Metaphysical Exposition

Although Kant wrote about time throughout his career⁹, we shall confine our analysis to the full, mature and most influential statement of his philosophical views on the matter: namely, the text of the *Critique of Pure Reason*. Within that work, the concept of time is repeatedly shown – or at least stated – to play a role which is central to the very conditions required by our common sense of ‘experience’, or ‘undergoing an experience’. Thus, even before explicating a full case for the nature and function of such fundamental transcendental elements as ‘the categories’, or ‘pure concepts’ – without which Kant's very notions of knowledge and cognition could not work – in the Transcendental Logic, Kant uses Part I of the *Critique* to lay out the foundational, or *a priori*, elements of perception which are themselves required for knowledge or cogni-

⁹ For example, this statement, from his *Inaugural Dissertation* (1770), which signals his departure from the Leibnizian concept of *time*, and foreshadows his views as eventually stated in the *CPR*: “Although time, posited in itself and absolutely, is an imaginary entity, it is nonetheless a true concept and a condition of intuitive representation, extending to infinity in all possible objects of the senses, insofar as it concerns the immutable law of the sensible as such” (*Inaugural Dissertation*, §14,6).

tion to become possible.¹⁰ Chief among these elements are time and space, only the former of which will be considered here.

Within Section II of the Transcendental Aesthetic, Kant attempts to lay out a metaphysical exposition of the concept of time. The exposition is supported by five propositions (A30-2), each of which apparently operates as an argument to support the position that time is presupposed by human experience – or, stated in his own terms, that time is (1) an a priori element that (2) underlies all intuitions.¹¹ If this is established, Kant can seemingly move on to his more famous statement on the nature of time: ‘[that] Time is not something that is self-subsistent or that attaches to things as an objective determination, and that hence would remain if one abstracted from all subjective conditions of our intuition of it’ (A33). Instead, time is determined in Kantian terms as ‘a pure form of sensible intuition’ (A32).

The logic of each of the five parts of the metaphysical exposition have been extensively questioned, and in several instances demonstrated not to be able to support the conclusion Kant hopes – *viz*, that time is the formal a priori condition of all appearances generally (A34).¹² Our concern at this stage is not to criticize Kant’s logic, but to understand his argument and his stated conclusion, as these will enable a fuller appreciation of the role time plays in the argument of the ‘metaphysical’ and ‘transcendental’ Aesthetic.

¹⁰ Following Kitcher 1996, ‘Introduction.’

¹¹ Following Allison 1983, p. 82. He goes on to explore how arguments 1-3 support the ‘a priori thesis’; and arguments 4-5 support the ‘intuition thesis.’

¹² E.g. Allison (1983), pp. 86-7.

dental' deductions of the Transcendental Logic. Accordingly, it will suffice, below, to note the structure of his argument, and how it is designed to lead to his conclusion.

The first proposition establishes 'a priority' by denying that time can be an empirical concept 'abstracted' from any experience on the grounds that 'simultaneity' and 'succession' would not then be a feature of perception (A30). Presumably this is because for any such objects to be either 'simultaneous' or successive' is to presuppose that they have already been differentiated within time.¹³ The second proposition establishes a priority by stating that as regards 'appearances in general, we cannot annul time itself, though we can quite readily remove appearances from time' (A31). Again, this seems to show that objects can only be individuated if time is a prior foundation; or, put another way, this means that time thus appears to act as a 'universal' condition which is required if appearances are to be represented. The third proposition is logically related to the second, going on to claim that, it is only on the grounds of such a universal or a priori proposition that we can establish any of the 'apodeictic' principles, or axioms of time which are commonly accepted: that 'time has only one dimension' or that 'different times are not simultaneous but sequential' (A31). Such axioms are held to instruct us prior to experience, not through it.

The final two propositions are designed to show that time is an 'intuition', rather than a 'concept'. For this proof to work, Kant is relying on the distinction he uses throughout his work whereby 'intuitions' are defined as applying to individual things; where-

¹³ Following Guyer, Paul 1998, 2004. "Kant, Immanuel." *Routledge Encyclopedia of Philosophy*, edited by E. Craig. London: Routledge. Retrieved August 27, 2014, from <http://www.rep.routledge.com/article/DB047SECT5> (paragraph 2).

as ‘concepts’ apply only to general classes of things.¹⁴ Thus, proposition four uses the logic of this distinction to point out that, ‘different times are only parts of one and the same time; and the kind of presentation that can be given only through a single object is an intuition’. Similarly, the proposition that ‘different times cannot be simultaneous’ is ‘synthetic, and [therefore] cannot arise from concepts alone. Hence it is contained directly in the intuition... of time’ (A32). The fifth and final proposition reasons that if time is ‘infinite’, then it is also ‘unlimited’; and any such determinate temporal magnitude within it can be presented only via limitations placed upon a single underlying ‘whole’ of time. Because concepts are defined as containing ‘only partial presentations’, however, any such presentation of the unlimited whole cannot be via concepts, and must then be ‘based on direct intuition’ (A32).

1.2.2. Key concept: The Transcendental Exposition and Kant’s ‘Conclusions’

Having traced the key points of the groundwork for Kant’s full statement of his concept of time, we can now analyze at least the structure of the full concept itself. I mention ‘structure’ mainly because much of Kant’s argument for the adequacy of his concept of time relies heavily on the definitions of key terms he uses throughout the First Critique, and so an understanding of his full concept of time can only occur should the definitions and relations between such terms be made explicit. Essentially, we shall here be tracing the broader structure of Kant’s transcendental idealist philosophy.

¹⁴ Agreeing with Guyer, *ibid.* Cf. Kant 1996: “An intuition refers directly to the object and is singular; a concept refers to the object indirectly, by means of the characteristic that may be common to several things” (A320) (cf. A69 & A79).

Also, as with our previous approach, we are not here interested in the full scope of the issues, criticisms or problems associated with Kant's concept of time in the wider scholarly literature. Instead, we are chiefly concerned to find out both how Kant's concept of time constitutes a significant departure from the concept(s) of time found prior to Kant, as well as with what we might suggest that Kant's concept manages to 'achieve.' That is, having achieved such a departure or new statement, what is it that Kant's concept can do for us, for Deleuze, and, most particularly, for Dewey?

For our purposes, we might take this statement as one of several which are adequately representative of Kant's mature statement of the concept of time he holds throughout the *Critique of Pure Reason*. It is worth quoting in full:

“Hence the doctrine we are asserting is that time is *empirically real*, i.e., objectively valid in regard to all objects that might ever be given to our senses. And since our intuition is always sensible, no object that is not subject to the condition of time can ever be given to us in experience. On the other hand, we dispute that time has any claim to absolute reality; i.e., we dispute any claim whereby time would, quite without taking into account the form of our sensible intuition, attach to things absolutely, as a condition or property. Nor indeed can such properties, properties belonging to things in themselves, ever be given to us through the senses. In this, then, consists the *transcendental ideality* of time. According to this view, if we abstract from the subjective conditions of sensible intuition, then time is nothing, and cannot be included among objects in themselves (apart from their relation to our intuition) either as subsisting [as such an object] or as inhering [in one].” (A36/B52-3)

The most obvious need we have if we are to understand the full import of this statement is some kind of workable definition of its key terms, such as 'intuition' and '(the) senses', as well as what Kant might mean by such statements as 'empirically real' and 'transcendentally ideal'. Once these are established, along

with an explication of Kant's full concept of time, we will then be enabled (in the next section) to complete our investigation of what Kant regards as the conditions necessary for experience to be possible, and thereby begin to understand what Kant means when he makes the signal statement 'no object that is not subject to the condition of time can ever be given us in experience'.

With regard to *intuition*: what should be noted is that, so far as the First Critique is concerned, Kant defines it in at least two differing ways.¹⁵ In the Transcendental Aesthetic, Kant states that "In whatever way and by whatever means a cognition may refer to objects, still *intuition* is that by which a cognition refers to objects directly, and at which all thought aims as a means" (A19/B34). Later, in the Transcendental Logic, Kant makes a further statement on intuition - this time within the context of defining 'perception' - that "an intuition refers directly to the object and is singular" (A320/B377). In this way, Kant emphasizes as key to the concept that intuition is both 'immediate' or 'direct' - which is to say, it is *non-conceptual* - and 'singular', with regard to representation (or, following Kant 'the presentation') of objects. That is to say that firstly, intuition is capable of presenting a singular object to mind; and, moreover, that intuition is a key 'enabler' of, or fundamental aspect within, any cognition of an object.¹⁶

¹⁵ Following, e.g. Allison 1983, p. 67, and Wilson 1975, I recognize that there is a longstanding debate concerning the compatibility or otherwise of definitions of 'intuition' throughout Kant's wider scholarship. As elsewhere in this thesis, we are here restricting our inquiry merely to a workable definition for its use within the *Critique of Pure Reason*. See Wilson, Kirk Dallas. 1975. *The Philosophical Quarterly* 25.100: 247-265 for a detailed appraisal of the debate.

¹⁶ Cf. Allison 1983, p. 67, and Kitcher 1996 'Introduction', Section 3.

Furthermore, as is customary with Kant's procedure within the First Critique, *intuition* becomes a concept which bears an internal division, and one closely related to the fundamental division between the a priori and a posteriori which Kant places at the heart of his transcendental idealism. That is, intuition *per se* is held by Kant to exhibit two aspects: the first is that in which we are directly affected by an object via sensation, which is called *empirical intuition* (A20/B34). These, because they are only able to occur subsequent to an encounter with an object, are necessarily given to us solely a posteriori. Empirical intuitions, when given in an appearance, are similarly divided between the a posteriori and a priori aspects. They comprise, at the a posteriori pole, of an undetermined object, with the aspect of that appearance which corresponds to sensation being termed 'matter'; and also, at the a priori pole, a 'manifold', which exhibits certain ordering relations comprising the 'form' of the appearance (*ibid.*). Those presentations referring solely to the ordering relations of the mind - that is, the a priori aspect - or those aspects of the *form* of the appearance alone, are what Kant terms *pure* presentations, on account of having nothing within them that belongs to sensation, or empirical intuition. Being of an a priori nature, the pure form of the presentation must lie already within the mind if the empirical content is to be presented according to the manifold, something which Kant takes to secure the contention that accordingly the *form* of all appearance must be within the mind a priori (A20/B34). The pure, a priori form of sensibility is also termed by Kant *pure intuition*, and is used by him to refer to the manner in which the mind holds the capacity to intuit objects according to the ordering relations and principles of time and space (A22).

At this point, further remarks on the structure in which time is given a central role are needed. For evidence of a further distinction, or division of function, regarded as central to Kant's transcendental idealist project is here required to be brought in. Earlier, in the Introduction to the First Critique, Kant had declared:

“Human cognition has two stems, viz., *sensibility* and *understanding*, which perhaps spring from a common root, though one unknown to us. Through sensibility objects are given to us; through understanding they are thought.” (A15/B29)

Aside from underlining the heterogenous nature of sensibility and understanding, it might be granted that the wording of this statement is designed to emphasize the *passive* nature of sensibility, through which objects are ‘given’ to us¹⁷; and the *active* nature of the understanding, the operation of which affords us the capacity to synthesize the various elements required by cognition such that an object becomes the subject of thought (this will be explored further in the next section, dealing with the two Deductions).

The nature of this distinction and division appears to hold when we consider that, beyond our initial definition of intuition, we have seen Kant declare that ‘all intuition is sensible’ (A36/B52). The terms *sensible*, *sensibility*, and *sensation* are related to this central notion: the subject's capacity to be *affected*. This much becomes clear when

¹⁷ *Contra* e.g. Svare 2006, p. 161.

Kant declares right at the beginning of the Transcendental Aesthetic that ‘The capacity (a receptivity) to acquire presentations as a result of the way in which we are affected by objects is called sensibility’ (A19/B33. Emphasis in the original).¹⁸ Accordingly - and still stated in a way which underlines the *passive* nature the subject of intuition - we are then told ‘the effect of an object on our capacity for presentation, insofar as we are affected by an object, is *sensation*’ (A19-20/B34).¹⁹

This distinction is then further replicated in the contrast Kant draws between what we have come to know as the *empirical reality* of time, and that which also renders it *transcendentally ideal*. We saw, above, that the objects of experience are presented to, or affect us initially - that is, in their empirical form - via sensibility, specifically in the form of an undetermined object, which, as an appearance relating to sensation, we term *matter*. What is crucial here is that the object whose appearance we experience via sensation as *matter*, is not in itself what *we* intuit it as being (A42).

Furthermore, the form of the appearance, experienced by us as a manifold which is ordered according to the a priori relations and principles of the mind, is similarly incapable of presenting to us any aspect of the object *as it is in itself*. The ordering relations of the mind do not, Kant tells us, ‘have the character they appear to have’ (A42). By this I take Kant to mean that, although the a priori ordering relations of the mind are experienced by us as a necessary aspect of any intuition - and as necessary, enable

¹⁸ It is illuminative to compare and contrast Kant’s concept of sensibility with Dewey’s concepts of sensitivity and susceptibility in Chapter 5, sections 5.4 and 5.7, below.

¹⁹ Cf. *ibid.*, p. 161.

the capacity for inter-subjective or objective agreement about appearances - these ordering relations have no such necessity, and, indeed, no direct relation, to objects as they are in themselves. For this reason, the form of the manifold of an object of experience is also, regardless of any idea of objectivity or necessity it may provide, still 'merely' an appearance.

It is at this point that we are finally able to discern something of the *transcendent ideality* of time. Because appearances hold no direct relation to the object in itself, and so yield nothing that can be predicated of objects in themselves, Kant holds that they are thus found only within an intuition. That is to say, appearances cannot exist in themselves, and so must exist *only in us* (the perceiving/intuiting subject) (A42). It follows from this that the way in which they structure our intuition is a central feature of the way in which the subject perceives the world, and is one which is indicative of the conditions which must obtain in the human mind prior to any experience: that is, they are fully indicative of the a priori elements of human intuition or perception.

But appearances themselves cannot complete the conditions of perception, as they often exist simply as the 'content' of a perception. In order that they can be discerned as singular objects, they already exist against a preceding backdrop of space in which they are placed; and in an order of time, wherein we experience in seemingly sequential fashion the different aspects of a manifold of appearance, and the differing thoughts we have in relation to both objects and our experience. It is in this way that time and space, as universal conditions of the possibility of appearances, come to be

called by Kant the ‘pure forms’ of our human sensibility (A42), with space the pure form of outer sense (A34/B50), and time the pure form of inner sense (A33/B49).

Preceding appearances in this way, and operating a formal, determinative structure of perception, time is not simply an a priori element of intuition, or the ground for empirical intuition: as the pure form of inner sense, the formal condition for the manner in which we perceive, intuit, think or judge, time operates as the formal condition for *all* presentations to the mind. It is the formal condition of all inner intuition, and all items of inner intuition are thus subject to the a priori determination of time (A34). Being thus prior to all experience - a priori - and operating as a formal condition of intuition, time is a necessary and universal condition of experience: as such, it is *transcendent*. Similarly, being a feature of the human mind, or that through which the mind structures the intra-subjective, spatio-temporally determined objective reality about which we share knowledge, time exists prior to and separate from reality. It is for this reason that it is *ideal*, rather than real.

1.2.3 A final note about time

Now that we have established the structural framework in which time plays a central role, in preparation for our later analysis we must note this further remark which Kant makes in the Transcendental Logic:

“The mere form of intuition, without substance, is in itself no object, but is the merely formal condition of an object (as appearance) (i.e., it is an *ens imaginarium*) -

as pure space and pure time. These are indeed something, viz., as forms for intuiting, but are not themselves objects which are intuited.” (A291/B347)

With this a further aspect of time’s role as a structural foundation, or substratum, of experience is both revealed and emphasized. As the formal condition of an object, pure time operates as the ground and prior possibility of any thing which appears to us - including the thoughts of inner sense - as well as any empirical intuition which affects us. In this way, time-as-pure-intuition operates as a unifying function, intervening and relating every apprehension within one time, and assigning to every apprehension a relation of (at least) temporal sequence. That is, any and every possible apprehension is given a ‘place in one time’.²⁰

The significance of this cannot be overstated. Within Kant’s transcendental framework, time not only plays a fundamental role in making experience possible; it *is*, itself, the central structure, or substratum, through which experience is not merely made possible, but also ordered and related to every other aspect of human intuition. It thus becomes that which is presupposed by cognition, and the objects of cognition, and also that which structures the objects of intuition and cognition in the way that is peculiar to human sensibility. In this sense, time is not merely transcendental; it is a fundamental factor in the very ontology of human experience.

²⁰ Following Sherover 1969, p. 421.

As such, time is, for Kant, one of the structures which make intra-subjective objectivity possible. As the presupposed ground upon which experience is made possible, and as the transcendental structure which all human experience shares in common, time's unifying capacity is one of the features of transcendental idealism which allows us to speak meaningfully of objects and appearances, even if ultimately the thing-in-itself which lies behind appearances cannot be known to us. The appearances themselves, and the properties of them which can be discerned, being transcendently structured, do not derive from any empirical or sensory ground, but from the way in which our minds interpret the objects of intuition. This mind-dependent structure is universal to human experience, and so, in being a priori, yields the capacity for us to identify the necessary features, laws, rules and repeated patterns of the perceived world, and the occurrences which comprise our experience of it.

It is, then, to the rule-based and formal structures of human thought - the categories, and their role in cognition - that we must now turn if we are to complete our inquiry into the conditions required by Kant for experience to become possible.

Part II. Kant's Concept of Experience

1.3. The 'Metaphysical' and 'Transcendental' Deductions

In what follows, I will first attempt a sympathetic explication of a notoriously tricky part of Kant's First Critique, as we attempt to gain some understanding of (1) what it is that Kant's philosophy attempts to achieve in the name of experience; and (2) why it has proven so influential, even to hostile commentators such as Dewey and Deleuze. In accordance with these aims, where necessary, I shall employ interpreta-

tions put forward by critics who attempt to secure Kant's argument on viable grounds - that is, widely accepted, 'orthodox' interpretations - most notably those put forward by Henry Allison (1983). In the next section, we shall go on to consider the logical grounds of Kant's argument in a more critical fashion.

In his consideration of the nature of both human experience and knowledge within the *Critique of Pure Reason*, Kant was led to postulate the existence of 'pure concepts of the understanding'²¹, or *Categories*. These were held to be of an *a priori* nature: that is, they are used in a manner wholly independent of all experience. Kant assigned such categories a fundamental role within cognition, asserting that 'nothing is possible as object of experience unless these concepts are presupposed' (B126). In this way, the categories were stipulated to possess (at least) objective validity²², in that they exist as the conditions necessary for the cognition of an object. There is a case for saying that, further to the latter assertion, Kant was also concerned to demonstrate the objective reality²³ of the categories, this being because they are necessary for the cognition of an object of experience (an actual object existing in a spatio-temporal reality). As a consequence of the manifest importance of the categories for human cognition, Kant deemed it necessary to provide a deduction of the function of the categories. The attempt to provide such a deduction was divided: in the so-called *Metaphysical Deduc-*

²¹ A shortened version of the title 'pure concept of the understanding', used by Kant to denote those concepts which 'express a fundamental law or function of the understanding.' See Allison 1983, p. 116.

²² Cf. "And if we can prove that only by means of the categories can an object be thought, this will already suffice as a deduction of them and as a justification of their objective validity" (*italics mine*). Consult A96-7.

²³ I cite the final sentences of A95 as proof for this reading. An argument to this effect is also advanced by Allison 1983.

tion, or *Guide*, Kant sought to demonstrate the existence of the categories in their capacity to provide *a priori* rules for the thought of an object; in the *Transcendental Deduction*, he endeavored to establish proof of the necessity of the categories for both sensible, and intellectual, experience. Both arguments were designed to comprise of a complete and sufficient deduction of the categories.

For the purposes of this dissertation, I shall confine my analysis to the parts fundamental to the proof of each deduction before discussing whether or not Kant can be said to have achieved his stated aim.

The *a priori* nature of the categories is first suggested through consideration of the possible cases wherein synthetic presentation and its objects can concur. It becomes apparent that if – as is the case in the first possibility – the object makes possible the presentation, then the concurrence is of an empirical nature. If this should obtain for human cognition in its entirety, then we should be incapable, *contra* any skeptical argument, of asserting the validity of such apparent laws as cause and effect; indeed, we should have to render any apparent regularity amongst appearances at least the product of chance, at worst a mere chimera. Rules derived from experience can enjoy only comparative universality: it is impossible that they should hold necessarily. Yet there is an alternative theory for the concurrence of object and presentation: it could obtain that the presentation should be ‘*a priori* determinative in regard to the object if cognizing something as an object is possible only through it’ (B125). It is the latter explanation that Kant seeks to endorse, and which lies at the center of the critical project underlying his transcendental idealist philosophy.

Kant had detailed earlier in the *Critique* the components necessary for successful cognition. The initial element required is a ‘manifold’ of pure intuition, which must then be subject to a ‘pure synthesis’ performed by the imagination; the final element consists of unity, engendered through the subsumption of the synthesis under a concept resting in the understanding (A79). The unification is achieved by a concept as a consequence of its *analytical* nature, a nature that enables a concept to unite under one representation a series of features characteristic of a diversity of objects (cf. Cf. Allison 1983, 125.). Such unificatory powers cause concepts to exist as a fundamental part of that which is the function of unity among our presentations: namely, judgments (A69).

Kant goes on to assert that in addition to providing unity to presentations within a judgment, concepts also unify the mere synthesis of presentations within intuitions. Through the same analytic unity which unifies within judgments, concepts are able to bring about a ‘synthetic unity of the manifold in intuition’ (B105). That is, concepts impose a determinative order on the manifold of intuition, creating an object (*objekt*)²⁴, or what might be broadly defined as ‘a subject for judgment’. In this way, concepts exist as rule-providers for the determination of an object, there arising ‘as many pure concepts of understanding applying a priori to objects of intuition as such, as ... there were logical functions involved in all possible judgments’ (B105). Concepts are thus essential parts of Kant's attempt to illustrate a theory of cognition in

²⁴ Consult Allison (1983) p. 135 for a clarification of the two senses of object used by Kant.

which subjective conditions of thought could yield conditions for the possibility of all cognition of objects.

If we accept these claims – the explicit argument of the Metaphysical Deduction – then Kant envisages that we must concede that he has at least provided a firm basis for the *logical* proof of the objective validity of the categories. For it is apparent that he has so far established that the pure concepts supply *a priori* the categorial rules for the thought of an object. But it should be remembered that at this point in the argument, Kant has succeeded only in proving the fact that the categories apply to an object in the general sense of the word (*objekt*); as yet, there is no proof that the categories have reference to the *spatio-temporal conditions of human experience*. In order to assess the success of this latter proof, we must examine the second of the two Deductions, before providing a more detailed explication of the Kantian concept of *time's* role as a condition of possible experience.

1.3.1 The Transcendental Deduction

The Transcendental Deduction of the Second Edition²⁵ is divided into two parts: the first of these (§§15-21) is concerned to demonstrate that the categories are necessary to the cognition of objects of sensible intuition in general; the second part (§§24-6) seeks to demonstrate that the categories must be presupposed if cognition of the actual distinct objects of human sensibility is to be achieved.²⁶ Although there are other interpretations of the two parts of the Transcendental Deduction, I consider this reading

²⁵ Restricting my analysis solely to the Second Edition.

²⁶ Following Allison 1983, p. 133.

the most favorable, not least because it is compatible with my earlier assertion that Kant sought to establish the objective reality of the categories *as well* as their objective validity. There is also the stress laid on discussions of objective validity evident in Sections 17 (B137), 18 (see B140), and 19 (see B142); and also – in relation to the second part of the Transcendental Deduction – the reference to the unity prescribed by the category ‘to the manifold of a given intuition as such’ (B145). Further reasons for this interpretation may be revealed as our examination proceeds.

The most significant aspect of the first part of the Transcendental Deduction is the asserted link between the transcendental unity of apperception, and the representation of objects.²⁷ This much is shown by Kant's assertion that: “... the reference of presentations to an object consists solely in this unity of consciousness, and hence so does their objective validity” (B137). In postulating such a link, Kant was seeking to develop and consolidate the findings of the Metaphysical Deduction, in which it was demonstrated that the categories existed as rule-providers for the determination of an object; that is, Kant was concerned to illustrate fully the objective validity of the categories. But instead of a mere repetition of the argument of the Metaphysical Deduction, a new element is added: for Section 17 is concerned to establish a reciprocal relation between the presentation of objects and the transcendental unity of apperception.²⁸

²⁷ A similar point is made by Allison 1983, p. 144.

²⁸ A point developed by Allison 1983, pp. 144 -5.

In asserting that ‘all unification of presentations requires that there be unity of consciousness in the synthesis of them’ (B137), Kant is illustrating the necessity of unity of consciousness for the representation of an *object*.²⁹ Such an assertion is seemingly warranted on the strength of Kant's theory of apperception. Yet, given the nature of his claims concerning the fundamental status of the categories within human cognition, Kant must also establish the inverse of the above assertion; that is, he must also demonstrate that there is an object represented whenever there is unity of consciousness. If we consider that apperception is only possible through the unification of diverse representations in the thought of the ‘I think’; and if we remember that such unification can occur only via the employment of a concept; then, according to the definition of an object given at B137, the unified representations subsumed under the aforementioned concept must constitute the representation of an object. It follows from this that the representation of an object exists as a necessary condition for the unity of consciousness; and in this way a reciprocal relation has been established between the presentation of objects and the unity of apperception (Allison 1983, 145-6).

The purpose of such a relation only becomes manifest in the succeeding paragraph.

There, Kant declares that:

“The synthetic unity of consciousness is, therefore, an objective condition of all cognition. Not only do I myself need this condition in order to cognize an ob-

²⁹ Cf. the previous sentence of B137: ‘an *object* is that in whose concept the manifold of a given intuition is united.’

ject, but every intuition must be subject to it in order to become an object for me.” (B138)

In this statement the objectively valid nature of apperception is made clear, it existing as the fundamental ground on which representation of an object is possible. Given that ‘synthetic unity’ is a function of the understanding that occurs under a judgment, it follows that the manifold, if it is to become an object for a unified consciousness, must be subsumed under a category (as was established in the Metaphysical Deduction). This conclusion completes Kant’s deduction of the objective validity of the categories.

1.3.2. Time as a condition of possible experience

Despite the coherency of Kant’s proof of the objective validity of the categories, however, it does not constitute a demonstration of the ability of the categories to provide knowledge of the actual, *spatio-temporal* objects of human experience. Such a demonstration would amount to proof of the objective reality of the categories, a task attempted in the final part of the Transcendental Deduction. The fundamental element of this proof consists of Kant’s attempt to establish that empirical synthesis – termed the *synthesis of apprehension* – is governed by the categories.

Kant begins this attempt by noting that any content given in space and time must be subject to the same method of synthesis that operates on space and time themselves (in their capacity as forms of intuition). Commentators suggest that Kant assumes such unification to be performed by the transcendental synthesis of the

imagination³⁰, rather than a concept of the understanding, as ‘the unity of the *a priori* intuition belongs to space and time, and not to the concept of the understanding’ (B161, fn. 305). Given that Kant held that the imagination is required for the successful representation of time and space, the former conclusion appears valid. Kant moves from this consideration to state that, because the synthesis of apprehension is determined by space and time, it must therefore be subject to the transcendental synthesis of the imagination. We are then told that such a synthesis is the result of the same method of combination as is required for an object to be presented to apperception, yet in this case applied to objects of human sensibility. Given that any combination of intuition in general, in order to become an object for apperception, must be subsumed under a category, this appears to license the claim that the synthesis of imagination – and hence the synthesis of apprehension – must conform to the categories also. Yet despite the obvious importance of this claim in his attempt to link the categories with objects of human sensibility, Kant provides no argument as proof. Regardless of this, Kant goes on to conclude that all synthesis – including that which renders possible perception itself³¹ – is subject to the categories. If such a conclusion is warranted, the foregoing argument has succeeded in deducing the objective reality of the categories.

Although Kant offers no explicit argument in support of his connection of the categories with the synthesis of imagination, commentators (e.g. Allison 1983) have been able to discern one implicit within his theory. For if we accept the conclusion of the

³⁰ Allison 1983 in particular, p. 165.

³¹ Defined as ‘empirical consciousness of the manifold’ (B160).

first part of the Transcendental Deduction, it must be the case that any synthesis engendered by the imagination must be subject to the conditions of the unity of apperception. If we consider even the common notion of *time*, unless the latter were the case, we should be unable to represent it as one single whole, encompassing different time periods; *this would amount to a denial of the existence of human experience* (a single consciousness would be unable simultaneously to unite successive, or different, time-states, thereby rendering impossible the possibility of coherent human experience). Because we are thus able to infer the unity of apperception from the evident unity of time, a connection between the categories (the conditions for the unity of apperception), and the transcendental synthesis of the imagination (that which unifies time) has been established. In this way Kant has deduced the objective reality of the categories through the demonstration of their necessary role in all synthesis.³²

From the above we are entitled to (1) allow that Kant has at least succeeded in proving the objective validity of the categories according to his own terms; and (2) understand the central role *time* plays in securing this key tenet of Kant's transcendental idealist project. In this way he has achieved the task explicit within the Metaphysical Deduction and the first part of the Transcendental Deduction. Further, it is also the case that one of the chief arguments of the Transcendental Deduction – that concerned to demonstrate the necessity of the categories for empirical cognition – has been proven valid. But if we consider the purpose of the Transcendental Deduction as a whole, we find that Kant sought also to illustrate claim that the categories make *expe-*

³² Argument made by Allison (1983), p. 162, and pp. 166-7.

rience possible. Although a full consideration of the latter assertion moves us beyond the strict scope of this enquiry as to the role of time as a condition of possible experience, in the light of its existence we must modify the conclusion that a deduction of the objective reality of the categories has been provided. Consequently, given the success of his argument for the necessity of the categories for empirical cognition, we can allow that Kant has deduced the objective reality of the categories in the weak sense of the term; whether or not the categories possess objective reality in the strong sense is a conclusion which must be deferred beyond this thesis to an examination of the final argument presented in the Transcendental Deduction.

Chapter 2: Heidegger and the emergence of temporality as a discrete concept

2.1. A brief history of the confusion surrounding time

The overt history of mankind's attempt to think through the idea of time is an exercise in the production of confusion. Despite being, perhaps, one of the most tangible aspects of our immediate experience, with few notable exceptions (e.g. Bergson 1910; Heidegger 1962/1927; Deleuze 1966/97, 1968/97, 1985/2000), our inquiry into the nature and function of time has, following the Kantian example explored in Chapter 1, tended to focus primarily on the coherence of the conceptual apparatus used to investigate the phenomenon – often at the expense of this inquiry's adequacy to experience.³³ Despite this privileging of coherence, however, the confusion has persisted on many levels; from confusion amongst the many stated findings throughout the history of thought³⁴ ; to confusion, at the very inception of reflection on the matter, between the observable effects (change and motion, for example) held to provide evidence of time, and the concept of time *simpliciter* (Turetzky 1998, 5; Sherover 2003, 9). That time is an idea we treat, even today, with an unreflective familiarity and insouciance is little merited by our documented understanding of the concept.

2.2. The relation between time and temporality in physics and philosophy

In order to discern the viability of my putative thesis, it will first be necessary to address in brief form the nature of the traditional relation, and the attendant confusion, between the concepts of time and temporality.

³³ One of the key objections to Kant's philosophic method advanced by Dewey. This will be explored further in Chapter 5, Section 1, below.

³⁴ A history of documents which, finding its earliest example in Anaximander of Miletus, thereby coincides exactly with the written tradition of western philosophy (Turetzky 1998, 6).

As shown, above (Section 1), a sense of confusion surrounds our understanding of the concept or idea of time. That this sense of confusion results from an obsession with logical coherence is nowhere more evident than in the point of division which was, until recently, perceived to be axiomatic to the current debate on time. This divide is commonly held to exist between the varying concepts of time developed within individual scientific disciplines, and the conception(s) of time generally associated with the experience of it within the diurnal or ‘everyday’ (Sandbothe 2001, 1), a domain of inquiry and description which has been covered largely by thinkers within the disciplines of philosophy and psychology, and, by extension, education. Traditionally rendered, the division contradistinguishes between the domains of so-called *natural* time – that is, quantitative (‘objective’) time, or that conceived at the level of material change – and *historical* time – that is, qualitatively-felt (‘subjective’) time, or that conceived from the perspective of the human individual (Sherover 2003, 15). The effects of this differentiation can be found most obviously perhaps in the contradictions that arose between both the project and content of physical and philosophical theories of time characteristic of the beginning years of the twentieth century (Sandboth 2001, 2; cf. Wallace 2013, 277 & Calore 1989, 16-17). Thus we find commentators noting with regard to time conceived within the field of physics that its leading proponents (such as Einstein) were tempted to entertain the non-existence of time and history, whilst in the field of philosophy thinkers such as Husserl, Bergson and Heidegger were constructing work whose theses were premised on the fundamental importance of time and duration for the basis of human/Dasein’s experience (of Being) (Prigogine and Pahaut 1985, 26; Cited in Sandbothe 2001, 2).

To further complicate matters, the form of this division between natural or mathematical and historical or human time has, following both Descartes' treatment of it, and Kant's consolidation of its explanatory value (Sherover 2003, 16), also been uncritically accepted as axiomatic for many within the field of philosophy itself (Sherover 2003, 15; Derrida 1982, 63; Wood 1989, 1-2). Even a cursory glance at the history of the philosophy of time identifies the widespread recurrence of this bifurcation in varying forms (Sherover 2003, 14-15), each instantiation of which derives in some manner from a qualitative distinction between aspects of time considered from the viewpoint of personal reflection (e.g. Locke 1894, 245-6; McTaggart 1908, 'A-series'), and a more abstracted viewpoint which tends to focus on the bare *process* of time, generally reducing it to the systematic measurement of either change (e.g. Aristotle, *Physics IV*, chapters 10-14) or motion, or else the medium by which entities exhibit some kind of relation to a rational or ordering principle (e.g. Plato *Timaeus*; McTaggart 1908, 'B-series'). Indeed, of perhaps the three most influential traditions of philosophical time analysis within the twentieth century³⁵, each can be shown to have instituted some

³⁵ According to Turetzky, these are the traditions which arise from (1) the analytic consideration of McTaggart's outline and treatment of the problem; (2) the phenomenological tradition arising from the work of Husserl; and (3) the distaff tradition which, focusing on Bergson's work, 'critically develops the problems of temporal synthesis and the generation of novelty'... (Turetzky, 1998, 117-18).

form of this division as the basis for a central set of problems to which they purport to provide answers (Turetzky 1998, 117-18).³⁶

What is genuinely problematic, here, is not so much the plethora of differing conceptions of time, but the apparently irreducible nature of the distinction between the two aspects of time – whether conceived in the form of natural against historical time, static time against dynamic time (Turetzky 1998, 117), or Newton’s absolute, true mathematical time against relative, apparent, common time (*ibid.*, 73).

For, considered in isolation from one another, the conception of each temporal aspect, of whatever form, is open to a series of risks. One primary concern is that the conception of the temporal aspect may become reified, a process which, however useful for enabling quick comprehension of the matter, renders it inadequately informative in relation to experience. A failure to exhibit a demonstrable relation to the empirical and existential processes of actualization runs the further risk of reducing the temporal aspect to a mere function of theoretical soundness, wherein its explanatory value relates solely to its function within the scheme of a theoretical statement, irrespective of whether it has any viable relation to experience.

³⁶ Thus: “These traditions focus on different problems and relate to one another only tangentially at certain points. Beginning with McTaggart’s problem, analytic philosophy critically develops the contrast between static time and temporal becoming. Beginning with Husserl, phenomenology critically develops problems concerning temporal appearances and their unification. Beginning with Bergson, the distaff tradition critically develops the problems of temporal synthesis and the generation of novelty. However, the phenomenological tradition acknowledges and incorporates the aspects of time studies by the analytic tradition, and the distaff tradition acknowledges and incorporates the aspects of time studied by the phenomenological tradition and thereby the analytic tradition.”

A second, related, concern is that the specific way in which an aspect of temporality is formulated as a *concept* (as ‘A-series time’, say), on the one hand; and its *actual* employment within theoretical statements (in McTaggart’s argument for the unreality of time, for example), on the other, exposes that conception of an aspect of temporality to a degree of rejection which is illegitimate in its scope. It is often the case with theories of time that, regardless of the discipline considered, a successful critique or refutation of either the formulation, or deployment of a concept is considered sufficient for its unviability to be demonstrated, thereby curtailing or removing entirely its perceived use-value as a tool of inquiry. The fact that, more often than not, the reasoning used to discredit conceptual formulations is based upon a prior and uncritical acceptance of the antinomies and classifications whose logic is in question leads to an unwarranted emphasis on the preservation of theoretical consistency – usually at the expense of innovative and productive investigation of experience.

The third concern relates to the recurring need for a distinction between *time* as it relates to the physical universe, on the one hand, and to mankind, on the other.³⁷ For, beyond even the work of philosophers such as Husserl, Bergson, Heidegger and Dewey, recent scholarship in the history of physics has highlighted several effects in the wake of the establishment of thermodynamics as a theoretical framework that have crucial ramifications for the conception of time within the sciences. According to Sandbothe,

³⁷ A division which, as Calore notes, Dewey considers ‘untenable’ (Calore 1989, 16-17).

“From the attempt to operationalize complex thermodynamic systems with the means of physical formalization, the necessity resulted in physics to supplement the reversible time concept underlying classical mechanics with modified time concepts that imply in various ways the irreversibility of a time directed from the past into the future. The transition thus expressed from a Newtonian worldview, one oriented towards universality and uniformity, to a science operating with plural models of the construction of physical objects had already been highlighted by Comte...” (Sandbothe 2001, 59).

With the introduction of the thesis of the irreversibility of time within the framework of physics, elements of the scientific understanding of time thereby exhibit features much more closely related to those of the qualitative kind on which our ‘everyday’ notion of time is based. Similarly, a close examination of the behavior of systems of complex bifurcation achieves two related consequences of note: (1) it helps to translate examples of physical functioning from the purely mathematical, quantitative conception of temporality. It achieves this by demonstrating that systems of complex bifurcations proceeding beyond ‘primary bifurcation’, when moved further from equilibrium through interaction with the environment, “pass through zones of instability towards certain fluctuations.” That is to say, by passing through such unstable zones, complex bifurcations in effect result in an ‘historical’ evolutionary path in which “fluctuations ‘decide’ which working regime the system will subsequently find itself in” (Prigogine and Stengers, 1985. Cited in Sandbothe 2001, 58). Related to this, the second consequence holds: (2), the emergence of unique historical paths, punctuated by non-determinable moments of ‘decision’, place these systems fully within the domain of historical time previously regarded as both unique to reflective human subjects, and antithetical to the natural concept of time traditionally reserved for processes of material change.

2.3. Heidegger: The emergence of temporality as a discrete concept

Yet, despite the foregoing account of the confusion that attaches to time throughout history, at least as concerns the *philosophical* understanding of time³⁸, the conceptual means by which to clarify much of this confusion already exists. Work by, for example, Martin Heidegger (1962/1927, 1992/1925) within the field of phenomenology has demonstrated the value in clarifying the relationship between the qualitative, experiential dimension of time commonly denoted by the term *temporality*, and *time* considered in a more abstract conceptual manner, with its corresponding emphasis on the universal nature of the *process* in which change is remarked and measured. This latter approach, traditionally conceived, is the one held to be hegemonic within the sciences. According to the traditional terms of this distinction, ‘temporality’ obtains merely as a derivative of time, and as a concept whose scope of reference is limited solely to the sphere of human experience. ‘Time’, correspondingly, operates as the foundational term, specifically as the objective and universal concept by which process and change are measured throughout the Universe. Heidegger reverses this priority thus:

“Dasein is my specificity...Dasein is time, time is temporal. Dasein is not time but temporality. The fundamental assertion that time is temporal is therefore the most authentic determination – and it is not a tautology, because the Being of temporality signifies non-identical actuality. Dasein is its past, it is its possibility in running ahead of this past. In this running I am authentically time, I have time. In so far as time is in each case mine, there are many times. 'Time itself is meaningless; time is temporal.'” (Heidegger 1992, 20-21E.)

³⁸ As opposed to what might broadly be called the *traditional scientific* viewpoint. As we shall see, however, this traditional distinction, particularly in the wake of recent work in the history of physics by Prigogine and Stengers, is no longer adequate (cf. Sandbothe 2001, 58). Indeed, as our consideration of the work of Mike Sandbothe shall show, the current theory within the field of thermodynamics renders the conception of time within areas of physics fully compatible with the work of philosophers such as Heidegger.

By referring directly to Dasein's past, and the 'running ahead of this past', Heidegger reminds us of the tri-partite structure of time: that is, time as containing the separable dimensions of past, present and future. While the 'everyday' or 'ordinary' concept of time is premised on a series of sequential now-points – thereby privileging the dimension of the present 'moment of presence' over the seemingly 'finished' and thus 'absent' dimension of the past, and the not-yet real (and thus absent, ineffective) dimension of the future – 'primordial' or authentic time (i.e. temporality) replaces this focus on the way in which each of the three dimensions of time in actuality 'reaches throughout' the entire structure of Dasein. Accordingly, once it is recognized that temporality reaches throughout the structure of Dasein, it is but a short step for us to realize that each of the three dimensions of temporality, though having their own demonstrable quality or character, must nonetheless demonstrate a reciprocal unity

It is only thus that Heidegger can claim "time constitutes the metaphysical continuity of Dasein."³⁹ To understand this claim more fully, and to finally establish how it is that temporality can reach throughout the structure of Dasein, requires a brief explication of Heidegger's concept of *being-in-the-world*, as well as its related - indeed, we might better say 'interrelated', if we are to honor the structure of Heidegger's work - concepts, *care* and *concern*.

³⁹ Heidegger, M. 1984. *The Metaphysical Foundations of Logic*, trans. Michael Heim (Bloomington: Indiana University Press), p. 198. Cited in Rosenthal, Sandra B. 2000. *Time, Continuity and Indeterminacy: A Pragmatic Engagement with Contemporary Perspectives*. Albany: State University of New York Press, p. 49.

2.4. Time and experience in Heidegger: ‘Care’ and ‘concern’

Before we proceed to a full analysis of *being-in-the-world*, it is important - especially in light of our concern with temporality as it features in the educational sphere - to first consider the significance attached to the ‘everyday’ manifestation of *being-in-the-world*, namely (the comportment) ‘care’, along with its related *existential* ‘concern.’ The kind of comportment Heidegger designates as *care* is especially important in view of our stated project of considering the preconditions for experience, as it is with the modes of *care* and *concern* in particular that we begin to understand how ‘experience’ is structured for Dasein, and thus come to appreciate the full role temporality plays in the structure of experience.

The significance of both *care* and *concern* for any understanding of *being-in-the-world* is made apparent in Section 28 of *Being and Time* when Heidegger declares that:

“...[W]e must turn our Interpretation back to the phenomenon of Being-in. By considering this more penetratingly, however, we shall not only get a new and surer phenomenological view of the structural totality of Being-in-the-world, but shall also pave the way to grasping the primordial Being of Dasein itself – namely, care” (*BT*, 169/H131).

By returning attention once again to Being-in, and especially its aspect of care, Heidegger brings to mind his earlier summation of the importance of this compound expression: “‘Being-in’ is thus the formal existential expression for the Being of Dasein,

which has Being-in-the-world as its essential state” (*BT*, 80/H54). Characterized earlier in the same passage as an *existentiale*, what Heidegger seeks to highlight is that Being-in is an irreducible, necessary and structured mode through which an individual can be considered to realize its specific sense of the verb (to) *exist*. That is, without having an identifiable state of Being which renders us predisposed to locate the sense and expression of our existence in the world in which we already reside, Dasein could not be said to have a relationship with Being which can be distinguished from that of categorial entities, *viz.* those inanimate objects which we commonly designate a ‘Thing’ (*BT*, 80-81/H54-55). It will be important, then, for our full understanding of the significance of Being-in-the-world to illustrate this specific sense of Being-in with reference to Heidegger’s exploration of the ‘everyday’ manner of Being-in-the-world, particularly as it relates to the further *existentiale* of *concern*.

In terms of satisfying the purpose of his phenomenological inquiry, Heidegger’s analysis of our ‘everyday’ mode of approaching the world (comportment) can be considered paradigmatic. Premised on the distinction between *Vorhanden* (theoretical entities) and *Zuhanden* (tool-like beings), Heidegger proceeds to elaborate the differences between the detached, theoretical approach to understanding the world – as epitomized in the Cartesian worldview upon which he considers the current Western-scientific stance is based – and the pre-theoretical and engaged mode of everyday living in which we find ourselves already embedded within a meaningful world of entities and relations. Characterizing *Vorhanden* as that mode in which objects are viewed as ‘present-to-hand,’ Heidegger points out that the assumption of such a mode, rather than the providing the foundation of analytical knowledge from which we can come

to 'know' entities in the essence of their nature, is in fact derivative of the prior mode of engaging entities as *Zuhanden*, or 'ready-to-hand.'⁴⁰ This is because an entity comes to exhibit sense or meaning for Dasein only when it assumes the character of 'equipment' by way of being subsumed within a network of assignment or reference. Such a network comprises of a totality of equipment-like entities (a pen, for example, alongside pieces of paper, a desk, and so on) which exhibit their nature (being) courtesy of being approached (via circumspection) in terms of uses structured according to an overarching end goal, to be achieved 'for the sake of a possibility of Dasein's Being'⁴¹ (e.g. communication, something which can be achieved by using a pen to produce writing on a page of paper). Any totality's primary sense derives from its ability to achieve, through assignment of a sense of 'in-order-to' to various related entities, certain projected outcomes (that 'towards which' we work) necessary to allow Dasein to bring about or maintain a desired or desirable end state (the aforementioned 'possibility' of its Being). This end state is not necessarily one which we represent to ourselves: in fact, the 'equipment structure' is not known to us when using it (*BT*, 98/H69). Instead, its projection arises as an irreducible component of our *concernful* dealings with the world of beings (*BT*, 95-102/H67-73).

It is with the mention of *concern* that we can begin to discern the importance of Heidegger's analysis of the everyday world for our overarching understanding of experience, and the preconditions - especially those which relate to *temporality* - which make it possible. For a *concernful* dealing with beings implies the projection of cer-

⁴⁰ See Ratcliffe 2002, pp 288-9 for a full account.

⁴¹ *BT*, 116/H84.

tain possibilities onto beings, or what we might, in another, more loaded sense, consider an act of *interpretation*. Indeed, Heidegger is explicit about this, stating:

“In contrast to... colloquial ontical significations, the expression ‘concern’ will be used in this investigation as an ontological term for an *existentiale*, and will designate the Being of a possible way of Being-in-the-world. This term has been chosen not because Dasein happens to be proximally and to a large extent ‘practical’ and economic, but because the Being of Dasein itself is to be made visible as *care*. This expression too is to be taken as an ontological structural concept... It has nothing to do with ‘tribulation’, ‘melancholy’, or the ‘cares of life’... These... are ontically possible only because Dasein, when understood *ontologically*, is care. Because Being-in-the-world belongs essentially to Dasein, its Being towards the world is essentially concern.” (BT, 83-84/H57)

Concern, then, has a fundamental relationship with the *facticity* of Dasein, or those facts, limitations (physical, mental, situational, biological, and so on), circumstances, capabilities, ideological structures and the like⁴², deriving from the past, which combine to *co-implicate* a ‘definite way of Being [*Seinsbestimmtheit*]’ (BT, 82/H56) in relation to any particular Dasein. In so doing, *concern* comes to relate those features of Dasein which are anchored in the past to the act of *projection*, or that by which Dasein both relates itself to, and structures, its future possibilities. It is, in this way, a fundamentally teleological mode of orientation which pertains primarily to Dasein’s activities within the world, and is the modality through which an individual directs itself into the future by way of the tasks of discerning and realizing possibilities for itself as they might be expressed through projection of these possibilities onto the world. And yet *concern* is ultimately a variation of the stated primordial mode of Dasein’s being, namely, *care*: that mode in which Dasein, in expressing anything about

⁴² Often designated by or involved with Heidegger’s notion of *thrownness*.

itself, performs a fundamental act of projection mediated by self-relation. It is thus that “no sooner has Dasein expressed anything about itself to itself, than it has already interpreted itself as *care (cura)*, even though it has done so only pre-ontologically” (*BT*, 27/H183). *Care*, and its world-oriented modulation *concern*, thus become the primary form of expression for a pre-cognitive orientation of experience such that it reflects the teleology peculiar to an individual Dasein.

The crucial point we derive from this is the following: the teleology – the ‘in-order-to,’ or ‘towards-which,’ and so on – according to which is conducted any ‘involvement’ with the world – *all these must be disclosed beforehand with a certain intelligibility* (*BT*, 119/H86). Thus, just as we shall see with Dewey’s reformulated version of the Reflex Arc coordination (Chapter 4, Section 7, below), any act of understanding in this sense is irreducibly temporal in nature, as it must have seized upon a tacit or explicit sense of potentiality for Dasein, and allowed itself to become involved with the entities of its world in the light of this interpretation of potentiality. In Heidegger’s words: “*The ‘wherein’ of an act of understanding which assigns or refers itself, is that for which one lets entities be encountered in the kind of Being that belongs to involvements; and this ‘wherein’ is the phenomenon of the world*” (*ibid.*).

2.5. The temporal underpinnings of ‘*Being-in-the-world*’

Within the ontological investigation contained in *Being and Time*, the concept of Being-in-the-world is so fundamental that Heidegger was led to declare that the character(s) of Dasein’s Being ‘must be seen and understood *a priori* as grounded upon that state of Being which we have-called “Being-in-the-world”’ (*BT*, 78). Such a concept

sought to further the contention that the nature of Being has been obfuscated as a consequence of the prevalence of the 'scientific' attitude - and its related treatment of time and temporality - towards the world and its entities; an attitude that, since its clearest exposition in the writings of Descartes, has found nothing but consolidation in its position as the paradigmatic attitude of the Western world. The notion of Being-in-the-world represents Heidegger's attempt to avoid such confusion, through his formulation of a description of the world which is at once both fundamental, and phenomenological: that is, a description presupposed by any other, but one that also succeeds in identifying the nature of the world as it is apprehended by Dasein. And the nature of that world is, as we shall see, one which is thoroughly temporal.

As noted above, our fundamental and proximal engagement with the world does not occur through perceptual cognition, but through a 'kind of *concern* which manipulates things and puts them to use' (*BT*, 95). This state of affairs arises because although Dasein is 'thrown' into a particular socio-historical context which partly constitutes its 'facticity', it is different from a present-at-hand entity such as a piece of wax; instead of existing 'in' three-dimensional space, Dasein 'dwells alongside' a world in which it is 'absorbed', the context and surroundings of the world perpetually affecting and informing that which is an 'issue' for Dasein: namely, its own Being (*BT*, 67-8). It is because the environment (*Umwelt*) affects Dasein's Being – and the projects inherent within Being – that we come to regard the world proximally with 'concern' (*besorgen*), an *existential* that prompts us to manipulate the environment in the manner of equipment (*BT*, 97) to be utilized in pursuit of our own ends. As we saw, above, objects thus are discovered proximally as 'ready-to-hand', as entities intelligible only as

they pertain to our human purposes (entities which have an 'in-order-to'). Any other way of accessing the world is the result of an *existentiale* which presupposes one in which the environment is yielded as being equipmental and 'ready-to-hand'.

The disclosure of the Being of entities found in our environment is achieved, as noted earlier, via the subsumption of objects as things 'in-order-to'. Because Dasein considers its Being an *issue*, the various possibilities (each possibility Heidegger terms a 'for-the-sake-of-which') of that Being become involved with Dasein's *understanding*; such understanding interprets the environment in the light of Dasein's possibilities, with the successful interpretation of an object as an 'in-order-to' imbuing that entity with 'meaning', or relevance. In this manner an object obtains a *reference*, in that it becomes integrated into a sphere of meaning; its relevance refers ultimately – perhaps via a function subservient to that possibility (a 'towards-which') (*BT*, 99) – to the possibility of Dasein's Being for which it is an 'in-order-to'. Any hierarchy of reference which becomes involved in a 'for-the-sake-of-which' exists as a *referential totality*; it is an integrated set of referential totalities which constitute Dasein's world.⁴³ Because the understanding enjoys familiarity with the relations within, and between these totalities, they become *assigned* to it, and the possibilities of Dasein's Being with which it is concerned. Once the understanding has involved these relationships in assignment, they become 'bound to one another as a primordial totality'; they exist in a rela-

⁴³ I am using world here in the third of four senses Heidegger attaches to the word: namely, as "that 'wherein' a factual Dasein as such can be said to 'live'." Not to be confused with "world", which Heidegger defines as 'the totality of those entities which can be present-at-hand.' See *BT*, 93.

tional totality that possesses '*significance*' for Dasein, and in this capacity they comprise the structure of Dasein's world (*BT*, 120-1/H77).

This ontological account, which acknowledges the psychological aspect inherent within our perception of the world, receives further consolidation through the notion of signs. Signs comprise an important part of a referential totality, and, therefore, Dasein's world. They address themselves to our 'circumspection' (*Umsicht*) (*BT*, 98) – the 'sight' with which we intuit how to use an object – allowing the environment surrounding them to become explicit in relation to our concerned dealings (*BT*, 110). In so doing, signs succeed in orienting a Dasein in its environment, allowing the aspects of the surroundings which might prove conducive to the realization of a possibility of Dasein's Being to be divulged. In Heidegger's words, "Signs always indicate primarily 'wherein' one lives, where one's concern dwells, what sort of involvement there is with something." (*BT*, 111.)

From this it becomes evident that in describing Dasein as 'Being-in-the-world', Heidegger intends to establish that the world is not an entity essentially alien to Dasein, from which we garner knowledge through disinterested, cognitive perception: the world does not become intelligible, or accessible via our regarding its objects as 'present-at-hand'. Such a manner of perceiving the world is, as noted above, merely an *existentiale*, and one by no means the most primordial and fundamental. Instead, because Dasein is fundamentally temporal – it can become concernfully engaged with both a past and a future, as well as the present – its world is found to comprise of ob-

jects which become involved with Dasein's projected possibilities. Dasein's world is, therefore, *holistic*: it is comprised of much more than the sum of its entities.

The only way in which the world can become intelligible is with reference to possibilities of Dasein's Being; primordially, the world is disclosed in its significance only on an intentional, or at least non-cognitive, level. It is this fact which makes manifest the essential unity of Being and the world. For it becomes clear that Dasein's Being is dependent on the world for its involvement, and in turn, for its eventual definition (authentic or not): 'Being-in-the-world ... [is] a way in which Dasein's character is defined existentially' (*BT*, 92). But given that the world's significance is the product of Dasein's intentionality, Dasein in its essentially temporal Being becomes the necessary and sufficient condition for the existence of a 'worldly' environment. Indeed, it would appear that if you strip Dasein of its intentional understanding, there would be no world⁴⁴ at all; for in depriving Dasein of its intentional understanding, you negate its facticity; and without facticity, Dasein no longer possesses 'Being-in-the-world': it thus becomes worldless (*BT*, 81-2). In sum, "Ontologically, 'world' is not a way of characterizing those entities which Dasein essentially is not; it is rather a characteristic of Dasein itself" (*BT*, 92).

Despite the apparent cogency of this argument, fundamental – and perhaps telling – objections remain. Firstly, it becomes apparent that, although it may be the case that Dasein incorporates objects into its environment in the manner of the ready-to-hand, it

⁴⁴ Not just in the third of Heidegger's four senses of the term 'world', but in all senses. See *BT*, 93.

remains that such incorporation presupposes there being, in the first instant, an object existing in its bare physicality, devoid of the purely personal connotations attached by (a) Dasein. The significance and relevance of an object varies between individuals, yet the subject of such variations remains a numerically identical object: 'at the lowest level... the object... confronts us as a ... mere physical thing.'⁴⁵ On this reasoning, it must be the case that, contrary to Heidegger's assertions, the ready-to-hand in fact presupposes the present-at-hand.

Ostensibly crucial as this objection might be, it is essentially myopic. If we consider the case of one of our early ancestors, say, living before the advent of hammers, we can suppose that, in desiring to force an object into a particularly resistant area (a peg into the ground, for example), the individual might seize upon an object heavier, and harder, than his hands (a rock, perhaps). Critics of the Heideggerian viewpoint might attribute the resulting selection as the outcome of regarding various objects purely in their bare physicality, and in a present-at-hand manner. However, there remains the fact that the discernment of hardness in this scenario was possible only within the wider context of the ready-to-hand; for in his circumspection, concerned to realize a 'towards-which', the individual became aware of an impediment to its successful fulfillment. Consequently, the referential totality which he had established became obvious, revealing as conspicuous the lack of an object for hammering. It was only as a result of the frustration of the 'towards-which' that consideration of objects in the mode of the ready-to-hand was abandoned in favor of the 'present-at-hand'. Despite

⁴⁵ An objection advanced by Edmund Husserl in his *Cartesian Meditations*. Cited in Cooper's *Existentialism*, p. 64.

this necessitating the consideration of the object purely in term of its physicality, the 'hardness' of the rock was revealed, and became significant, only in relation to the larger context of that particular Dasein's practical concerns. The objective characteristic of hardness was understood only because the individual could not achieve his task with his hands alone. If this account is accepted, it must be conceded that the present-at-hand presupposes the ready-to-hand, and the cogency of Heidegger's concept of Being-in-the-world remains intact.

The viability of Heidegger's viewpoint is further enhanced by its ability to account for the manner in which intentional, and psychological, considerations inform our Being. When we consider the world at large, or even our own particular culture, we find a collection of entities, all of which are invested with values (which are often contradictory or conflicting). For example, the fox is an animal vilified by some, which meets with indifference in certain people, and which is held in a positive light by others. This fact makes manifest the existence of what one might term different linguistic communities, each of which attaches a different connotation to the word 'fox.'⁴⁶ Heidegger's conception of Being-in-the-world is able to account for this fact, as it asserts that Dasein is not just 'in' the world (as an entity), but actually dwells within the world; the world is a fundamental aspect of Dasein's Being, a Being which possesses 'Being-in' as one of its fundamental aspects. Thus the fox becomes understood in different ways consequent to the differing interpretations each Dasein has of its own Be-

⁴⁶ For the purposes of this thesis, the term 'linguistic community' should be taken to refer to a community, among others, which attaches a particular connotation (e.g. positive, negative, or indifferent) to a concept denoted by a particular word (e.g. 'fox '). Thus of two differing linguistic communities, Community I could attach a positive connotation to the word 'fox '; which differs from Community II's negative connotation.

ing: the farmer understands the fox as a threat to the realization of his interpretation of himself as a farmer, and therefore belongs to that linguistic community investing the fox with negative connotations; the environmentalist may understand the fox in a positive light, as it exists as a symbol of positive concern in his interpretation of himself as a Being anxious for, and contributing to, the welfare of his natural surroundings. In this way the fox becomes involved in a Dasein's world: because in this way it becomes involved in the "'here' of an 'I-here'", which "is always understood in relation to a 'yonder' ready-to-hand, in the sense of a Being towards this 'yonder'" (*BT*, 171).

Once it is recognized that temporality reaches throughout the structure of Dasein, it is but a short step for us to realize that each of the three dimensions of temporality, though having their own demonstrable quality or character, must nonetheless demonstrate a reciprocal unity⁴⁷. For this unified nature – or, the ‘continuity of Dasein’ – provides for the unified ‘horizon’ of temporality in which Dasein finds the ‘Being-alongside’ of present existence, the ‘ahead-of-itself’ projected structure of ‘care’ – corresponding to the futural dimension – and the already realized, ‘Being-already-in’ determinations of his facticity, which correspond to the dimension of the past. Thus “Temporality makes possible the unity of existence, facticity, and falling, and in this way constitutes primordially the totality of the structure of care” (Heidegger 1992, p. 376).

⁴⁷ Something which will be underlined by our analysis of the ‘correlative and contemporaneous’ phase of the Reflex Arc coordination as it is presented by Dewey. See Chapter 4, Section 7 (especially pp. 92-3), below.

But with the realization that temporality provides the basis for the metaphysical continuity of Dasein, that it makes possible the unified horizon comprising of the united dimensions of past, present and future, and that it is the primordial structure of Dasein's characteristic mode of 'Being-in-the-world' – namely, *care* – then we must abandon the 'leveled down' focus of 'ordinary' time, and with it, the privileging of the present. Such a conception of time, in a manner which echoes Dewey's criticisms of the Reflex Arc concept in psychology, cannot account for the unified structure of time, as its privileging of the present divorces each privileged moment from the 'absent' dimensions of the past and the future. Even more tellingly, the fact that the present cannot be related in any significant way to either its past or the future means that, just as, on Dewey's reading, the individual phases of the deficient Reflex Arc concept cannot coordinate to form a comprehensive and dynamic phase of experience, the idea of ordinary time cannot either account for the experience of time passing, or even its basis as a structure of Dasein's experience.

That Heidegger has shown how an originary structure of temporality can account for both the passing of time, and the qualitative nature of experience (i.e. the structure of care), and that such a structure makes possible the leveled-down privileging of the present characteristic of ordinary time; then it must be admitted that he has also shown the means by which time can be derived from temporality, and that temporality, as a concept, has the significance to function as a grounding concept underlying the full scope of Dasein's Being-in-the-world –or, in other terms, mankind's very sense of existence.

With this, then, the basis for the full scope of the concept of temporality is explicitly established, and can thus be treated as a concept to be distinguished from that of *time* per se. Furthermore, as we shall see in Chapters 4 and 5, below, the logic and ramifications of Heidegger's proof that temporality must be the foundational term which makes experience possible exhibit several significant parallels with Dewey's criticisms, and subsequent reformulation, of the Reflex Arc concept in psychology.

Chapter 3: Gilles Deleuze

In the foregoing, alongside tracing within *Being and Time* the emergence of temporality as a discrete and informative concept in its own right, we have also come to observe that one of the chief concerns of Heidegger's phenomenological project is with the repudiation of a metaphysic, or a world-view, premised upon essentialist-based categories. As we shall see, this concern, configured by similar means and with similar results, holds also for both Dewey and Deleuze. For each of the three philosophers mentioned, in a manner analogous to that of the traditional conception of 'rational' judgment, such essentialist-based systems comprise of the (teleological) organization of relations susceptible to calculation, and are thus grounded in an a priori paradigm of quantification. The purpose of this chapter is, accordingly, to trace the putative mode of realization of a philosophy that operates beyond both essentialism, and, ultimately, the metric of quantification.

3.1. Deleuze on Bergson and 'memory'

According to Deleuze's book-length interpretation, in the course of his philosophical project Bergson was led to posit three different kinds of memory. The more mundane of these are the first two: 'habit-memory', and 'recollection-memory'. These two types of memory are orientated towards the praxial requirements of a lived-body: that is, they admit of a use-value. The first type denotes the adaption of motor-mechanisms such that they may function teleologically; the second, a capacity to utilize the past in order to enhance our ability to meet the requirements of the present. In this way the privileged domain of their operation is that of an actual, psychological consciousness. Yet the subsistence of this domain - and thus its operations - is wholly de-

pendent on the third designation of the term memory that operates on an *ontological* level: that of the *pure past*.

Such a concept is diametrically opposed to the prevalent empiricist memory paradigm, and, by extension, the concept of temporality on which it is based. Conceiving of time as a punctilinear succession, the present moment of which serves as a realized instant orientating a 'before' and 'after', the aforementioned temporal model translates itself to a memory paradigm that is capable only of conceiving of the past as coming into existence once it has realized the present, of which it represents a weakened version/image. The past and the present, perception and memory, are, according to this conception, differentiated merely by *degree* rather than *kind*.

Observing that this model was insufficient for any account of *how* time passes, Bergson sought to construct a different theory, from which three consequences follow. For in order that the present does pass, it is necessary – and this is the first consequence – *that the present and past be contemporaneous*, that the past coexist with the present that it has been (*B*, 58-9). In this way, the present presupposes the past as its pure condition. Thus Bergson goes on to propose that our actual existence, as it unfolds in time, 'duplicates itself all along with a virtual existence, a mirror image. Every moment of our life presents the two aspects, it is actual and virtual, perception on the one side and memory on the other.' Such a distinction, instead of being one of degree, is instead one of kind: thus whereas perception is *actual*, dependent on matter (and therefore spatial extension), memory is *virtual*, intensive, purely ontological; perception belongs to the realm of the psychological, memory, in its pure form, is non-psy-

chological; perception occurs in the present, memory only in the past. This last bifurcation highlights the fact – constituting the second consequence – that, in order to co-exist with the present it has been, *the past must exist of its own accord* (i.e. it is contemporaneous). To become stored ‘in’ the brain, given that this is, within the Bergsonian theory of perception, just one image amongst others, would be to negate the difference in kind between the order of time (memory) and that of space (from which present perception arises).

Considered from another viewpoint, while the present is the site of perpetual becoming, the past, if it is to be the store for recollection, must be preserved beyond the present: that is, in itself. In this sense, it can be said that, as *becoming*, the present is ‘outside itself’: therefore it *is not*, though it does remain the privileged site of action or the useful. The past, however, has ceased to be that which acts, though it *is* in the full sense of the word (*B*, 55). An act of recollection, then, though its end product may justly be considered to effect itself within the realm of psychology, originally – and fundamentally – involves a *leap* beyond the psychological present. This act, which is *sui generis*, detaches us from the present and places us at once in the past. For, just as we cannot perceive things purely within ourselves, but only where they are; so we cannot recollect the past unless we are placed, ourselves, in the past, there where we will find the particular recollection we seek. It is this that is the past in general, the pure past: the sphere of pure ontology.

The third consequence arising from Bergson’s theory is that the past must, given that it preserves itself in itself beyond the passing present, coexist with the present in its

entirety: it is *all our past* which coexists with each present (*B*, 59). In order to understand this we must return to the *leap* of recollection that places us into the past. Bergson says of this: we place ourselves ‘firstly into the past in general, then into a certain region of the past’ (*B*, 61). Each of these regions is virtual – that is, ‘belonging to the being in itself of the past’ (*B*, 60) – but contains not merely particular elements of the past, but the totality of the past at a more or less contracted or expanded level. Thus the past coexists with itself at every level, every degree of tension, and all degrees of relaxation and contraction: it *repeats* itself, *at the same time*, on its every level. (It is in this sense that we can, with Bergson, come to understand the concept of duration as necessarily involving succession; namely as repetition of the entire past on different, coexisting planes of past.)

Yet there are, within each level, *remarkable* or *shining points*, dominant recollections (or, as below, *attractors*), which vary the theme of one level from another. Having placed oneself on a peculiarly contracted level of the past, having observed the ‘appeal of recollection’, for the past to become actualized in a recollection-image (the ‘evocation’ of the image) the importunate, urgent nature of the present moment must be heeded. The needs of the present situation initiate the leap onto a particular level that is assumed capable of meeting our requirements; the level, though, may be too contracted or expanded, and the apposite recollection may not be found. When it is located, however, memory responds to the appeal of the present via two simultaneous movements: *translation*, by which memory in its entirety contracts, without dividing, in order to meet action; and *rotation*, wherein it turns toward the present situation that side of itself which will prove most useful (*B*, 63-4). The relevant recollection thus

loses the impassivity and ineffectiveness that characterize recollections, becoming instead a 'recollection-image', that which is capable of being recalled to the realm of praxis. To be recalled, and proceed through the distinct 'planes of consciousness', is to be contracted to the ultimate level of contraction: the present. It is to be embodied, actualized. It is actualization alone that constitutes psychological consciousness (see *B*, 63).

To posit that, contrary to common sense, we move *from* recollection *to* perception, *from* the past *to* the present, has revolutionary ramifications, and matches exactly Dewey's statement that 'response' acts on 'stimulus', etc. in his Reflex Arc paper. Indeed, the implications following from Bergson's outline of the ontological nature of the pure past were further developed by Deleuze, coming eventually to constitute the basis for his attempt to construct a non-entropic system involving a non-metric, 'smooth' space of the manifold; that is, a system adequate to thought of multiplicities rather than closed, entropic, and essentialist-based systems.

3.2. Deleuze and the ontology of 'the virtual'

Perhaps the most signal point of departure for a detailed account of the ontological nature of the virtual is this statement concerning dx/dy , early on in Chapter IV of *Difference and Repetition*:

“In relation to x , dx is completely undetermined, as dy is to y , but they are perfectly determinable in relation to one another. For this reason, a principle of determinability corresponds to the undetermined as such.” (*DR*, 172)

With this we observe the rejection of the Cartesian method of characterizing a geometrical object. The Cartesian method may be characterized as operating on the assumption that, for example, a curved surface is embedded in a three-dimensional space, itself characterized by a fixed set of axes (e.g. x and y), these being used to assign coordinates to every point of the surface. Such a procedure eventually allows for the expression and determination, via algebraic relations, of the geometric links between surface-points. Instead, following the differential calculi of Gauss and Riemann, Deleuze favors thought capable of proceeding without any reference to either a global or meta- coordination, or indeed to any extrinsic determination, the very points of the surface themselves creating an interdependent method of ‘coordinatization’. Thus ‘Each term exists absolutely only in its relation to the other: it is no longer necessary, or even possible, to indicate an independent variable.’ It is for this reason that a ‘principle of reciprocal determinability as such here corresponds to the determinability of the relation’ (*DR*, 172). Ultimately, such thought amounts to the delineation of a new space of multiplicity, which comes to constitute the basis for the field of Ideas – ‘a system of differential relations between reciprocally determined genetic elements’ –, or that which is coextensive with the virtual (see *DR*, 173-4).

To see how this is possible requires an analysis of ‘the Idea’. We have seen that they are the eventual product of reciprocal determinability, that which suggests the opera-

tion of difference. But this fact discloses only the second condition within the emergence of an Idea. For when it is remembered that an operation of external determination does not feature in this system, there arises the implication of a state of *indetermination* necessarily prior to reciprocal determination – thereby fulfilling the first condition. This is confirmed with the statement that ‘Ideas are multiplicities’ (*DR*, 182), an assertion which takes us to the heart of Deleuze’s open, non-deterministic thought. For the notion of multiplicity does not, as traditionally received, designate a combination of the many and the one; but rather ‘an organization belonging to the *many as such*, which has no need whatsoever of unity in order to form a system’ (*DR*, 182: emphasis mine). The concepts of the ‘one’ and ‘many’ are inadequate for such thought, their ‘identity’ being constituted by a ‘distorted’ dialectic which proceeds merely by way of opposition, a process at once both entirely insufficient to the refined and nuanced discreteness of singularities and Ideas, as well as implying a problematic equivocity amongst elements. By contrast, the structure of a multiplicity, having neither prior identity nor conceptual signification, cannot admit of being posited as ‘one or the same...’ It is, then, basically indeterminate, that which admits of definition only *intrinsically* (i.e. via the principle of reciprocal determination). It is in this way that it is the very ground of possibility for the manifestation of difference free of all subordination, itself the ground for thought of the *many as such* operating beyond the strictly numerical conceptions of the one and many and within the bounds of univocity (see *DR*, 182-3).

We are now in a position to appreciate Deleuze’s definition of an Idea as ‘an *n*-dimensional, continuous, defined multiplicity’ (*DR*, 182). An Idea is *n*-dimensional in that it

is, rather straightforwardly, of any number of dimensions. Not having any supplementary or extrinsic dimensions that transpire upon it, nor any basic determination/identity, it becomes a free state-space, admitting of n -degrees of freedom. Being a multiplicity, an Idea is, furthermore, structured in a continuous manner, a state of affairs which must be received in (at least) two primary senses: an Idea is that which is *intensive* (cannot be divided without changing in kind) rather than *extensive* (intrinsically divisible); and is that which *coexists* in complex, obscure fashion, with adjunct fields. This is because Ideas are made, or unmade, ‘according to the conditions which determine their fluent synthesis’ (*DR*, 187), an assertion which can better be understood with reference to state space and the theories of Poincaré.

A state space comprises of two operators: ‘differentiation’, providing the value for a rate of change for two or more dimensions of a manifold; and ‘integration’, which reconstructs, from a set of such values, a series of states or a full trajectory. Of a given manifold changing through time, trajectories can be discerned which, after repeated application of the differentiation operator, yield ‘vectors’, which together comprise a ‘vector field’. The vector field delineates the inherent – and therefore *virtual* – tendencies of the trajectories, thereby describing the existence and distribution of *singularities* (attractors) within the field. The specification of the existence and distribution of singular points in this case, as well as in that of the Idea, depends upon (1) the specification of adjunct fields, or the modality of the connections between fields; and (2) the conditions prevailing throughout the field, especially those created by adjunct fields. It is in this sense that “Ideas contain all the varieties of differential relations and all the distributions of singular points coexisting in diverse orders ‘perpllicated’ in

one another” (*DR*, 206). It is, finally, the nature of this coexistence within smooth space that results in the *definition* of a multiplicity, working in a manner analogous to reciprocal determination.

This ontological, smooth space of Ideas comprises only one half of difference: namely, the dialectical half, or that which is determined by differentiation as the manner in which Ideas reciprocally differentiate their peculiar arrangement of singularities. Deleuze also identifies the dialectical half with problems, which are themselves, in turn, of the order of events. The other, complementary half, in which Ideas are incarnated or actualized, is the aesthetic – that which is determined by differentiation – which corresponds to the plane of solutions. We find, then, an irreducibly double system, a ‘double series of events which develop on two planes, echoing without resembling each other’ (*DR*, 189). This last clause is of paramount importance. For Deleuze goes on to assert that the ideal series enjoys the property of ‘transcendence’ in relation to the real (*ibid.*), a notion which would appear to reintroduce the operation of pre-determination which is directly counter to the aim of Deleuze’s project. Yet such an appearance is misleading: the relation between the virtual and actual is one of onto-heterogenesis, placing it beyond a causal relationship in which the effect is identical to the cause. For, in opposition to the identity-bound relationship between the possible and the real, where the real merely duplicates, and ‘adds’ - in the manner of an inconceivable brute eruption - ‘existence’ to the possible, which is itself a retroactively fabricated image of the real; the actualization of the virtual proceeds by way of immanent difference, divergence, and differentiation. Each such divergence or difference takes the form of a divergent line, which corresponds to *a* manner of solving a problem in-

sisting within the Idea. If we agree that every solution is an *interpretation* of the problem, such a statement can suggest, in the manner of a metaphor, how ‘In this sense, actualization or differentiation is always a genuine creation’ (*DR*, 212).

It is in this way that the virtual can be said to possess reality, but not actuality (*DR*, 209). For the preceding analysis has demonstrated that the reality of the virtual consists of two chief aspects: a discernible determination; and a structure operating in a transcendent relation to a real object (cf. *DR*, 208-9). Determination arises from reciprocal determination between singular points of an Idea and relations of difference between Ideas; but also from a process of complete determination proceeding, among singularities, in a manner analogous to that of a vector field, which delineates the varieties of relations and coexistences periplicating Ideas without designating a privileged viewpoint. Such complete determination lacks merely the *whole*-oriented relation sets that belong to actuality.

The transcendent virtual structure incarnates itself in an actual object, as noted above, via a process of differentiation, which is ‘at once both composition and determination of qualities [of parts: see *DR*, 217], organization and determination of species’ (*DR*, 214). The former correspond to the incarnation of the singular points of an Idea, the latter to the actualization of its differential relations (*DR*, 217). But such differentiation presupposes spatio-temporal dynamisms. Spatial dynamisms function as those spaces in which the *dramatization* of Ideas can proceed. Such a space creates the conditions for a *tracing* of the differential relations, and the singularities of the Idea. In an explicit parallel with Dewey’s concept of rhythm (see Chapter 4, Section 5, above),

the temporal dynamisms, *functioning as differential rhythms*, incarnate the time of the structure in the manner of progressive determination. (This is of importance as it highlights once again the lack of determinism, and the inverse prevalence of undecidability or ‘choice’, within the virtual; for it is only consequent to this, and the fluid synthesis of the singularities, that the virtual can be determined only *progressively*, that is – in the manner of an asymptote – never completely.) In this respect dynamisms, as dramatizations of Ideas, move beyond the representationist schemata-concept hierarchy of transcendental spatio-temporal determination – forever asymptotic due to the un-transcendable rupture between the two hierarchical levels –, for precisely as a dramatization it is *internal* to Ideas: that is, dynamisms immediately incarnate the very differential relations and singularities of an Idea. In this way dynamism, as agent of differentiation, and incarnation of differentiation, comprises its own power of determining space and time, whilst simultaneously preserving the univocity of Being in relation to both the virtual and the actual (*DR*, 218).

This account of the basic ontology of the virtual, combined with the Deleuze-Bergsonian temporally-orientated exposition of the virtual nature of the pure past, provides us with a model of the virtual which illuminates two of its chief aspects. The two aspects meet on the verges of consciousness, one of the three levels of actualization (the others being space and time). For every spatio-temporal dynamism is accompanied by the emergence of an elementary consciousness born at the threshold of the body/object; consciousness, then, operating fundamentally as the double of every object, allows the tracing of directions, the doubling of movements and migrations (*DR*, 220). At the same time the three conditions of an Idea are mirrored in the essen-

tial aspects of sufficient reason: determinability, reciprocal determination, complete determination (*DR*, 210).

Yet with the emergence of the fuller picture problems arise. It would seem, for example, that two aspects are fundamentally incompatible: the emphasis on the open, smooth and non-entropic functioning of the virtual ontology being contradicted by the temporal hegemony of the pure past. For if the present is merely the point of the ‘becoming’ of the past, have we not sacrificed the possibility of originality and the new in favour of sheer determinism? Similarly, though the ontological account of the virtual emphasizes the immanence and univocity of Being *qua* both virtual and actual, does not the virtual-actual divide risk providing the ground for a basic equivocity, the virtual/Idea, for example, coming to function as a sign of the open ‘totality’ of Being within the categories of the actual? But before such issues can be addressed in full, it is necessary that we return to examine the third and final figure of our trio of Dewey, Deleuze and Kant, in order that we might appreciate the reciprocal ramifications – if there are any – observed between the conjunction of the philosophies of not just Dewey and the virtual, but each of these with the philosophy of Immanuel Kant.

3.3. Learning and the prospect of ‘the new’: Deleuze’s *virtual* as a parallel to the concept of temporality in Dewey’s reformulated Reflex Arc

Much as ‘freedom lies in choosing the levels’ (*DR*, 83) on which to continue the passage of our lives, any encounter between Dewey and Deleuze proceeds through the selection, by way of affinity, of the present most affective of desire. This because such a state of desire induces a level of automatic-circumspection in which we are able to recognize, once again through the operation of *destiny*, the qualitative difference

denoting the singularities (peaks, points) most apt to the eventual realization of this encounter. It would not be too much, here, to assimilate the reciprocal determination of the form of desire and the final event creating Dewey's reconceived philosophical project with the formulation of two crucial *questions*: 'What is temporality for Dewey?' and 'What happens when we learn?' amounting to a response which unfolds in representation in the manner of 'a field of problems, with the rigorous imperative to search, to respond, to resolve' (*DR*, 85: cf. pp 197-8).

Though we may have shown how it is possible to 'create' within the pure past, we are not (yet) capable of demonstrating the achievement of the new. For the glimpses afforded of the acts of creation so far still amount to a basic retention of identity on behalf of an intentional, all too intentional subject. One consequence of this perceived basic identity of the subject is a continued linking of time with representation, or what is equivalent, a failure to move beyond the second synthesis of time. For despite surpassing representation through the manifestation of a grounding difference at the level of the in-itself, the second synthesis still remains relative to, and in consequence is proved only by, the representation that it grounds (*DR*, 88). Thus the in-itself of the past exhibits a basic identity through the relation of resemblance to its repetition within reminiscence, thereby rendering the representation of presents, even within the involuntary memory of objective chance, *circular*. Rather than the intensive changes in kind characteristic of the temporal, the grounding of the second synthesis still operates in a manner analogous to 'movement', even if it is a "movement... [in] the soul" (*ibid*); the in itself of the past, and the repetition of reminiscence, amount merely to an 'effect' to be denounced as an illusion correlative to representation. On the

level of the subject this second time constitutes only the present of metamorphosis, “a becoming-equal to the act and a doubling of the self, and the projection of an ideal self in the image of the act” (*DR*, 89). Translated to our present thesis this represents our reading of Dewey becoming capable of the act of disjunction wherein the differential nature of Being can be cognized, and the self becomes susceptible to and riven by - indeed receives its determination in conjunction with - the forces of external necessity (chance, destiny, etc.). In this becoming-capable we might genuinely be regarded as acceding to the threshold of the new, of the future. But advancing to this will require a much more detailed consideration of Dewey’s philosophy – reinterpreted in the light of what we have seen already of Deleuze’s own ideas of time and the virtual (in Chapter 5, above).

At present, though, we might presage this analysis with something of a prefatory note, applying something of what we have learned of Deleuze’s project to the notion of the synthesizing ‘I’ or ‘self’ that is found in Kant’s ideas of the mind and consciousness. For if a time of the future is to appear there must be an un-grounding engendering a pure and empty form of time. For the creation inherent in desiring production to become truly new a caesura must be announced ushering in a future in which only difference is repeated, beyond the control of the ‘I’, self or ego. Thus the *third* time in which the future appears “signifies that the event and the act possess a secret coherence which excludes that of the self... they turn back against the self which has become their equal and smash it to pieces” (*DR*, 89). This enacts the repudiation of a self that seeks to fill time, substantiate it with itself and with a content, thereby creating the possibility for identity and resemblance. Instead, in the same way that $dx/$

dy can be reciprocally determined beyond any global coordination, the self must become part of a future which itself must be reciprocally determined beyond any global determinant: “The synthesis of time here constitutes a future which affirms at once both the unconditioned character of the product in relation to the conditions of production, and the independence of the work in relation to its... actor” (*DR*, 94). In a succinctly stated structure of what we will come to see is an act of *learning* - in which, at least on an individual level, the new can be created, or arise - from the foregoing statement we can say that, for Deleuze, the conditions of production correlate to the past; the actor to the present; both of which, and including the future, function as *repetition*, but in very different modes. The present ‘is the repeater’, given the role merely of an *agent* destined to be effaced; the past is ‘repetition itself’, the infinite network of virtuality, or the ground of memory operating in a transcendent function; the future ‘is that which is repeated’, or the empty form or caesura which alone is able to return. The future makes use of these prior stages in order to make repetition, not that from which one ‘draws off’ a difference, nor that including difference as a variant, but the thought and production of the ‘absolutely different’, or ‘difference in itself’ (*ibid*). The activity of becoming adequate to difference in itself, or the time of the future must, however, be *thought* (*DR*, 110). Such an act occurs only in the form of a modification, or affection that the ego – or ‘I’ – both initiates *and* passively experiences. This is possible because the basic ‘I am’ underlying the subject is undetermined, and can only become determined by an ‘I think’; yet for determination to occur requires the mediation of a third term: the determinable, which establishes between the two prior values a transcendental, yet internal Difference. The form of the determinable is time. Consequently, the subject can only be determined *within* time,

meaning that the spontaneity of the 'I think' is not an attribute of a substantial being, but rather the affection of a passive self experiencing its own thought as that exercised *upon* it, not *by* it (*DR*, 86). Time thus fractures the I forcing it to operate upon itself as Other. The becoming adequate to the time of the future involves the affirmation of this fracture, which simultaneously amounts to the dispersal of the self in a purely empty (as in 'not filled by any singular substance') time, consisting of an infinity of 'excessive systems which link the different with the different, the multiple with the multiple, the fortuitous with the fortuitous' (*DR*, 115). Stated in the terminology used above, the affirmation of the fractured I within the time of the future is the repeated repeating of repetition in itself.

It is in this way that the 'absolutely new itself' can be produced. This third time, the time of excess, affects only that which has been produced 'by default' via the intermediary of metamorphosis: that is, it affects only that which has internalized, become adequate to, a particular composition - constellation, if you will - of difference. But there is one final factor: neither the agent (of metamorphosis), nor the condition (of difference) will return. Their repetition under the empty form of time constituted a dissemination by way of excessive repetition, a description of an eternally excentric arc; the 'form' of time is an excessive formlessness belied by a universal un-grounding turned upon itself: all that returns is the yet-to-come (see *DR*, 90-1).

It is also in this way - the way of producing 'the new' - that we are enabled to understand something of the way in which, for Deleuze, *learning* occurs. Though it is not the case that every act of learning occurs as an instantiation of the third synthesis of

time, I would nonetheless argue that, by proceeding on a largely unconscious level within the scope of the second synthesis of time, an act of learning does open-up the ‘I’ of the learner to the wider scope of the virtual and time, and does, in one sense, proceed according to (some of) the conditions of metamorphosis. It might be, then, that an act of learning traces itself along the boundary between the second and third syntheses of time. Indeed, for Deleuze, learning does venture to some degree beyond the sphere of *representation*; it does not amount to simply copying or imitating the gestures or concepts represented or expressed by a teacher, as “Learning takes place not in the relation between a representation and an action (reproduction of the Same) but in the relation between a sign and a response (encounter with the Other)” (*DR*, 22).⁴⁸ Instead, the individual encounters a field of elements, of distinctive points (a light, a glance which focuses on it, a motor-habit of reaching toward light, an arm, a hand, etc.) which, encountering an unexpected element (a burning sensation), find their habitual relational conjugation disrupted, thereby establishing a problematic field, or problem. For the problem to be dissolved is for the individual to find the way in which to re-arrange and re-establish relations between the particular distinctive points such that, emerging to the consciousness of our perceptions, cognition of the real relations among the elements permits adjustment of our consciously directed acts:

“To learn to swim is to conjugate the distinctive points of our bodies with the singular points of the objective Idea in order to form a problematic field. This conjugation determines for us a threshold of consciousness at which our real acts are adjusted

⁴⁸ Cf. “The movement of the swimmer does not resemble that of the wave, in particular, the movements of the swimming instructor which we reproduce on the sand bear no relation to the movements of the wave, which we learn to deal with only by grasping the former in practice as signs. That is why it is so difficult to say how someone learns: there is an innate or acquired practical familiarity with signs... We learn nothing from those who say: ‘Do as I do.’ Our only teachers are those who tell us ‘do with me,’ and are able to emit signs to be developed in heterogeneity rather than propose gestures for us to reproduce.” *DR*, 22-3.

to our perceptions of the real relations, thereby providing a solution to the problem. Moreover, problematic Ideas are precisely the ultimate elements of nature and the subliminal objects of little perceptions. As a result, 'learning' always takes place in and through the unconscious, thereby establishing the bond of a profound complicity between nature and mind." (*DR*, 165)

To render the scenario within the terms of Dewey's child-light-burn scenerio within the Reflex Arc essay: the problematic field, or problem, occurs when the child enacts what for Deleuze is a 'passive synthesis,' or *conjugation*, of the distinctive points of the scenario (hand, flame, head, eye movements, motor act of reaching, etc.). This synthesis is termed 'passive' because it occurs on the unconscious plane, and does not yet possess the 'active' synthesis which is determined by possession of a 'general concept' which enables the rule-possessing solution to the problem we find in knowledgeable action. In *Difference and Repetition*, Deleuze uses the example of a monkey who 'learns' its food is in a box of one particular color among several others. The initial, disordered scenario sees the monkey picking up boxes at random, but Deleuze observes "there comes a paradoxical period during which the number of 'errors' diminishes even though the monkey does not yet possess the 'knowledge' or 'truth' of a solution in each case" (*DR*, 164-5). This paradoxical period is exactly the point at which the individual encounters the objectivity of the problem - that is, the child brings together the elements - seeing, light, reaching, flame, burn, and so on - into a relation which allows for consistency, and which constitutes the 'sign' of the problem which does not yet possess the rule-based 'solution.'

The solution, however - and thereby the completion of an educative experience, or a moment of learning - does not follow as a matter of necessity. It is possible that the elements of the problem do not conjugate to form what Deleuze calls a 'plane of consistency', the relations between them do not stabilize, and we thus experience a failure to learn. In the case wherein no plane of consistency is established in relation to the problem, either chaos ensues, or, as more likely, the child retreats to the narrower plane of already extant habits, coordinations and routines.

It is for this reason that we understand something that is readily observed in any classroom: learning is a difficult and precarious process, the outcome for which can never be assured. It may be that for any given individual, there are too many elements to be conjugated and drawn into the stable relations required for a plane of consistency to arise. In this case, the coordination will be overwhelmed (imagine introducing to the child-candle scenario the loud and unexpected noise of a bystander crying out in alarm. Should this cause the child to withdraw their hand according to an extant reflex, the act of learning in relation to a burn will not be established, the stimulus of the noise overwhelming the 'seeing-into' of the burn). Accordingly, for connections among the elements to become established on a consistent basis, it is essential to achieve an equilibrium state, that which charts a course between being overwhelmed by 'too many' elements on the one hand, and the retreat to extant habits and coordinations which follows the refusal or avoidance of establishing connections between the elements on the other. In this way, for Deleuze - and I would aver, for Dewey, too - a successfully educative experience, or genuine act of learning, occurs when an indi-

vidual engages with the objectivity of the problem and constructs a plane of consistency which is then able to actualize “the calm possession of a rule enabling solutions” which constitutes the very nature of knowledgeable action.⁴⁹

The ‘new’ element which arises in the act of learning is not, however, the simple addition of the concept of ‘burn’ to the existing relations of the coordination. Indeed, as Dewey is at pains to point out in his Reflex Arc essay:

“The ordinary reflex arc theory proceeds upon the more or less tacit assumption that the outcome of the response is a totally new experience; that it is, say, the substitution of a burn sensation for a light sensation through the intervention of motion. The fact is that the sole meaning of the intervening movement is to maintain, reinforce or transform (as the case may be) the original quale; that we do not have the replacing of one sort of experience by another, but the development (or as it seems convenient to term it) the mediation of an experience.” (*RCP*, 360)

In accord with Deleuze, the ‘new’ arises as a consequence of a *transformation* of the relations which the individual perceives between the elements of the Idea, and the plane of consistency which is established on the basis of prior experience of the pattern of these relations in connection with what is perceived, and the habitual patterns of behavior. In this way, the ‘new’ element of learning consists in the repetition of the agent such that the distinctive points are aligned in a new conjugation, allowing for a different experience of those relations, and thus the establishment of a different, expanded and transformed ability to configure the distinctive points of the body and the field of perception in a settled and consistent way, a way which amounts to the application of a rule, or a settled act of knowledge. Thus:

⁴⁹ This analysis follows Jeff Bell’s illuminating explication in “Deleuze on Learning and Skill.” My analysis differs in its application to the child-candle scenario of the Reflex Arc. See <http://www.newappsblog.com/2014/04/deleuze-on-learning-and-skill.html>

“When a body combines some of its own distinctive points with those of a wave, it espouses the principle of a repetition which is no longer that of the Same, but involves the Other - involves difference, from one wave and one gesture to another, and carries the difference through the repetitive space thereby constituted. To learn is indeed to constitute this space of an encounter with signs, in which the distinctive points renew themselves in each other, and repetition takes place while disguising itself.” (*DR*, 22-3)

Chapter 4: Dewey on time and temporality

4.1. Time and temporality; philosophy and education

There are significant works dealing with time and/or temporality as they relate to, for example: the history of western philosophy and science (Bardon and Dyke 2013; Turetzky 1998); contemporary philosophy (Margolis 2010; Rosenthal 2000 & 2010); contemporary physics (Prosser 2007 & 2013; Sandbothe 2001; Wallace 2013); education (Huebner 1987); pragmatism (Fairfield 2010; Margolis 2010; Rosenthal 2000); the work of Gilles Deleuze (Deleuze 1999/1956, 1994/1968, 1978a & b, 2005/1981, 1986/1983, 1989/1985; Somers-Hall 2011); and the work of Martin Heidegger (Heidegger 1962/1927, 1992/1925); all of which are of relevance to my thesis. These are, however, somewhat incidental to the main point of my proposed dissertation, which is the concept of temporality as it emerges in Dewey's early work, especially as it relates to the field of education, and the nature of that mode experience – educative experience, perhaps – which underlies the process of learning.

4.2. A narrative emerges

When we consider works by Dewey (1925, 1929, 1934, 1938/40), Garret (1972), Richards (1972), Helm (1985), Calore (1989) and Mozur (1991), it is undeniable that we are enabled to construct at least one coherent narrative for the evolution of Dewey's utilization of the concepts of time and temporality. As indicated by the title of Helm's (1985) study of Dewey's career, and Garrett's situating of Dewey's thought against the background, in the early part of the 20th century, of the 'much larger movement to "take time seriously"' (Garrett 1972, 439), the obvious means by which to construct such a narrative centers around the increasing importance for Dewey of

the question of time. On the one hand, Richards and Helm construct accounts structured according to distinguishable phases of Dewey's treatment of time and temporality⁵⁰; and, on the other, Garrett (1972), Richards (1972) and Helm (1985) detail the evolution whereby Dewey's attempt to 'temporalize time' becomes the explicit means by which he seeks to both 'reconstruct' philosophy, as well as provide a naturalistic grounding for his work which is adequate to factors such as lived experience, the findings of the natural sciences, and the conceptual consistency of a rigorous philosophy (Calore 1989, 12-13).

4.3. Dewey's 'temporalization' of time

As we shall see, there is only a small literature of substantive work on the concept of temporality as it relates to Dewey's oeuvre. This includes what, at first glance, at least, appears to be scant mention or treatment of the concept by Dewey himself. That a concept of temporality does exist – indeed, is of significance for Dewey – is attested to, however, by several works written by contemporary Dewey scholars such as Roland Garrett (1972), Bertrand Helm (1985), Gary Calore (1989) and Gerald Mozur (1991). Robert Richards (1972), though not explicitly concerned with Dewey's treatment of time and temporality – charting instead the developing complexity of Dewey's conception of 'natural events' throughout the phases of his thought, and how each phase relates to the concept of *materialism* – nonetheless lends support to the

⁵⁰ Though not concerned directly with Dewey's treatment of time, Richards nonetheless (1972) identifies 3 stages in Dewey's career, basing these on his relation to the concept of 'materialism'. Helm, focusing explicitly on Dewey's attempt to temporalize time, is concerned with 'The theme of time in terms of temporal quality and temporal order that arises in his psychology, logic, epistemology, and metaphysics. As his views developed in those substantive areas, so too did his ideas about the nature and modes of temporality' (Helm 1985, 291).

conclusions drawn by the aforementioned authors concerning the means by which Dewey's thought changed conceptually, as well as in terms of its scope of reference.

More importantly – and somewhat revealingly for our thesis – Dewey himself directly addresses the concept of time in his contribution to the 1938 James Arthur Foundation series of lectures on '*The Mysteries of Time.*' As noted in Helm's (1985) comprehensive overview of Dewey's career as it evinces the evolution of his concepts of time and temporality, it is this lecture which provides the culmination of Dewey's earlier employment of temporality – starting with *Experience and Nature* (1925), receiving further refinement in *Art as Experience* (1934) *Democracy and Education* (1916), and continuing through to his joint work with Arthur Bentley – as a means to 'temporalize' philosophy. Such a move thereby both emphasizes philosophy's nature as a *process* rather than a static field of thought defined by, and deriving from, the essentialist-based errors of past philosophies (with Plato, perhaps, being the prime example. Cf. Calore 1989, 12, 336; Garrett 1972, 439; Mozur 1991) and furthers Dewey's attempt to overcome the 'antithetic ontological positions of mechanistic materialism and teleological spiritualism through the recognition of their partial and instrumental characters as interpreters of nature' (Richards 1972, 56–7). That is, temporality per se becomes not just a foundational component of *individuality* and *experience* – especially when considered from an aesthetic point of view – but also functions as the basis for his entire philosophical conception of both *nature* and *reality* (Calore 1989, 13). In this way, it can be said that Dewey's consideration of the concept of temporality, especially as it arises from his investigation of the concept of time, becomes a central guiding feature of his career as it spans from his 1925 release *Experience and Na-*

ture, continuing in *The Quest for Certainty* (1929), and *Art as Experience* (1934), then through the subsequent works until the end of his life (Helm 1985, 307; Richards, 1972, 59; Calore 1989, 12-13).

As Helm (1985) goes on to detail, in the lecture ‘Time and Individuality’ (1938; published as *Time and Its Mysteries*, 1940), Dewey not only re-conceives time *per se* as ‘the central problem of philosophy’; but, just as significantly, as a foundational component in his final project⁵¹, conceived by Dewey as the philosophical need to (re)interpret *individuals* as no longer compatible with the *essentialist*-based and ‘universalizing’ metaphysics of most previous philosophies, but rather as evolving/ devolving *events*.⁵²

Of equal import to our inquiry is the related distinction, drawn in *Experience and Nature* (1925, 110-11), between ‘temporal quality’ and ‘temporal order’. Mozur renders ‘temporal *quality*’ as that which is ‘possessed by any process’, is grounded in final fashion by the ‘dynamic’ character of events in nature, and is ‘immediate’ to our experience, especially our experience of temporal duration. This is opposed to ‘temporal *order*’, which is a ‘product of inquiry because it requires a temporal metric and a system of coordination between events that is not immediately had in experience’ (Mozur 1991, 326). Thus:

⁵¹ Which Helm (*ibid.*) considers Dewey to have outlined in substantial detail in his attempt to describe the temporal ground of inquiry in *The Quest for Certainty* (1929).

⁵² Following Helm (1985), 310. This will also be of significance when considering the parallels between Dewey’s and Deleuze’s respective philosophical projects.

“Temporal quality is however not to be confused with temporal order. Quality is quality, direct, immediate and undefinable. Order is a matter of relation, of definition, dating, placing and describing. It is discovered in reflection, not directly had and denoted as is temporal quality. Temporal order is a matter of science; temporal quality is an immediate trait of every occurrence whether in or out of consciousness. Every event as such is passing into other things, in such a way that a later occurrence is an integral part of the character or nature of present existence. An "affair," Res, is always at issue whether it concerns chemical change, the emergence of life, language, mind or the episodes that compose human history. Each comes from something else and each when it comes has its own initial, unpredictable, immediate qualities, and its own similar terminal qualities.” (EN, 110-11).

Much of this is corroborated in Roland Garrett’s interpretation of Dewey’s career.

Writing – as Garrett notes (1972, 439) – in response to the effort of his contemporaries to “take time seriously” through the development of a philosophy of the ‘event’, Dewey’s work came ultimately to provide a new and highly innovative point of departure. Rather than, as with Whitehead, follow his analysis of the nature of the event to deduce that ‘events do not change’ (Garrett, *ibid.*), Dewey’s rejection of precisely this principle led him to ‘the recognition of temporality’. And, whilst it may be true that, prior to his 1938 essay on “Time and Individuality”, Dewey nowhere treated the concept of temporality either in an overt manner or in any great detail, the clues as to the operative function of this concept within his work, and its corresponding status within his naturalist philosophy, led Dewey to what Garrett terms ‘a greater innovation’ (Garrett 1972, 440) than was achieved by his contemporaries.

4.4 Dewey’s concepts of ‘individuality’ and ‘event’

As Mozur establishes in his close reading of ‘Time and Individuality’, for Dewey, "organic behavior is a strictly temporal affair"⁵³, a position from which it logically

⁵³ Dewey 1938a, p. 50. Cited in Mozur 1991, p. 321.

carries that ‘organic beings are therefore intrinsically temporal entities’ (Mozur 1991, 321). This has further implications for Dewey’s characterization of *nature*: by rendering both temporal career and time a function of the development and change of *individuals*, it becomes easier for us to understand Dewey’s corresponding move to establish nature as something which is fundamentally event-based.

As Mozur notes, ‘The term ‘event’ is intended to express the fact that nature exhibits process, transaction, and connection. For Dewey, “nothing in nature is exclusively final” (*EN*, 120), a characterization which, significantly, Dewey extends as far as each human being (*ibid.*, 324). In endorsing the logic of such a move, Richards (1972, 57-8) further notes that in regarding ‘the traits of matter and mind [firstly] to be properties of *natural events*, and not mind the property of matter and vice versa... [and secondly, holding] neither mind nor matter to be reducible to the other’, Dewey avoids reverting to the problems of a reductionist materialist position which, in holding that a complete knowledge of the physical provides an adequate knowledge of the mental, cannot account for the creative complexity and dynamism of natural events.

Dewey’s concept of an event, in contrast to the prevailing understanding of the word (Richards 1972, 62), thus becomes endowed with a more holistic, encompassing scope. An event ‘involves both the individual pattern of growth and the environmental conditions’ (*ibid.*), a philosophical position which at once undercuts the subject-object distinction, aligns itself with the phenomenon of the ‘role of the observer’ in quantum

mechanics⁵⁴ (cf. Richards 1972, 66), and renders fallacious much of the metaphysical grounding for the traditional problems arising from the putative separation of cause and effect, mind and body, man and nature/environment, and so on (Richards 1972, 57 & 62).

Instead, for Dewey, the human individual is ‘inextricably connected to other events’ (*ibid.*), and, in Dewey’s terms, the individual “belongs in a continuous system of connected events which reinforce its activities and which form a world in which it is at home” (Dewey 1988/1925, 188. Cited in Mozur 1991, 324; cf. Richards 1972, 65 & 66). This, then, becomes the basis upon which Dewey can establish his conclusion that it is illegitimate for any theory to regard physical individuals as having the ‘unchanging, immutable natures independent of the relational, statistical, and probabilistic characterizations provided by science’ (Mozur 1991, 331). It is for this basic reason that Dewey is enabled to assert that time “enters into their very being (Dewey 1988/1938/40, 107; Mozur 1991, 331).”⁵⁵

4.5 Dewey’s concept of ‘*rhythm*’

According to my own interpretation of Dewey’s works, allied to the corresponding interpretations of Dewey scholars outlined above, both the existence, and function, of

⁵⁴ Cf. Dewey’s statement that “When a state of affairs is perceived, the perceiving-of-a-state-of-affairs is a further state of affairs” (*EN*, 101). With regard to the role of the observer in quantum mechanics, consult the following for an evidence-based explanation of this phenomenon: <http://www.sciencedaily.com/releases/1998/02/980227055013.htm>

⁵⁵ Cf. “Temporal seriality is the very essence, then, of the human individual... Individuality is the uniqueness of the history, of the career, not something given once for all at the beginning which then proceeds to unroll as a ball of yarn may be unwound. Lincoln made history. But it is just as true that he made himself as an individual in the history he made” (Dewey 1988/1938/40, 102-3. Cited in Mozur, 1991, 322-3).

a concept of temporality within Dewey's work from 1925 onwards has been established in considerable detail. Indeed, it has been observed by a handful of scholars, and they have attempted to chart its evolution and function throughout the various phases of Dewey's career. The existence and delineation of such putative phases, however – *pace* Helm – remains to be established.

Considering these works together, we are entitled to assert that temporality, for Dewey, is primarily characterized as relating to (1) a dynamic process, rather than a static, predetermined essence, quality, substance or attribute; and (2) a process which, in its *privileged* manifestation, arises via the interaction between a conscious, sentient organism⁵⁶ and its environment; but that this environment, being continuous with an ever widening expanse such that it incorporates all systems and regions which are susceptible to (a) the projection of consciousness; and (b) the laws of nature and physics, necessarily includes both organic and non-organic entities, including such elementary particles as atoms and molecules.⁵⁷ This because I take this process in its originary dimensions – both upon the plane of consciousness and those beyond it, down to the atomic level of the wider universe – to be characterized by what Dewey came to define as *rhythm* (*AE*, 169). For the purpose of my thesis, rhythm receives its fullest, most fruitful definition in *Art as Experience* (1934), where it is conceived both

⁵⁶ Mozur also considers how Dewey can legitimately be said to have extended the scope of temporality to include non-sentient elements of organic matter, such as particles, considered at the quantum level (1991, 328 onwards).

⁵⁷ Again, reasons of space do not permit me to explore the ways in which a conscious, sentient organism may or may not be held to occupy a privileged position in relation to Dewey's concept of temporality – especially in light of the *anthropic* principle prevalent in astrophysics and cosmology.

as “a matter of perception... [which] includes whatever is contributed by the self in the active process of perceiving”, *and*, significantly, that which exists as a “regularity of recurrence amid changing events” (*AE*, 169).

Considering Dewey’s 1934 treatment of the concept in the light of his later development of the concept of temporality (Dewey 1988/1938/40), *rhythm*, especially in its *vital* and/or *expressive* form (*AE*, 170), becomes crucial to our understanding of the ‘full scope’ and import of the concept of temporality (cf. Calore 1989, 22) in the following way. Dewey’s explication of this concept not only collapses the distinction between the traditional conceptions of time and space, but, in parallel with Heidegger’s emphasis on the prior significance of temporality (in relation to the concept of time), and Deleuze’s later treatment of his ‘realist ontology’, his abbreviated definition of *rhythm* as ‘ordered *variation* of changes’ (*AE*, 160 – emphasis mine) or ‘ordered *variation* of manifestation of energy’ (*AE*, 170 – emphasis mine), emphasizes the dynamic element within all aspects of the environment. To conceive of the environment and its constitutive factors as varying manifestations of energy highlights the continuous, monistic nature of existences, and thereby, in the manner of Dewey’s reformulation of the Reflex Arc concept, undercuts all hypostasized and traditional distinctions of substance, object, and so on. In a move that bears strong parallels with Deleuze’s philosophical project, by conceiving the environment in this manner Dewey not only establishes the dynamic nature of the environment, but, in so doing, shifts the traditional privileging of a spatial conception of existence – with its insistence on divisibility, order and calculation – within the sciences (and, with it, the common con-

ception of time)⁵⁸ to a situation whereby *temporality* (or temporal flow) becomes the privileged form of relation, not just to *reality* – conceived as the plane of our creative act of inquiry – but to all of what Heidegger would refer to as *Being*.

Accordingly, just as Heidegger can be seen to subvert the hierarchy wherein temporality is considered to derive from, and have less informative value than, the mathematically-scientific concept of time by deriving the latter from the former; Dewey, through his concept of *rhythm*: (1) attempts to establish that temporality constitutes the *form*⁵⁹ and *manifestation* of the varied instantiations of energy which constitute the full totality of existence (Being). This amounts to establishing the ‘full scope’ of the concept of temporality; and (2) seeks to demonstrate that temporality not only defines the form of existence at the micro level, or that which is strictly beyond the scope of consciousness (e.g. *AE*, 13-14. Cf. Mozur 1991, 328 onwards), but also defines the form of *any* historical career or manner of existence (e.g. *AE*, 14; cf. Calore 1989, 19 & 22). In this way temporality can be considered the basis for experience *per se*, and thus becomes a foundational concept in relation to the naturalistic investigation of experience and nature, particularly as it regards the notion of human experience, including those aspects of inquiry, understanding and learning.

⁵⁸ See Mckeon 1974, 126-7; Scott 2006, 184.

⁵⁹ E.g. “I emphasized the dependence of this final work [of art] upon the existence of rhythms in nature; as I pointed out, they are the conditions of form in experience and hence of expression.” *AE*, 169.

4.6 Dewey's educative process: The concept of 'growth' within *Democracy and Education*

My interest in examining the concept of growth as it is unfolded within *Democracy and Education* comes, in part, from a rejoinder by Dewey to those who sought to criticize the implications of his conception of that process. After considering these objections, Dewey says of growth, simply: "...the conception is one that must find universal and not specialized limited application."⁶⁰ There are many possible interpretations of the import of that sentence, but, for me, of particular significance is the relationship it forges with a wider tradition of naturalist philosophy, but most particularly with those projects which, in regarding life as an ongoing and dynamic process of becoming, seek to ground their ontology in concepts and notions adequate to the peculiar vitality of life as it is lived. For if we take a philosopher such as Gilles Deleuze, a central part of his philosophy of difference was the attempt to move away from the traditional philosophical procedure, which finds its archetype in Kantian transcendental idealism, whereby the tools of thought – about life, about ourselves, about our environment, about society – are secured by an abstract, transcendent and immutable conceptual basis which, necessarily, is fundamentally foreign to the dynamism of lived experience. As with Deleuze's project, so with Dewey's. It is, accordingly, the purpose of this paper to outline the nature of growth as perceived by Dewey within *Democracy and Education*, and trace its ramifications as they impact upon other concepts of importance within his oeuvre.

⁶⁰ Dewey, John. 1997. *Experience and Education*. New York: Simon and Schuster, p. 36

The importance of the concept of growth for Dewey is underscored not only by the fact that an entire chapter (Chapter 4) is devoted to its examination, but by the irrefragable link which is drawn between it and the concept of *education*. As befits such a fundamental concept, we are, early in the aforementioned chapter, given an explicitly temporalized definition of *growth* as 'This cumulative movement of action toward a later result' (*DE*, 41). It becomes obvious from the very word 'This' used at the start of the sentence that the definition is not sufficient as an informative statement unaccompanied by either context or further explication. Setting aside for the moment an examination of the key words *action* and *result*, the import of the definition is clarified if we turn to the preceding two sentences of the chapter, where we find a discussion of the nature of *society*, which is held to be determined largely 'upon the direction children's activities were given at an earlier period' (*DE*, 41). Of immediate significance is the link between the plural noun *activities* and the term *action*, both of which can trace their etymology to Latin stems denoting agency, particularly *agere* "to do". The employment in this way of two such terms, one as a central term within a crucial definition, the other as signal within the context of the definition, gives us a first indication of the importance of the notion of *agency* – or what might be termed *positive force* – within Dewey's philosophy, the full implications of which are only made apparent in the subsequent discussion of *immaturity*.⁶¹

⁶¹ Here *positive force* can be given the provisional definition as any unfolding of an act, impulse or movement such that it brings about an effect in a given environment.

Throughout this discussion, Dewey is at pains to differentiate between a deficient and an adequate definition of the word *immaturity*, going on to use the latter definition as a tool to reveal the underlying assumptions which render the former problematic for any plausible philosophy of education. Particularly problematic in this regard is the interpretation the prefix 'im' as denoting *lack* or *void*, this for the reason that the absence referenced by these terms necessarily implies an *ideal* or *standard* to which they are compared and found deficient. Such a standard, in this case, would seem to be the fully grown adult which exists as the end point – or finished product – of the process of growth. By importing this standard as the operant measure of development, such a view comes, by extension, to characterize growth as a systematic movement towards the realization of a pre-determined end state, which, in being pre-determined, is undergone by an organism in (largely) passive fashion. Aside from the fact that the systematic nature of this process reduces the possible function and role of freedom within its realization, it also minimizes the capacity of the organism involved in growth to realize differing and different potentialities. As against this view, Dewey is careful to assert:

"Now when we say that immaturity means the possibility of growth, we are not referring to the absence of powers which may exist at a later time; we express a force positively present – the *ability* to develop" (*DE*, 41-2).

In doing so, we must note that Dewey achieves two aims which will be of significance later in the work: firstly, he secures the basis for his conception of growth within the empirically verifiable dynamism of the ongoing life-process itself; and, secondly, in this way, he prepares the way for growth to play a fundamental role in determining education as a similarly dynamic process, and what is more, a process which is irreducibly linked to the conditions of life. But of importance for our present position within the text is this notion of *possibility*, and what this entails for the logic of Dewey's concept of growth.

For it becomes apparent that implicit within his description of immaturity as a state of *possibility*, and his subsequent connection of this condition with *positive powers*, that Dewey is attempting to construct an overall conception of growth which is radically different to that commonly received. The traditional perception of growth might accurately be said to emphasize a physical basis, and one in which the physical organism increases its size, strength or area through a process of cellular and muscular expansion. Second to the physical is the mental aspect, wherein growth is regarded as 'an approximation to a final and unchanging goal' of a the correct intellectual ability or state of mind, as, for example, when a child 'grows' as a student by supplying the correct answers to questions on taught subject matter. Yet, for Dewey, regardless of whether it is a matter of physical or mental growth, the process of its coming to fruition is characterized by an *active* and *motivated* engagement with the environment on the part of the organism. This same engagement, in altering the surrounding environment in a manner which, in turn, reciprocally affects the organism's possibility for

action (ideally in a positive way), thereby reinforces the impetus within the organism to repeat the process of motivated active engagement (*DE*, 44-5).⁶² The procedure by which this becomes possible relies on the fact that, according to Dewey, the nascent state of immaturity is defined by two traits, *dependence* and *plasticity*, the function for each being represented as an aspect of constructive power oriented towards the expansion of an organism's capacity (*DE*, 42).

Dependence, the first term, is usually perceived as a state of in-ability characterized by a basic passivity: that is, a state of helplessness. The nature of such a position would suggest that the organism, with time, would fail to develop at all; yet the fact that a sustained period of dependence within the human infant results in the emergence of a socialized being of multi-faceted capacities and powers suggests the *constructive* nature of the term (*DE*, 42). For it is the case that, in fact, the inherent mechanisms of maturation for a child may generally be perceived to act towards the *initiation* of socializing engagement with others, whereby a *sensitivity* to the means by which one creates, and then responds communicatively towards, attitudes within others comes to be the dominant mode of expression (*DE*, 43).

Underpinning, and, indeed, consolidating the effectiveness of this power is the capacity for *plasticity*, defined as 'the ability to learn from experience; the power to retain from one experience something which is of avail in coping with [later]

⁶² We will examine this point further under our examination of the concept of *habit*, below.

difficulties' (*DE*, 44). It is this power which may be said to provide for a structured deployment of the instinctive tendencies/reactions in relation to the surrounding environment. Not only this, but the power also retains a capacity of detachment whereby the results of deploying certain instinctual reactions, or combinations thereof, are lent a lasting mental significance, and, being thus memorized in relation to particular motor sequences, are stored in memory as informative guides (or cues, perhaps) to future action. Repeated testing and variation of the constituent impulses comprising such reactions as applied to the environment ensures a continuing flexibility within the propensity for intellectual and emotional disposition formation, a power which finds its full expression in the learning and acquisition of *habits* (*DE*, 44).

The concept of *habit* is crucial to a full understanding of the nature and implications of Dewey's concept of *growth*. Instead, once again, of habit existing as a relatively passive form of adaptation to our environment, it exists rather as a form of learnt 'executive skill' (*DE*, 46), one which denotes the capacity and the means by which an organism can utilize the environment to its intended ends. That is, it represents the capacity for an *active control* of the environment. Given that Dewey accepts a possible definition of *education* as 'the acquisition of those habits that effect an adjustment of an individual and his environment' (*DE*, 46), it becomes clear that the acquisition of habits not only sustains an organism's capacity for *learning* about itself in relation to its environment. For in employing a repeated and varied application of the intellectual element, the active operation of habits results in the continued maintenance of the capacity for elasticity within an organism's oriented disposition: a flexibility which, in

increasing the adequacy of our understanding of ourselves in relation to the changing environment, represents the chief condition of possibility for continued and consolidating growth.

Existing in this way as the dynamic process by which life, in its particular instantiation as an organism, co-opts the forces inherent within the environment such that they realize, and then expand, the potential nascent within an organism's structure, growth comes to be regarded in its essential basis as an open-ended tendency. As such, it operates within Dewey's philosophy as the conceptual basis whereby he can distinguish his theory from those of practitioners such as Herbart – 'Mind' as wholly formed by its externally presented contents (*DE*, 69–72) – and Froebel – development as 'the unfolding of a ready-made latent principle' (*DE*, 58) – whose theories he regarded as extinguishing the grounds for an intrinsically creative and positive conception of growth which is adequate to the developmental condition of life.

4.7. Dewey and temporality: A comprehensive reading

As per the primary contention of my thesis, regardless of the prevailing stage-based narrative of the evolution of Dewey's concept of temporality arising from the work of Helm (1985) and Richards (1972), a fully functional, if implicit, concept of temporality can be discerned within Dewey's work as early as his 1896 paper, *The Reflex Arc Concept in Psychology*.

Analysis of the nature of the ‘circuit’ put forward in that paper shows that, alongside other developments, Dewey’s reformulation of the reflex arc concept abandons the structure of a straightforward linear causal progression in the following fashion. The significance of the ‘circuit’, as Dewey explains, is that it is not comprised of distinct or disjointed parts which relate to each other in simply a linear causal manner. The circuit itself finds both its meaning and value in ‘the *mediation* of experience’ (*RCP*, 360 – emphasis mine) making it an occurrence in which the different aspects of the process derive both their function and significance ‘purely from the part played in maintaining or reconstituting’ (*RCP*, 360) the coordination *comprising* that experience.

For this to be the case, the circuit must proceed in a nonlinear manner. This is confirmed when Dewey states that the designated ‘last’ phase of the circuit (the burn sensation), represents the ‘completion’ or ‘fulfillment’ of the opening stage (*RCP*, 359). Thus the final stage not only ‘reacts *into*’ the opening stage (emphasis mine), but comes to reconstitute its sense, meaning and value such that an incidence of ‘learning’ occurs (*RCP*, 359). It is precisely in this manner, that of a circuit, that Dewey’s naturalistic method operates as the means to an informative analysis of experience.⁶³

Furthermore, a close reading of Dewey’s structural explication of the concept not only confirms this, but also provides the formulation of an initial outline for the concept of

⁶³ Cf. Hansen, 2004.

temporality underlying the operation of his reflex arc circuit, and, by implication, other psychological processes within the human organism.

The key statements in this regard center on two of Dewey's crucial claims: (a) that the determination of the 'sensory stimulus' or 'motor response' status of occurrences is related to the conscious awareness of a 'problem' concerning how to act within a given situation⁶⁴; and (b) that the 'stimulus' and 'response' phases are 'strictly *correlative* and *contemporaneous*' (*RCP*, 370 – emphasis mine).

With regard to (a): Dewey's positing of a unifying principle underlying the reflex arc renders consciousness central to the stimulus/sensation-response/movement problematic. Dewey collapses the distinction between the stimulus/sensation-response/movement phases of the arc by showing they are not 'distinctions of existence', but rather 'teleological distinctions, that is, distinctions of function... with reference to or maintaining an end' (*RCP*, 365). This reformulation effectively changes the structure of the coordination in two ways: (1) by removing the need for the arc to preserve distinct categories, linked by a linear relationship of cause and effect⁶⁵, and dependent upon correspondence to discrete external objects for their validity and continued separation; and (2) by transferring the locus of the reflex arc's dynamic to the projection of teleological consciousness, Dewey requires that the meaning/value of each phase be de-

⁶⁴ Hence: "The circle is a coordination, some of whose members have come into conflict with each other. It is the temporary disintegration and need of reconstitution which occasions, which affords the genesis of, the conscious distinction into sensory stimulus on one side and motor response on the other" (*RCP*, 370).

⁶⁵ E.g. the (sensory) stimulus-as-light causes the (motor) response-as-reaching, etc.

rived *retroactively*, and solely as a matter connected with the interpretation of a phase's function in accomplishing the projected *telos* of that same situation. Thus, no longer existing as a particular physical or psychical identity by itself (*RCP*, 368), each occurrence within the arc – whether sensation, stimulus, movement or response – ‘has no fixed quality of its own’ (*RCP*, 368-9). That is, each becomes co-extensive with the others as a mere act, the value/meaning of which, as a matter of situational interpretation, is necessarily both contingent and transferrable. Put another way, we might say that the ‘coordination’ of the arc is demonstrated in this way to be both dynamic and self-organizing. It is only in this regard that we can make sense of Dewey’s statement that ‘one and the same occurrence plays either or both parts [sensation and/or stimulus, movement and/or response], according to the shift of interest’ (*RCP*, 364).

That this has implications for the structure of temporality underlying the coordination is confirmed by Dewey’s second claim⁶⁶: that stimulus and response phases are ‘strictly correlative and contemporaneous’. Consequently, we are entitled to use it as the basis of our attempt to discern the outline of the concept of temporality within *The Reflex Arc* essay.

For the purposes of our full explication of the concept of temporality, it is essential to remark that Dewey terms the phases of the arc ‘contemporaneous’ *because* they are also ‘correlative’. The definition of ‘correlative’ here is ambiguous, split between

⁶⁶ That is, claim (b), above.

meaning “Having a reciprocal relation such that each necessarily implies, or is complementary to, the other” and “Related in the way of analogy, similarity; corresponding, analogous.”⁶⁷ The latter definition, with the emphasis on things being ‘analogous’, renders the phases *logically* equivalent to one another⁶⁸, a move which, in removing any inherent quality upon which a predetermined linear causal order may be premised, requires that each factor be susceptible to the simultaneous projective determination of attention, itself continually open to revision, reorganization and reconstitution. That is, each factor, as defined by Dewey, must be both dynamic and self-organizing. It is only on this basis that Dewey can claim:

“Now the response is not only uncertain, but the stimulus is equally uncertain... The real problem may be ... stated as either to discover the right stimulus... or to discover... the response.” (*RCP*, 367)

Given the similarities in terminology usage – compare the aforementioned terms ‘uncertain’ and ‘problem’, with Dewey’s later use of ‘doubtfulness’, ‘unsettled’ and ‘disturbed’, for example (cf. Dewey 1938, 105; Richards 1972, 60) – it is fruitful at this stage to recognize the emergence of a significant overlap between this early statement of Dewey’s psychological theory, and his later theory of inquiry, as stated in his 1938

⁶⁷ University of Oxford Press. Definition for ‘correlative’, entries 1 & 3. Oxford English Dictionary (Second Edition). Retrieved from <http://www.oed.com/view/Entry/41936>

⁶⁸ A conclusion warranted by Dewey’s use of the functionalist model, wherein “sensation as stimulus does not mean any particular psychological existence. It means simply a function, and will have its value shift according to the special work requiring to be done. At one moment the various activities of reaching and withdrawing will be the sensation... At the next moment, the previous act of seeing will furnish the sensation...” (*RCP*, 368).

work *Logic: The Theory of Inquiry*. As noted by Richards (1972, 60), Dewey proceeds from the premise that ‘The first phase or condition of inquiry is the engagement of the human organism in a situation which is pre-cognitively experienced as unsettled and disturbed’, one that, in Dewey’s words, is pervaded with a ‘unique doubtfulness which makes that situation to be just and only the situation it is (Dewey 1938a, 105).

The feeling of uneasiness generates the second phase of inquiry, what Richards calls ‘the cognitive apprehension of the problematic of the situation’ (1972, 61). With the shock of the breakdown of habit, ‘inquiry is underway’ (*ibid.*). If we examine this immediate situation of broken habit and immediate inquiry within the temporalized terms of the Reflex Arc, it would appear that the putative cognizance of specific factors within the situation of the *present* scene elicits an expectation/anticipation (that is, a projective, *futural* mode of circumspection) which derives from the dynamics of the neural patterns/attractors created by the *past* actions of the perception-action system. Borrowing some present-day terminology from Deleuze’s philosophy, it is the nature of ‘attractors’ within the brain to govern what happens next, via the futural sense of *expectation*, but because these have been inappropriately applied/misapplied to the present scene/task at hand, a discrepancy between expectation and observation has resulted in a perturbation of the system. In this scenario, the ‘doubt’ surrounding the next act creates what we might term ‘a non-specific’ energy which *self-organizes* to the extent of increasing the likelihood of either a predominant behavior

pattern, or else a changed organization of behavior.⁶⁹ This non-specific energy thus provides, according to the Dewey of *The Reflex Arc*, ‘a motivation to attend to what has just taken place; to define it more carefully’ (*RCP*, 368), in the service of reconstituting the interpretative expectation. In the terminology of his later theory of inquiry, this ‘motivation’ to ‘attend’ to the scene, and provide a more careful ‘definition’, represents the moment at which *inquiry* is embarked upon, or set underway. In a manner reminiscent of his later, temporalized theory of inquiry, it also confirms the dynamic and necessarily self-organizing capacity of the arc’s ‘coordination’, in terms of the logic of Dewey’s psychological theory, stated as early as 1896.

According to Richards (1972, 60), ‘Dewey takes his theory of inquiry to be fundamentally an articulation and refinement of scientific method... The discovery of the method of inquiry... [was also] a critical discovery of the way in which thinking is actually carried on, the way in which thought takes place and knowledge is secured.’ In the light of the foregoing, it becomes apparent that the comparison between the theoretical framework Dewey exhibits in his Reflex Arc paper (1896), and that of his theory of education – especially as it is outlined in both *Democracy and Education*, and his concept of inquiry (in Dewey 1938a) – might provide a detailed indication of the presence of an operational concept of temporality. The key points of focus thus center on (1) the role of what Dewey terms ‘function’ as it is regarded in relation to what also may be termed, in light of Dewey’s essay ‘Events and the Future’,

⁶⁹ Following *RCP*, 368.

‘context’⁷⁰; (2) the dynamic nature of cognition; (3) the (future-oriented) concepts of ‘anticipation’ and ‘expectation’; and, relatedly, (4) the significance of what we might call, in line with the discipline of thermodynamics, ‘a perturbation of the system’ in relation to Dewey’s notions of ‘conflict’ and ‘uncertainty’.

When Dewey terms sensation-as-stimulus a ‘function’ he means that its status is simply that of an undetermined factor within a coordination of factors, though it is a factor whose value will become determined in the light of the aim which attention projects upon the situation.⁷¹ The function of a factor thereby becomes determined via a temporalized interrelation between the projective attention of the organism and the features of the present situation it considers significant. Thus function for Dewey operates as the correlate of what we might describe – following development of this concept in various scientific and psychological disciplines – as a process of ‘self-organization’, which arises from the interrelation of motor and neural subsystems and the salient constraints of the perceived context, a (temporalized) process which arrives at stability in the effort of coordination, allowing the demands of the task at hand to be successfully negotiated.

⁷⁰ Dewey, John. 1926. "Events And The Future," *The Journal of Philosophy*, 23.10 (hereafter *EF*).

⁷¹ This will be considered in greater detail when we consider the relations between Dewey and Deleuze’s philosophy in Chapter 5, below. Cf. *RCP*, 368: "... [S]ensation as stimulus does not mean any particular psychical existence. It means simply a function, and will have its value shift according to the special work requiring to be done." It should be noted, here, that I will use the terms coordination and situation as interchangeable within this thesis.

Similarly, Dewey's emphasis on attention's role in being able to 'shift' (determine) the value of a perceived factor of the situation in relation to a projected *telos* underscores the necessarily dynamic nature of the system including perception and mental activity (cognition). The fact of this dynamism is confirmed by Dewey when he states that the distinction between stimulus and response arises *retroactively*, and only courtesy of the projection of a *telos* onto the situation – thereby rendering the distinction a matter 'of interpretation.'⁷² In this way, Dewey's prioritization of attention within the act of seeing directly conforms to what would typically be defined as 'dynamic cognition'.

It is here that the importance of the underlying concept of temporality becomes apparent, both for Dewey's psychological theory, and to the related theory of learning. In defining cognition as necessarily dynamic, Dewey's psychology *must* incorporate within the psychological systems and processes connected to cognition an element capable of conceiving 'future' action as it relates to the immediate situation/context.⁷³

Accordingly, we find within Dewey's 'sensori-motor coordination' (*RCP*, 361) the requirement that there is an 'anticipatory sensation' or 'image' of the movements made possible by the situation, accompanied by a sense of their respective values,

⁷² *RCP*, 366 : "It is only the assumed common reference to an inclusive end which marks each member off as stimulus and response, that apart from such reference we have only antecedent and consequent; in other words, the distinction is one of interpretation."

⁷³ In addition to Dewey's notion of the projective teleology of attention, mentioned above.

‘before attention will go to the seeing to break it up as a sensation of light... of a particular kind.’⁷⁴

Similarly, we find that in regard to a key feature of Dewey’s psychology and the emerging understanding of dynamical systems theory in present-day cognitive science, there is not only a direct correlation, but that the comparison of both engenders a subsequent discovery which supplements Dewey’s original statement of his Reflex Arc theory. This is because a key aspect of Dewey’s coordination (i.e. his reformulated reflex arc concept) is that, just as with his theory of inquiry, the significant phases become conscious as a factor of attention because a perceived ‘conflict’ within the coordination induces a sense of ‘uncertainty’ about how to complete it.⁷⁵ Dewey’s notion of uncertainty thus becomes what we might now call ‘perturbation’, with Dewey’s notion of conflict becoming coextensive with a modern day concept of *discrepancy* in the environment. A full statement of this position by a representative of the current field of nonlinear dynamics within developmental psychology, both confirms the correlation, and introduces the new element of a ‘self-organized’ and ‘non-specific energy’, itself the very model of a necessarily *dynamic* cognition:

⁷⁴ *RCP*, 368 (emphasis mine). That the organization of the futural element of anticipation occurs before the final determination of the (putative) initial stimulus is instructive for our later explication of the concept of temporality. Here it is sufficient to note that it confirms the nonlinear nature of both Dewey’s reflex circuit, as well as any temporality that connects with this.

⁷⁵ *RCP*, 368: “The sensation or conscious stimulus is not a thing or existence by itself; it is that phase of a coördination requiring attention because, by reason of the conflict within the coördination, it is uncertain how to complete it.”

“One important requirement... is that a discrepancy between expectation and observation results in a perturbation of the system. It has long been known from studies of both human and animal behavior that within a given context, several types of objective environmental change (discrepancies) result in creation of nonspecific energy, which is then self-organized in the sense of increasing the likelihood of occurrence of the predominant behaviors... or change the organization of behavior. (Metzger 1997, 64.)”

A more succinct description of the conditions and initial structure of a thoroughly temporalized act of *inquiry* could hardly be imagined. Furthermore, the grounds for a re-examination of Dewey’s early psychological work, especially in the light of its incipient theory of temporality, are also established. The fact that Dewey’s psychological theory, via consideration of the concept of temporality, remains relevant and adequate to a present-day philosophy describing the functioning of the brain, thought processes and the understanding, is more than enough reason to pursue this line of thought in a more comprehensive fashion as part of a doctoral dissertation.

4.8. Summary

From the foregoing it has been established that a concept of temporality does exist throughout Dewey’s work, in both explicit and implicit form. The explicit form of the concept receives treatment in the signal works from *Experience and Nature* (1925) onwards, with perhaps its cardinal statement in the 1938/40 piece ‘Time and Individuality’. It has also been established, however, that an implicit and innovative conception of temporality can be discerned as far back as Dewey’s 1896 reformulation of the

reflex arc concept in psychology. Both items are of significance for my proposed thesis inquiry because it is my contention that this extant concept of temporality: (1) is the grounding or foundational concept required for the possibility of an adequate concept of *experience*⁷⁶; and (2) an adequate understanding of the learning process is not possible without an adequate concept of experience. If this can be shown, it is then hoped that explication of this grounding, or foundational role, will better allow the work of educational philosophers to deal adequately and in a structured manner with the everyday ‘content’ or ‘substance’ of the terms ‘learning’ and ‘inquiry’ as they are considered in relation to educative experience.

Relatedly, with regard to the notion of the ‘learning process’ as it functions within a putative educative process: it is proposed that Dewey’s concept of temporality, in both explicit and implicit forms, suggests that we abandon a conception of the learning process as comprising anything amounting to a causally linear, straightforwardly sequential course. Analysis of Dewey’s concept of temporality, and the ways in which it both links with, and corroborates, recent studies of the learning process premised on temporally asymmetric, nonlinear lines – e.g those premised on a spike-timing-dependent Hebbian mechanism, or the philosophy of Gilles Deleuze (explored in Chapter 3) – will enable us to determine that Dewey’s theoretical positions, as he stated

⁷⁶ That is, it is a necessary condition for experience to occur.

them, have both a proven informative value and continuing relevance in relation to current fields of inquiry within educational theory more broadly conceived.⁷⁷

This last will be consolidated through an explication of Dewey's own theory of *learning*⁷⁸ – as it is outlined in his 1916 work *Democracy and Education* – which will be shown to employ the nonlinear, temporally asymmetric concept of temporality established above. It is hoped that this will then provide the means by which to link the theoretical and conceptual work of philosophers of education in general, and John Dewey's work in particular, in a more adequate and concrete fashion to the issues and concerns of the current field of education, particularly as it relates to the notion of learning within and beyond the classroom.

⁷⁷ In this regard it should be noted that 'the commonly received processes of learning' may be found inadequate, premised as they are on a causally linear, sequence-based, or temporally symmetric notion of experience through time. See, e.g. McClintock, R. 2012, page 58 onwards; Dewey's reformulation of the 'Reflex Arc' concept, below; and work on learning arising from Hebb's. D. O. 1949, e.g. Rao, R. P. N. & Sejnowski, T. J. 2001, and Gutig. R. Aharonov. R. Rotter. S. & Sompolinsky. H. 2003.

⁷⁸ I will use the terms 'learning' and 'inquiry' interchangeably unless specified.

Chapter 5

Dewey's concept of temporality: Implications for the current field of education

Part I: Theory

5.1. Kant, Heidegger, Deleuze and Dewey: A recapitulation

In the previous chapters, we saw how Kant provided Dewey, Heidegger and Deleuze with the idea and demonstration that (1) time is interwoven in our experience, our lived world, and our being as humans; (2) the need for an underlying (*transcendental*, in Kant's term), determinative object 'x' (the noumena), which must structure our thoroughly temporalized experience (this structure becomes 'rhythm' for Dewey, as we saw in Chapter 4, Section 5; *Being* for Heidegger, especially as it comes into relation to Dasein's 'horizon'⁷⁹; and 'the virtual' for Deleuze). That we were justified in doing so is confirmed by Heidegger's remarks, in *Being and Time*, that "The first and only person who has gone any stretch of the way towards investigating the dimension of Temporality or has even let himself be drawn hither by the coercion of the phenomena themselves is Kant" (*BT*, 45/H23).

But Heidegger goes on to point out, however, that there are significant problems with Kant's presentation of time and temporality, going so far as to acknowledge that within *Being and Time*, "we shall show why Kant could never achieve an insight into the problematic of Temporality" (H23). The problems Heidegger found to stand in the way of Kant gaining such an insight were twofold, the main one for our purposes being that:

⁷⁹ For an insightful and persuasive account of how Heidegger's reading of Kant establishes *horizon* as the form of Dasein's relation with being (and thus the equivalent of Kant's notion of *transcendence*), see Golob 2013.

“Furthermore, in spite of the fact that he [Kant] was bringing the phenomenon of time back into the subject again, his analysis of it remained oriented towards the traditional way in which time had ordinarily been understood; in the long run this kept him from working out the phenomenon of a ‘transcendental determination of time’ in its own structure and function.” (H24)

Given that we wish to examine the ways in which temporality - especially as it is found within Dewey’s early work - exists as a radical departure from the ‘traditional way in which time had ordinarily been understood,’ that in itself is a pressing reason why we acknowledge the foundation for our study laid by Kant, but turn our attention to the later philosophers. Indeed, it is here, too that we must take our leave even from Heidegger: this for the reason that, though he has provided the most decisive ground for our study - that in which temporality as a discrete and viable concept, one which can be fruitfully examined on its own terms, has been distinguished from the concept of time - his philosophy is most (self-)avowedly not based upon naturalistic grounds. Given one of the aims of this thesis is to examine the way in which the concept of temporality within Dewey’s work - and, by extension, that of Deleuze - is based upon naturalistic foundations, and therefore compatible with current findings in, among other fields, both neuroscience and psychology, then it becomes clear that from here onwards we must instead confine ourselves to presenting a nuanced, detailed explication of the concept of temporality as it is provided by Dewey, and also by Deleuze.

Furthermore, for Dewey and Deleuze at least, Kant’s philosophy must be rejected for its hypostatized distinctions, divisions, and teleologically determined aspect. Dewey

and Deleuze would counter, for example, that experience, our being, and the world, are interactive and open-ended phenomena.⁸⁰

For, according to one reading, the Kantian system can be seen as analogous to the Second Law of Thermodynamics, i.e. as a closed system that is isolated from its environment, and thus susceptible to being ‘run down’ as entropy increases. We draw the legitimacy of this reading from several remarks Dewey makes about Kant’s philosophic method in his 1884 monograph on that subject, particularly:

“Though the categories make experience, they make it out of a foreign material to which they bear a purely external relation. They constitute objects, but these objects are not such in universal reference, but only to beings of like capacities of receptivity as ourselves. They respect not existence in itself, but ourselves as affected by that existence. The system of categories furnishes the criterion for all the knowledge we have, but this turns out to be no real knowledge.” (Dewey 1884, 166-7)

On Dewey’s reading, then, the categories, as a system counted over against experience, comprise of an ‘abstracted’ - a loaded word in Dewey’s lexicon⁸¹ - pole of a du-

⁸⁰ Needless to say, Heidegger would reject this interpretation of Kant’s philosophy. Indeed, his 1927/8 lecture course “Phenomenological Interpretation of Kant’s Critique of Pure Reason,” along with his 1929 essay “Kant and the Problem of Metaphysics” go to the extent of providing a ‘violent’ reinterpretation of Kant’s project to establish (at least), in Golob’s words, that 1: “Time thus plays both the role allotted to it by mainstream Kantians and that traditionally reserved for the understanding; as Heidegger puts it, ‘time is the schema-image and not just the form of intuition’ . . . ; and 2: “Heidegger believes that this violence [of his re-reading] is not arbitrary but that in unearthing the link between the Schematism and the concept of a horizon he has exposed the ‘concealed, inner passion’ of Kant’s thought” (Golob 2013, 364-5). It is beyond the scope of this thesis to explore Heidegger’s reading of Kant, our primary purpose being to explicate Dewey’s early concept of temporality, with a secondary purpose of exploring the links and parallels it bears with Deleuze’s concept of time. Heidegger’s role here is thus restricted to 1. establishing temporality as a concept distinct from time; and 2. thereby providing western philosophy with legitimate and comprehensive grounds for a distinct strand of temporal philosophy (of which Dewey’s thought plays a significant part).

⁸¹ See Winther 2014 for an analysis of Dewey’s consideration of both the dangers and merits of ‘abstraction’, especially as it relates to his (necessarily negative) notion of ‘*the philosophic fallacy*.’

alism (or binary) set over and against the foreign, unknown substratum of experience. Indeed, by contrasting the a priori nature of the categories (as form) against the a posteriori nature of experience (as content), Kant, on Dewey's reading, renders the categories as universal, unalterable and infallible, regardless of whatever the unfolding of experience offers. Read from the perspective of Dewey's interactive, non-dualistic and transactional philosophy, the Kantian a priori/a posteriori dualism becomes an entirely artificial philosophical projection, as well as the basis of an unnecessary philosophical 'problem' concerning how we can be said to validate and legitimate what we call knowledge, based as it is on our experience. Indeed, as noted in our comments on the confusion surrounding the concept of time throughout history (Introduction to Chapter 2, below), the Kantian a priori/a posteriori dualism, erected as it is on the table of the Categories, can be held largely responsible for determining the tenor of much of the subsequent investigations of time; those investigations seemingly being more concerned to preserve the logical consistency of the abstract concepts related to time (such as the Categories), rather than exploring and establishing time's adequacy to experience.⁸²

As such, the abstracted and artificial nature of the Kantian a priori/categories-a posteriori/content dualism bears a strong parallel with the nature of the original, inadequate

⁸² Cf. (1) "Since the categories, in and through self-consciousness, constitute experience, Method will consist in making out a complete table of these categories in all their mutual relations, giving each its proper placing, with the full confidence that when so placed each will have its proper place in experience, i. e., its capacity for expressing reality determined." Dewey 1884,166; and (2) "Hence, it appears that our picture of a method was doubly false - false in that after all it could not reach truth; false in that after all no such method was in itself possible. Our organic system of categories cannot constitute absolute truth - and no such organic system is itself knowable. Criterion and method we are still without. The golden prize, which seemed just within our hands as long as we confined ourselves to the Transcendental Logic, turns out to be a tinsel superfluity." *Ibid.*, 167.

'Reflex Arc Concept' which, as we saw in the previous chapter, through its illegitimate partitioning of aspects of an experience into such items as 'sensation' and 'idea', 'stimulus' and 'response', erects through the backdoor dualisms which render the reflex arc itself entirely incapable of evincing the dynamic, contextual and interactive nature of a phase of experience.⁸³

For Dewey and Deleuze, on the other hand, all systems are open-ended and interrelated, and not necessarily susceptible to entropy in the same manner as with the Second Law of Thermodynamics. Indeed, open systems allow for the exchange of energy, matter and entropy across boundaries, making it possible to simultaneously satisfy nature's desire for an increase in entropy and yet have an increase in complexity and organization at the same time.

It will be the purpose of this chapter, then, to explore the nature of the 'open' concept of experience which Dewey's work exhibits, particularly as it is both structured and made possible by Dewey's novel concept of temporality. As we proceed, the overlaps between Dewey and Deleuze's philosophies will be explored, as will the contemporary science, explicated by Manuel DeLanda's careful exposition of Deleuze's work in *Intensive Science and Virtual Philosophy*, which serves as the naturalist foundation from which both Dewey and Deleuze's work proceed. As an illustration of each of these aspects, as well as the potential Dewey's concept of temporality holds for educative inquiry, we will then construct a reformulated concept of temporality, which

⁸³ Winther agrees that the parallel drawn between Dewey's criticisms of the Reflex Arc and those of Kant's philosophic method is highly both legitimate and instructive. See Winther 2014, 14-15.

will be taken from what is implicit within Dewey's work in *Democracy and Education*.

5.2. Introduction

From the foregoing examination of both Kant's transcendental idealist explication of the conditions of experience in general, and his conception of the crucial role time plays in making experience possible in particular, we are entitled to conclude that Kant's philosophy lent much to the construction of Dewey and Deleuze's own concepts of time and temporality. But those debts now remarked upon in detail, it is the purpose of this present chapter to consider the significant departures from Kant's work made by Dewey and Deleuze individually, before exploring the prevalent affinities and overlaps shared between Dewey and Deleuze's conceptions of temporality and time. Stated directly, the project of this chapter is to suggest that: (a), contrary to the superficial appearances intimated by any putative divide between 'continental' and 'analytic' philosophy, Dewey's concept of temporality not only exists within a distinct tradition of temporal-based philosophies such as those presented by (but not limited to) Henri Bergson, Martin Heidegger and Gilles Deleuze; it, in fact (b), from *The Reflex Arc Concept in Psychology* onwards, constitutes one of the earliest statements of such a conception. Furthermore (c), with the concept of temporality in the *Reflex Arc* existing as a significant departure for this tradition in its own right, it represents a concept of temporality which Dewey continued to refine and enlarge such that it came, eventually, to provide a framework for temporality which exhibits a strong and detailed parallel to that taken-up by Gilles Deleuze and re-applied to late twentieth century scientific and philosophical thought. This being the case (d), the reconceived

concept of temporality which this chapter seeks to construct - via the combination of Dewey and Deleuze's work on this same concept - is one that not only underlies much current philosophical, neuro-biological and psychological work on the preconditions required for the possibility of educational experience, but one that provides the outline for a significant departure in considering anew particular issues that may be seen to present an obstacle to the full and proper fruition of such educational experience.

5.3. Dewey and Deleuze: The concept of temporality reformulated

We saw in Chapter 4, above, that Dewey's 1896 reformulation of the Reflex Arc concept in psychology provides the basis for a full and significant concept of temporality to be explicated. This concept not only represents a significant departure from the concept of temporality which underlies the previous formulation of the Reflex Arc concept; it also foreshadows to a highly detailed degree Dewey's development of his concepts of time and temporality throughout his career, and particularly his mature statement of the concept of temporality from *Experience and Nature* (1925) through to his full statement of the concept in *Time and Individuality* (1938).

That this should be so cannot simply be taken upon faith or assertion, however. But that significant overlaps do exist between Dewey's 1896 conception of temporality and that developed in *Experience and Nature* is evidenced repeatedly throughout the latter work, most particularly perhaps in the detailed re-statement of the temporal structure of the reformulated Reflex Arc in 'Chapter 7: Nature, Life and Body-Mind.' One section, spanning pages 256-8, exists not merely as a nuanced statement of Dewey's mature concept of temporality, but also exhibits the deployment of several

concepts which provide the foundation for a fruitful link with the concept of temporality advanced by Gilles Deleuze, and so deserves to be unpacked at length.

5.4. A naturalistic foundation for temporality: Dewey's concepts of *sensitivity* and *susceptibility*

At this point in the analysis, it is informative to recall something of the distinction between time and temporality: namely, that time might be seen, following Heidegger, as derivative of temporality, and as a derivative form of it which is stripped as much as possible of its meaningful content. Temporality, in this way, might be seen to constitute a richer, experiential mode of dynamism whereby an imminent process, coordination or whole organism unfolds or actualizes aspects of its potentiality in interaction with its environment.⁸⁴ The crucial terms here are *imminent* - in that all such processes always already exhibit a spontaneous and internal organization; and *dynamism* - in that such organization as is exhibited by any process can only realize the full nature of its individual capacities through actualizing these potentialities within a wider nested field of interrelated processes - what we might term a local 'environment' - which themselves part of wider nested fields (thus part of a wider environment on a more expansive scale). Following our analysis of *rhythm* (Chapter 2), and Dewey's related remarks in other works (e.g. *EN*, 110-11, *AE*, 13-14, 169-70. Cf. Mozur 1991, 328 onwards), we are entitled to hold that this characterization of temporality applies not just to sentient organisms - though it is admitted that Dewey is clear that these constitute the most privileged example (e.g. *EN*, 253-4, discussed below) - but to all organized patterns of activity, even down to the sub-atomic level. For, when we remove

⁸⁴ Cf. the distinction between 'temporal quality' and 'temporal order' at *EN*, 110-11. Also cited and discussed in Chapter 2, below.

our human tendency to attribute a temporal nature only to sentient beings, we find a picture of dynamic nature in which a unique temporal career can be detected in processes and patterns of organization found at every level, between the fastest vibrations of subatomic particles at the micro-level, to the farthest extent of the macro level as it is found in the extremely long life cycles of cosmic bodies (DeLanda 2004, 106).

Despite extending the scope of temporality to the historical career of inanimate bodies, however, Dewey does go on to draw a distinction between the latter and animate bodies. Thus, while we may say of any organized process - the physico-chemical activity of an iron molecule, for example, compared with that of a plant (*EN*, 253-4) - that it displays the capacity, once its inner equilibrium is disturbed, to interact with its surroundings such that a cycle of changes is effected, terminating only when equilibrium has been restored, there is, for Dewey, nonetheless a difference in the *consequences* to be observed between the physico-chemical operations in the iron molecule and the plant. The difference, in Dewey's terms, amounts to the capacity for *sensitivity*. Thus,

“When ever the activities of the constituent parts of an organized pattern of activity are of such a nature as to conduce to the perpetuation of the patterned activity, there exists the basis of **sensitivity**. Each “part” of an organism is itself organized, and so of the parts of a part. Hence its selective bias in interactions with the environing things is exercised so as to maintain *itself*, while also maintaining the whole of which it is a member...” (*EN*, 253-4: emphasis mine).

In the case of the plant, the capacity for sensitivity determines that the organized activities of the component parts - each forming a component part of a nested whole - act in order to maintain the integral system to which they belong: namely, the overall organism of the whole plant. In the case of the iron molecule, while organized activity subsists, it has no such capacity for sensitivity. That is to say, any interactive activity or bias in the service of restoring equilibrium does not include a bias in favor of remaining within the system of organization which is integral to iron: 'it had just as soon, so to speak [in its interactions with water], become iron-oxide' (*EN*, 254).

Sensitivity, on this interpretation, exhibits the key factors of temporality identified between Heidegger and Dewey: (1) the past of the organized pattern of activity is here represented by both the *facticity* of its component parts: that is, by the given materials and capacities which are imminent to it, as well as the previous existence of patterns of response which are available to for the system to deploy; (2) the future is represented by the projection of a *means-ends* structure, or 'horizon', which is circumscribed and defined by an identifiable organization of activity - itself comprised of the variations on the response patterns and modes of reorganization available to it - which the entire system is set-up to to maintain beyond the present; and (3) the present is defined and qualitatively characterized by the deployment of bias in selecting interactions with the environment which are best suited to the continuation of that same organization of activity - that is, the present and future maintenance of the unique historical career which comprises the discrete, organized pattern of activity under consideration.

Both the fully temporal nature of *sensitivity*, as well as its consequent status as a precondition of experience, is further underlined by its correlate, *susceptibility*, which is defined, in decidedly ‘experiential’ terms as ‘the capacity of feeling’:

“This pervasive operative presence of the whole in the part and of the part in the whole constitutes **susceptibility** - the capacity of feeling - whether or no this potentiality be actualized... Responses are not merely selective, but are discriminatory... This discrimination is the essence of **sensitivity**. Thus with organization, bias becomes interest, and satisfaction a good or value and not mere satiation of wants or repletion of deficiencies” (EN, 256 - emphasis mine).

Not only does this once again underline the temporal nature of the organism under scrutiny. By now it is easy to appreciate the means-ends structure that susceptibility both realizes and makes possible: after all, we saw with the concept of *sensitivity*, above, that such a structure is simultaneously defined by the historically determined materials and capacities of the organism, its futural adaptive capacities (which relate to Heidegger’s notion of facticity), as well as the materials and potentialities peculiar to the environment in which the organism is located (which relates to Heidegger’s notions of ‘thrownness’). But what also emerges here, with susceptibility, for the first time is a sense of the structure of the temporal preconditions peculiar to an idea which is rightly seen as central to Dewey’s work, namely: that of the ‘educative’ moment, or experience.

5.5. The temporal preconditions of the educative moment

Before we analyze the nature of the temporal structure of the educative experience, we must briefly describe the process by which *susceptibility* and *sensitivity* yield the preconditions of educative experience for Dewey. We saw, in our Chapter 4 discussion of *growth*, how Dewey accepts a possible definition of *education* as 'the acquisition of those habits that effect an adjustment of an individual and his environment' (*DE*, 46). From this statement it becomes manifest that the acquisition of habits not only sustains an organism's capacity for *learning* about itself in relation to its environment. For in employing a repeated and varied application of the intellectual element, the active operation of habits results in the continued maintenance of the capacity for *elasticity* within an organism's oriented disposition: a flexibility which, in increasing the adequacy of our understanding of ourselves in relation to the changing environment, not only represents the chief condition of possibility for continued and consolidating growth, but also the enlargement and refinement of our *sensitivity*, itself an aspect of our capacity for *feeling* (i.e. *susceptibility*). Furthermore, by both enhancing our understanding of the mutual interrelations between ourselves and our environment, and thus our capacity for growth, we thereby gain a more nuanced understanding of which patterns of behavior and response to our environment are more beneficial, salubrious or effective in relation to any given aim, a process which further refines the nuanced nature of our feelings (*susceptibility*). It is in this way that our responses become more 'discriminatory', or *sensitive* (to our own conditions and those of the environment); and with refined discrimination comes an increased capacity to accurately predict the consequences and ends of actions and sequences, thereby enabling ourselves, through organized action, to project our preferences for certain

results onto the environment, using it as a tool to secure these. It is thus that a previously gross aspect of feeling or sensitivity - namely, an unreflective 'bias' or opaque 'preference' for a state of affairs to occur - evolves into an active *interest*, or that process by which we use our own discriminating and organized agency to secure the outcomes which our enhanced capacity for susceptibility leads us to discern to be best or most good for us: in short, those outcomes which exist as *values*.

That this describes the elements which combine to eventually comprise a more conscious apprehension of educative endeavor or activity can be seen when Dewey describes consciousness in detail:

“[E]very situation or field of consciousness is marked by initiation, direction or intent, and consequences or import. What is unique is not these traits, but the property of awareness or perception. Because of this property, the initial stage is capable of being judged in the light of its probable course and consequence. There is anticipation. Each successive event being a stage in a serial process is both expectant and commemorative. What is more precisely pertinent to our present theme, the terminal outcome when anticipated (as it is when a moving cause of affairs is perceived) becomes an end-in-view, an aim, purpose, a prediction usable as a plan in shaping the course of events” (*EN*, 101).

What is striking, here, is that in addition to describing the coming-to-consciousness of an increasing capacity for susceptibility and sensitivity, these elements are also taken-up into a new and refined conception of *perception*. Dewey's notion of perception, as he is at pains to show in two complementary sections, between pages 317-327 and 332-339, of *Experience and Nature*, is fundamentally different from either the restricted sense of it as purely 'sense-perception' (*ibid.*, 332), or the notion that it denotes 'simple original perceptions' of stimuli (*ibid.*, 335 & 336) or a given 'original

datum' (*ibid.*, 338). Instead, Dewey's conception of perception, in line with his analysis of 'seeing' (into) within his 1896 *Reflex Arc* paper (Cf. *RCP*, 368), conceives of perception as a much more active occurrence, one amounting to a thoroughly dynamic cognition:

“We are *observantly* aware (in distinction from inferentially aware) only of what *has* been done; we can perceive what is there, what *has* happened. By description, a stimulus is not an object of perception, for stimulus is correlative to response, and is undetermined except as response occurs... we are aware of the stimuli only in terms of our response to them and of the consequences of this response” (*EN*, 336-7)

Accordingly, when we realize that *susceptibility* and *sensitivity* are intimately bound-up in any act of *perception* and/or *cognition*, and, just as with *stimulus* and *response* in the 'Reflex Arc', can only be discerned as discrete factors retroactively, the status of any putative act of *perception* becomes irreducibly involved in a much wider bodily event featuring a multitude of interactive 'integration of complex forces', all of which act together to produce the distinct quality of any eventual act of awareness. This much is explicitly confirmed by Dewey when he states:

“As a matter of fact there is no such *thing* as an *exclusively* peripherally initiated nervous event. Internal conditions, those of hunger, blood-circulation, endocrine functions, persistences of prior activities, pre-existent opened and blocked neuronal connections, together with a multitude of other intra-organic factors enter into the determination of a peripheral occurrence. And after the peripheral exci-

tation has taken place, its subsequent career is not self-determined, but is affected by literally everything going on within the organism... A particular excitation is but one of an avalanche of contemporaneously occurring excitations, peripheral and from proprioceptors; each has to compete with others... what happens is an integration of complex forces" (EN, 333-4).

This statement is of immense significance for our understanding of this expanded conception of *perception*, and the precise way in which perception is expanded in scope is hugely informative with regard to our attempts to both link Dewey's concept of temporality with Deleuze's concept of time. For the fact that Dewey explicitly renders the initial enactment of an act of perception as co-extensive with retroactively defined components such as perception, stimulus and response, sensitivity, susceptibility, emotion, etc.⁸⁵; that he integrates the eventual 'felt quality' of the act of perception with the integration of complex internal and external forces; and the fact that any identifiable act of perception or 'seeing' extends into the meaning and value of a selected 'response' and its related consequences; renders Dewey's extended concept of perception as compatible with, and perhaps even analogous to, a later pragmatist concept of *visual perception* developed by James J. Gibson.⁸⁶

5.6. A further naturalist ground for temporality: DeLanda's use of the science of *affordances*

In his section analyzing the concept of time in Deleuze's philosophy, Manuel DeLanda illustrates his point through using a concept derived from the ecological research

⁸⁵ "Immediately, every perceptual awareness may be termed indifferently emotion, sensation, thought, desire: not that it *is* immediately any one of these things, or all of them combined, but that when it is taken in some *reference*, to conditions or to consequences or to both, it has, in that contextual reference, the distinctive properties of emotion, sensation, thought or desire" (EN, 304-5).

⁸⁶ Gibson, James. J. 1979. *The ecological approach to visual perception*. Boston MA: Houghton Mifflin Company. Cited in DeLanda 2004, 72-3.

by James Gibson in his work *The ecological approach to visual perception*. Within this work, Gibson, when studying the nature of ecological interactions, was led to develop the concept of *affordances*. This concept is used to bring out the relational nature of capacities which arise only when two organisms or entities *interact*, as opposed to the properties which are intrinsic to individual entities. An instructive example⁸⁷ would be the fact that an area of ground has intrinsic properties which determine how flat or slanted it is, how rigid it is, how convex or concave it is, and so on. Yet to exhibit the capacity to *afford* sufficient support that an animal of a certain mass, with certain types of limbs (properties intrinsic to the animal), etc., can successfully walk on that piece of ground is not simply another intrinsic property of either the ground or the animal. It is, in fact, a capacity which may not be exercised if there are no animals within the vicinity of that area of ground. In this way, the capacity for that area of ground to support an animal of a certain size and type is *relational*: it is a capacity an individual (area of ground) affords another individual (animal), and is dependent on factors such as their relative spatial scales, mass, surface density, and so on.

Affordances, then, as well as being relational capacities dependent upon interaction for their realization, are also *symmetric*.⁸⁸ The symmetry here amounts to the fact that an affordance involves both the capacity to affect, and be affected. Thus, a hole in the ground affords a place to hide for an animal fleeing a predator, thereby affecting the animal's current state; but the animal could also dig its own hole in the same area of

⁸⁷ Following DeLanda's use of Gibson's example. DeLanda, 72-3, citing Gibson (1979), pp 15-16.

⁸⁸ Following DeLanda's analysis and examples, *ibid.*, p. 73.

ground, in doing so affecting the state of the ground itself. To extend this example in further illustration of the symmetric nature of affordances, it has also been noted that the animal selects to flee the predator on account of the danger afforded by the latter, but the latter selects to chase the former on account of the nutrition it affords.

What is significant about the concept of affordances is the fact that, as DeLanda has shown (*ibid.*, 110-11), they can be equally informatively applied to temporal conditions as well as spatial ones (such as were demonstrated in the examples of the previous paragraph). Thus, whereas in the examples of spatially oriented affordances we focus on quantities of extension - such as an insect of a certain size, mass and body structure being afforded the capacity to walk across the surface of a lake, whereas larger mammals cannot be supported by the surface tension of the water - with temporal affordances we focus instead on the intensive nature of particular timescales characteristic of cyclical oscillations, each located at a particular level of temporal scale relative to others, and forming a nested whole (as when we compare the extremely short timescales of atomic oscillators, to the intermediate scales of biological oscillators, and both of these to the longer timescales of geological or stellar dynamics, and so on). Indeed, DeLanda goes so far as to move beyond the use of periodic cyclical oscillations (circadian clocks, atomic oscillations, etc.) as the sole criteria for identifying characteristic timescales, generalizing the chief criteria of using characteristic timescales for non-periodic physical phenomena such as that exhibited by the relaxation times of a class of solid material referred to as 'glasses'.

Adapting an example comparing glasses to crystalline structures from Arthur Iberall's work, *Towards a General Science of Viable Systems*⁸⁹, DeLanda (*ibid.*, 112) shows the value of characteristic timescales to the development of an idea of temporal affordances. In contrast to crystalline structures, glasses do not have a well defined phase transition from a liquid state (as when liquid water transitions to solid ice, at temperature 0 degrees Celsius/32 degrees Fahrenheit at standard atmospheric pressure). Instead, glasses behave as if they are 'arrested liquids', continuing to exhibit the amorphous molecular arrangement of liquid, but flowing much slower than would be characteristic of a liquid. Following DeLanda (*ibid.*), the distinction between the liquid and glass states might be drawn in terms of *relaxation times*, which are relatively short for liquids and relatively long for glasses.⁹⁰

The crucial point to be drawn from DeLanda's use and explication of these illustrations is this:

"Iberall argues that whether a particular body *appears solid or liquid to a given observer* will depend on the ratio between relaxation and observational timescales, in the sense that for sufficiently long observational times the glass will appear to the observer as a flowing liquid... we can let the liquid and glass interact with each other and speak of how solid the glass "appears" to the liquid,

⁸⁹ Iberall, Arthur. S. 1972. *Towards a general science of viable systems*. New York: McGraw-Hill.

⁹⁰ To aid the reader in understanding this term, DeLanda gives the following as an illustration of *relaxation time*: "the time taken by a radio transmitter to settle into a stable periodic state after being turned on, what engineers refer to as "transient behavior". These transients occur in many phenomena and in each case they display a characteristic time scale. In state-space terminology this can be explained as follows... [A]ll trajectories within a particular basin of attraction will be deterministically drawn to the attractor. Once there they may be temporarily dislodged from the attractor by an external shock but as long as the shock is not intense enough to expel them from the basin, they will return to the attractor. In this case, *the time taken for the trajectory to return to its attractor* is its relaxation time." DeLanda, 111-12.

and vice versa. The glass, given its long relaxation time scale relative to the scale of interaction with the liquid, will behave as a solid, affording the liquid, for instance, an obstacle to its flow, or affording it a channel in which to flow. The flowing liquid, in turn, will afford erosion to the glass. In short, what capacities the glass has to affect and be affected by the liquid will depend on their relative time scales, the characteristic durations of their relaxation to equilibrium.” (DeLanda 2004, 112)

To render the import of this in anthropomorphic terms: too many of our assumptions about time and temporality rely on an uncritical acceptance of the timescale most natural to us, namely that determined by the capacities and structure of human perception as it relates to the aspects of our environment most salient to our continued survival. Just as the school student studying the ant *Polyrhachis sokolova* intuitively understands that the insect, because it can walk across the surface of a lake, whereas we continuously break the surface of the water, must be markedly different from us, we ought to be more cognizant of the differences manifest in temporality. The full implications of our scientific knowledge being used to show that at every level of our environment - universe, even - there are timescales which are relatively shorter or longer, and in being so, exhibit salient features in strikingly different fashion, are not followed to their conclusion. Yes, within the same science class, the teacher may illustrate a point about solids and molecules with the striking example that if someone leans with his finger long enough on the seemingly solid wooden desk or glass of the window, his finger will eventually merge with the wood or the glass in the process of passing through. Yes, too, in a geography class we will learn that we cannot, given the characteristics of our human timescale, observe a glacier moving forward in ‘real’ time, nor the continents merging or moving apart. But the extension of that viewpoint,

which we have here had demonstrated via reference to DeLanda's text, is often not pursued, though it equally be part of our scientific knowledge.

5.7. *Susceptibility* as indicative of educative temporality

For the scope of educative temporality to become fully explicit requires us to analyze the application of *susceptibility* on two levels: that of the individual organism, and that of the organism within increasing wider spatial scales. With regard to the individual organism, the concept highlights the manner in which organisms are comprised of material, chemical and energetic systems and processes, which span the range from discrete items at the molecular and cellular level, through the chemico-material neurological structures of the brain, to the obviously visible structures of organs, limbs, muscles, and so on. As Dewey highlights with his phrase evoking the 'pervasive operative presence of the whole in the part and of the part in the whole', each discrete structure or system is irreducibly interinvolved with others, coming to exhibit nested layers of organization, all of which are eventually interrelated within the wider holistic sphere of the external layer and surface environs of the bodily organism.

When the scope of *susceptibility* is continuously expanded beyond the level of the individual organism to take in what one might somewhat artificially delineate as increasingly expansive and incremental spatial scales (from the individual, to the level of distinct reproductive community, to ecosystem and then particular species, and so on, all the way up to the boundless expanse of the chartable universe) on the one hand, and the increasingly large social 'layers' which interrelate these (progressing, for instance, from the level of the family, to an organization such as their local school,

to the geographically bounded municipal structure of the surrounding village... nation... continent... planet), on the other, we begin to discern, as related to the component parts of each of these systems, processes, scales and layers, a nested set of cycles which define their temporal scope. Thus, applying susceptibility to the individual organism, we can find a spectrum of nested temporal cycles spanning from (as we have seen) the distinct cyclic sequence of oscillation characteristic of the fastest vibrations of subatomic particles, to the oscillation cycle of cells dying off and being replaced, the rhythmic oscillations of breathing or walking, or the increasingly longer oscillations of the sleep-wake cycle (the 'internal clock'), various monthly or yearly cycles, or the length of the cycle required to achieve sexual maturity (DeLanda 2004, 106-8). Expanding beyond the individual organism, we might identify the various daily, weekly, monthly, yearly oscillations of the planets, of the earthly seasons, of the social festivals linked to these, of the family reaching maturity and dying away, or the intricate system of the predetermined temporality at any and every stage or level of the school year.

Thankfully, both Dewey's appreciation of temporality, and Deleuze's work on time, mean that the full ramifications of the viewpoint that temporality exhibits a relative spectrum of temporal scales have not been lost on either thinker, nor, too, their readers. In fact, the full ramifications of the existence of a multitude of different, nested levels of timescales, each differentiated according to the characteristic cyclical oscillations or relaxation times, are explicitly identified by Deleuze:

“In other words, whatever is future or past in relation to a certain present (a certain extension or duration) belongs to a more vast present which has a greater extension or duration. There is always a more vast present which absorbs the past and the future. Thus, the relativity of past and future with respect to the present entails a relativity of the presents themselves in relation to each other. (Deleuze, cited in DeLanda 2004, 110).”

As with Deleuze, so with Dewey:

“Empirical confirmation of this conception of consciousness is found in the extreme instability of every perceived object; the impossibility of excluding rapid and subtle change... Perceived changes are those which require a redirection of adaptive behavior. A prior adaptation constitutes a threshold (better called a platform or plateau); what is consciously noted is alteration of one plateau; re-adjustment to another. Similar events may mean cold at one time or place and warmth at another, depending on the *direction* of organic re-adaption.” (EN, 313).

With his remarks about the ‘instability’ perceived objects, Dewey can be read as highlighting that individual objects are comprised of those very component oscillations, systems and flows we have explored in DeLanda’s work. Indeed, as we saw when we considered Dewey’s concept of *susceptibility* in the previous section, Dewey is quite explicit that organisms are comprised of interrelated, but distinct, component parts, each existing in a nested set spanning from the full bodily organism, down to the oscillations at a cellular level. Furthermore, with his statement that we cannot exclude ‘rapid’ and ‘subtle’ change, we can interpret him as bringing to attention the fact that the timescale for remarking change at the level of human perception is merely one level of perception among a multitude of others. As we have seen, within the human timescale, the oscillations at molecular level are known to occur, but they are too fast for us to perceive; just as the movements of glaciers and continents, the changes of solid objects and surfaces, are too slow for us to notice.

But that these faster or longer timescales are not just incorporated within our experience of temporality, that they in fact effect our experience and our overt behavior, is something Dewey does not merely point out: he, in fact, incorporates it as a central component of his overall view of how education occurs. Thus, with respect to the process of habit-formation - which, as we saw in Chapter 4.6, is an essential aspect of any educative process - Dewey explains how the affairs of faster organic timescales, as well as the longer geologic or stellar timescales, are nonetheless contained in, and effective for, our own present experience:

“We find also in all these higher organisms that what is done is conditioned by consequences of prior activities; we find the fact of learning or habit-formation. In consequence, an organism acts with reference to a time-spread, a serial order of events, as a unit, just as it does in reference to a unified spatial variety. Thus an environment both extensive and enduring is immediately implicated in present behavior. Operatively speaking, the remote and the past are “in” behavior making it what it is. The action called “organic” is not just that of internal structures; it is an integration of organic-environmental connections. It may be a mystery that there should be thinking but it is no mystery that if there is thinking it should contain in a “present” phase, affairs remote in space and in time, even to geologic ages, future eclipses and far away stellar systems. It is only a question of how far what is “in” its actual experience is extricated and becomes focal” (*EN*, 279-80).

It is here that we are reminded of the full scope of Dewey’s concept of temporality, especially the manner in which, through his concept of *rhythm* (analyzed in Chapter 4.5), it exists as not only the *form*⁹¹ and manifestation of the varied instantiations of energy which constitute the full totality of existence (Being), but also that it defines

⁹¹ E.g. “I emphasized the dependence of this final work [of art] upon the existence of rhythms in nature; as I pointed out, they are the conditions of form in experience and hence of expression.” (*AE*, 169.)

(1) the form of existence at the micro level, or that which is strictly beyond the scope of consciousness (e.g. *AE*, 13-14. Cf. Mozur 1991, 328 onwards); and also (2) defines the form of *any* historical career or manner of existence (e.g. *AE*, 14; cf. Calore 1989, 19 & 22). In this way, Dewey can be considered to have shown how temporality can be considered the basis for experience *per se*, and thus becomes a foundational concept in relation to the naturalistic investigation of experience and nature, particularly as it regards the notion of human experience, including those aspects of inquiry, understanding and learning.

In this respect, Dewey's concept of temporality, in functioning as the central, structural precondition for the possibility of experience, is fully in accord with Deleuze's conception of the synthesizing nature of time. For Deleuze,

“Time is constituted only in the originary synthesis which operates on the repetition of instants. This synthesis contracts the successive independent instants into one another, thereby constituting the lived, or living, present. It is in this present that time is deployed. To it belong both the past and the future: the past in so far as the preceding instants are retained in the contraction; the future because its expectation is anticipated in this same contraction. The past and the future do not designate instants distinct from a supposed present instant, but rather the dimensions of the present itself in so far as it is a contraction of instants. (*DR*, 70-71)

The ‘instants’ mentioned are, as we saw in DeLanda's explication of Deleuze, the distinctive temporal scales which define the lived present of any given ‘individual’ - that is, any component part of an organism, where it functions as part of an overall

whole.⁹² With each timescale being contracted and synthesized as part of a wider one, this explains how the multiple levels and layers of time present within any organism come to directly inform the tenor and quality of any given experience. Thus ‘temporal quality’ in Dewey’s terms, is the immediate product of, in Deleuze’s words, the synthesis of these many instants, which comes to constitute the ‘living present’. Just as, with Dewey, the reflex arc is not made up of individual segments, stimulus and response, past and future, but is a *unifying* process; so with Deleuze the past and future are retained within the present, not beyond it. Furthermore, we saw how, with Dewey, the reflex arc circuit proceeds in a nonlinear manner, wherein the designated ‘last’ phase of the circuit (the burn sensation), represents the ‘completion’ or ‘fulfillment’ of the opening stage (*RCP*, 359). Thus the final stage not only ‘reacts *into*’ the opening stage, but comes to reconstitute its sense, meaning and value such that an incidence of ‘learning’ occurs (*RCP*, 359). This much is directly affirmed by Deleuze’s statement that the past (‘the preceding instants’) are ‘retained’ in the present contraction; while his view that the future features in the present in the form of ‘expectation’ and anticipation is wholly in accord with Dewey’s (future-oriented) concepts of ‘anticipation’ and ‘expectation’ (*RCP*, 368. Cf. fn. 60, p. 36, below). Accordingly, for both Dewey and Deleuze, *past* and the *future* do not designate instants distinct from any putative ‘present’ instant, but are rather dimensions of the present contraction, or circuit, itself.

⁹² “[T]he objective reality of affordances with respect to temporal scales makes them the ideal candidate to define the lived present of a particular individual, that is, what the individual ‘perceives’ within its own time scale as the relevant capacities of the other individuals interacting with it... material and energetic processes give time its metric and measurable form by their possession of a characteristic time scale, specified through either relaxation times... or intrinsic period of nonlinear oscillations... at any one of these embedded timescales the present is cyclical, measures the movement of bodies and depends on the matter that limits it and fills it out” (DeLanda 112-13).

A final convergence of great import can be noted when Deleuze speaks of the ‘direction’ of the arrow of time within the present:

“The present does not have to go outside itself in order to pass from past to future. Rather, the living present goes from the past to the future which it constitutes in time, which is to say also from the particular to the general: from the particulars which it envelops by contraction to the general which it develops in the field of its expectation (the difference produced in the mind is generality itself in so far as it forms a living rule for the future). In any case, this synthesis must be given a name: passive synthesis. Although it is constitutive, it is not, for all that, active. It is not carried out by the mind, but occurs *in* the mind which contemplates, prior to all memory and reflection.” (*DR*, 71)

It is striking, here, that by explicitly stating that the present proceeds to the future by way of the past (as we saw in Chapter 3), Deleuze puts himself in full accord with the structure of the reflex circuit as explained by Dewey. We saw, in Chapter 4.7, how the reflex circuit not only proceeds in a nonlinear manner, but specifically that the designated ‘last’ phase of the circuit (the burn sensation), represents the ‘completion’ or ‘fulfillment’ of the opening stage (*RCP*, 359). Thus the final stage not only ‘reacts *into*’ the opening stage (that is, reacts into the *past*), but the plays a crucial role in reconstitute its sense, meaning and value such that an incidence of ‘learning’ occurs (*RCP*, 359).

Finally, through his characterization of ‘rhythm’ as the form and manifestation of varied instantiations of energy, we are enabled to locate a full point of convergence between the concept of rhythm, and the scientific concept of ‘oscillations’ which has been central to DeLanda’s explication of Deleuze’s philosophy of time, and his grounding of that philosophy in contemporary scientific thought.

5.8. A fully temporal model of the educative moment

The model of temporality discernible within the text of *Democracy and Education* has its genesis in the physiological and biological researches of Dewey's early period, and seeks to move away from the Kantian model of time as an a priori schema of understanding that necessarily divorces us from the unknowable *noumena* of things-in-themselves towards a naturalist philosophy of experience.⁹³ Applying to the concept of interest the structure of the model of experience based on the sensori-motor functioning outlined in his 1896 paper *The Reflex Arc Concept in Psychology*, we can provide the basis for Dewey's 'projective' and experimental⁹⁴ temporal model wherein the emphasis is directed towards the future via a *temporal arc*.

As does the corresponding sensori-motor model, so the temporal arc will be seen to be an organic and fundamental psychic unity which, with each aspect reciprocally determinative in relation to the other aspects, is able to undercut the dualisms of sensation and idea, stimulus and response, body and mind, memory and perception, perception and projection. Here, rather than see activity as beginning with the sequence of present perception as a reaction to a stimulus set, each factor existing as something discrete and adequate to itself, we find that the real point of departure is an overall, perhaps even holistic, *dimension* of time, which does not divide itself into the parts past-present-future; which, similarly, does not have a unidirectional flow of causal influence, but which bears within itself the conditions for different *emphases* of di-

⁹³ See Helm 1985, 300-303 for details of this evolution.

⁹⁴ Following Helm, *ibid.*, p. 304.

mensionality.⁹⁵ Thus the past is not divided or counted as discrete from either the present or the future, and neither can this be said of any of these temporal dimensions in relation to one another. Nor is the present 'now' an isolable site of experience, potentially complete within itself, which operates as the sectional link within a linear sequence of past-present-future segments of time. Rather, deriving from an organic percepto-projective co-ordination⁹⁶, the initial stage of temporalization is with the act of projection, wherein the presently perceived environment is interpreted and determined *within* cognition as the facilitator of a specific future aim, or aim in general, in relation to the projected and projecting interest(s) of the self. The process of perception as it is informed by a contemporaneous process of interested projection both inhibits and excites the selection of certain responses towards consummation of the interest or aim, thereby creating a reciprocal circuit of influence.

Yet such interested projection-perception, and by extension, the circuit of influence, is always already mediated by the applied content and influence of prior experience (the past), both as determinative of procedures of selection and control, but also as the ground for discerning a particular source of interest, not to mention the entire possibility of the successful process of interest projection in general. Thus, the present moment, in being entirely constituted by the dynamic and continuous co-ordination of the temporal arc, is continuously enlarged and transformed by the co-existent and co-determinative emphases/influences of the past, present and future dimensions. Indeed,

⁹⁵ Contradistinguishable from the unidirectional flow of causality.

⁹⁶ Following the distinctive usage of this word throughout Dewey's 'The Reflex Arc Concept in Psychology'. Contained in John Dewey: The Early Works, 1882-1898 (Volume 5: 1895-1898). London: Southern Illinois University Press (1972), pp 96-109.

taking any putative aim to be fulfilled, and the resultant phase of consummation comes to inform the quality and value of the initial projection-perception as this relates to memory, thereby informing the whole of that particular temporal arc with the quality of an *informative* experience which, in being an instantiation of learning, renders it a viable influence on the temporalization of separate temporalizing arcs (both actualized and potential).⁹⁷

That the present temporal arc should form a continuous circuit including past and future emphases as part of an organic whole is much confirmed when Dewey writes:

“We find also in all these higher organisms that what is done is conditioned by consequences of prior activities; we find the fact of learning or habit-formation. In consequence, an organism acts with reference to a time-spread, a serial order of events, as a unit, just as it does in reference to a unified spatial variety. Thus an environment both extensive and enduring is immediately implicated in present behavior. Operatively speaking, the remote and the past are “in” behavior making it what it is. The action called “organic” is not just that of internal structures; it is an integration of organic-environmental connections. It may be a mystery that there should be thinking but it is no mystery that if there is thinking it should contain in a “present” phase, affairs remote in space and in time, even to geologic ages, future eclipses and far away stellar systems. It is only a question of how far what is “in” its actual experience is extricated and becomes focal” (*EN*, 279-80).

In this way, what is traditionally conceived of as the present 'now', is, on Dewey's model: a location in space upon which is situated an organized center of temporalizing arcs; each projecting into the environment via an immediate act of investment; each proceeding to fulfillment/disintegration at its own rate and rhythm of temporalization; and each constituted by its transformative circuits of interest which are them-

⁹⁷ Following Dewey's account of the sensori-motor arc, *ibid.*, pp 97-100.

selves constituted by differing emphases on the temporal dimensions (past-present-future) of dynamic experience. The futural emphasis of interest necessarily must contain at least an element of openness to the environment, that process in which we adapt to any new information, patterns, or points of interest. The past emphasis of interest, by contrast, must contain at least an element of selectivity, or that process by which we select for current application the most prudent sequence or item of learned or instinctive behavior through which similar or related situations were effectively dealt with in the past.

It is not necessarily the case that the aforementioned process which comprise these temporal arcs should become conscious, or even register as a specific factor in a current sense of awareness (though they have the capacity to do so). Instead, they are what, following Heidegger, we might call ‘circumspect’, and thus remain fully within the sphere of the preconditions which are required in order for consciousness of experience to become possible.

Part II: Practice

5.9. Dewey’s concept of temporality: Applications to educational thought and practice

It has been established in our section on ‘theory’, above, that temporality exists as a crucial factor influencing the structure of the preconditions required for experience to be possible. That this has important ramifications for the day-to-day practice of education within school classrooms will be explored within this section, with items of relevant, current research mentioned when appropriate.

The main narrative for this section on practice is provided by two important articles which consider the status of time and temporality within education as it is practiced within the West. Those articles are Duane Huebner's "Curriculum as concern for man's temporality" (1967), and Patrick Slattery's "A postmodern vision of time and learning: A response to the National Education Commission Report *Prisoners of Time*." Within this latter work, Slattery explains how contemporary education practice regards time as a variable which is to be 'controlled, managed, and manipulated' (*PVT*, 612), an assumption which is based upon the modernist conception of time as being something which is segmented or divided into interchangeable units of measurement (seconds, minutes, hours, etc.), and which proceeds in a linear fashion. The nature of this assumption is then extended to work in schools where, what is essentially a highly complex system, is segmented into isolated parts (school buildings, people, curriculum), which are then divided into 'coherent' and 'cohesive' systems (grade levels, subject disciplines), and measured in quantitative fashion, and without apparent 'contamination' (*ibid.*). The results of studying these various isolated parts, once generated, are assumed to be generalizable, and thereby applicable to any educational context in the purpose of ensuring 'steady progress' and 'sequential development over time throughout the entire system' (*ibid.*).

The consequence of this approach, as Slattery notes, are twofold: the first consequence being that educational administrators, systems and forms of government have placed an 'exaggerated' emphasis on the manipulation of time as a discrete factor within educational situations (*ibid.*); the second being that research designed to ma-

nipulate time as ‘an isolated, independent and quantifiable variable’ is based upon the misguided assumption, stemming from the Newtonian concept of time, that the universe was created *in* time and space, as opposed to the fact that time is in fact ‘woven into the essence of the cosmos’ (*PVT*, 613).

In developing his critique of the assumptions underlying the current view and ‘use’ of time within school settings, Slattery explicitly positions his work as being in full accord with the earlier work of Duane Huebner, who in his 1967 article, developed a comprehensive critique of the way in which time and temporality are viewed in curriculum planning and construction. Detailing the paucity of the prevailing view of temporality within both curriculum theory and school-based planning, Huebner sought instead to develop an alternative view of temporality, based on the work of Martin Heidegger in *Being and Time*, which would be much more germane and responsive to the potentiality inherent within each student, and the growth of their learning capacities within educational settings.

Slattery and Huebner are both heavily critical of the educational focus on ‘goals’, and, within the present-day classroom, the teacher’s need to clearly state the ‘aims’ and learning goals/outcomes for each lesson. Such a focus on goals is ‘fanciful’ and ‘idle’, according to Slattery, because it attempts to remove educators from the challenges and real difficulties of living historically, particularly with regard to paying attention to the lived experience of teachers and students within each new context (*PVT*, 613). In Huebner’s words,

“It has almost been assumed that if the educator can clearly specify his goals, then he has fulfilled his responsibility as an historical being. But historical responsibility is much too complex to be so easily dismissed” (Huebner 1967, 239. Cited in *PVT*, 613.).”

In ignoring the complex temporal reality of living as an historical being, the use by educators of a modern concept of time instead has a negative impact on the human psyche, a fact which is comprehensively ignored within the construction of contemporary research studies intended to solve complex educational problems and dilemmas (*PVT*, 614). This negative impact is further compounded by the continuing development and reliance on technology and rationalized organizational structures which are supposed to reallocate time more ‘efficiently’, an approach to time and teaching in which time becomes characterized as a ‘restraint’, rather than a positive factor in the developmental processes of growth and learning (*ibid.*). One of the most pervasive, and misguided, assumptions underlying this unsatisfactory use of time is the idea that time, like space, is a ‘one-size-fits-all’ component, which affects and is experienced by individuals in an identical manner, and which can be divided up into uniform segments, arranged in a sequential and linear fashion.

It is this latter assumption which, according to Slattery, is one of the chief motivations behind the report, issued by the National Commission on Time and Learning, entitled *Prisoners of Time* (US Government Printing Office, 1994). This report issues a challenge to educators to ‘fix the design flaw in the way schools are organized, as well as the way time is allocated for academic purposes’ (*PVT*, 615). The Report goes

on to suggest that educators utilize time in ‘new and better ways’, explicitly stating that:

“We recommend that state and local boards work with schools to redesign education so that time becomes a factor supporting learning, not a boundary marking its limits” (*Prisoners of Time*, p. 31. Cited in *PVT*, 615).

But that time is not a ‘one-size-fits-all’ component of the educational process, and that it does not effect students and teachers in an identical or equal manner, is attested to, not just by Dewey’s concept of temporality, or Slattery and Huebner’s work, but by several important findings in contemporary psychology and neuroscience research. Responding to the pioneering work on children’s conception of time by Piaget (1969), in Sylvie Droit-Volet and Pierre S. Zélanti’s study ‘Development of Time Sensitivity and Information Processing Speed’ (2013), the researchers examined whether “age-related changes in the speed of information processing could be determined as the best predictors of the observed increase in sensitivity to time throughout childhood.⁹⁸” They selected study participants who ranged from children aged 5 and 8 years old, to adults, each of whom were given two ‘temporal bisection tasks’, one with short (0.5/1-s) and the other with longer (4/8-s) anchor durations. In addition to this, the participants’ scores on different neuropsychological tests assessing both information processing speed and other dimensions of cognitive control (short-term memory, working memory, selective attention) were calculated. The results determined that:

⁹⁸ Droit-Volet, Sylvie, and Zélanti Pierre S. 2013. “Development of Time Sensitivity and Information Processing Speed.” *PLoS ONE* 8(8): e71424. doi: 10.1371/journal.pone.0071424. Quoted parts are from the ‘Abstract’.

“[T]he best predictor of individual variances in sensitivity to time was information processing speed, although working memory also accounted for some of the individual differences in time sensitivity, albeit to a lesser extent. In sum, the faster the information processing speed of the participants, the higher their sensitivity to time was. These results are discussed in the light of the idea that the development of temporal capacities has its roots in the maturation of the dynamic functioning of the brain. (Droit-Volet and Zélanti 2013, ‘Abstract.’)”

The results of this study, then, demonstrate two crucial facts about temporality, that is: the lived, historical experience of temporal passage. First, that (1) as the authors state it, the “the encoding and judgment of time are inherent to the dynamic functioning of the brain.” But what follows from this is the fact (2) that, if - as the study purports to show - “the faster information processing is, the more sensitive subjects would be to time” (*ibid.*, page 3), then it also follows that depending on the individual dynamic structure of their brain, not just different individuals, but children, adolescents and adults of different ages, each will display differing levels of sensitivity to time. That is to say that, different individuals, at different age levels, will experience duration in different ways. Thus, the temporality of a five minute task for an educator, teaching to the predetermined aims of the lesson, and the goals of the curriculum, will be very different to that of the student undertaking the task. The lived quality of that duration will also differ in marked ways between students, according to the way in which past experience has influenced the dynamic processing capacities of their individual brains.

That this circumstance should have a profound and direct effect on the very nature of learning and education is not surprising. Indeed, if we consider the general notion of ‘intelligence’, deemed as a factor central to the capacity to learn - with learning itself regarded as central to the process of education - then that, too, exhibits close and irreducible links to temporal experience. As Droit-Volet and Zélanti go on to observe, Rammsayer and colleagues, who obtained similar findings on temporal sensitivity in human adults, hypothesized “a temporal resolution power” and suggested that “the capacity for temporal accuracy would be a major predictor of general intelligence (factor g)” (*ibid.*, page 7 ‘Discussion.’). As the latter group of authors argue, in language that links directly to our analysis of Dewey’s concept of *rhythm* as the structural form of temporality, as well as the grounding role of oscillations in determining temporal scale in DeLanda’s work: “the degree of temporal resolution would be an indicator of the dynamic physiological activity of our brains: A higher rate of neuronal oscillation should bring about faster and more efficient information processing and a higher level of temporal resolution” (*ibid.*).

Furthermore, the fact that temporality is not experienced in a uniform manner among individuals of differing ages is one finding which undercuts the modernist notion of time as possessing a unitary nature. That time is, as with Dewey’s concept of temporality, neither unitary nor linear is further attested to by the existence of ‘illusions in

time distortion.’ Thus, in their article *Perceiving the Passage of Time: Neural Possibilities*⁹⁹, Muller and Nobre discuss how:

“[I]t has been demonstrated that, even within the visual modality, temporal perception of different events can be differentially distorted. For example, maintaining gaze on a moving stimulus in one portion of the visual field reduces the apparent duration of stimuli subsequently presented to that location, but not to other locations. Therefore, temporal perception in any given spatial region of the visual field is at least partly independent of temporal perception in other regions—again incompatible with a common, centralized representation of time in the brain... Additional profound illusions come from studies investigating the perceived duration between one’s action and its inferred effect. When individuals are asked to press a button to “cause” a tone, the estimated perceived time between the button press and the tone is reliably shorter than the actual time.”¹⁰⁰

The existence of such temporal illusions as shown in the above named studies is clearly incompatible with the modernist notion that our perception of events proceeds in a linear fashion, and does much to attest to the non-linear nature of the model of temporality found the work of Dewey and Deleuze. Indeed, it goes some way to demonstrating that Dewey was both accurate and prescient in his statement, in the reformulated sense of the reflex circuit, that the ‘before’ and ‘after’ of the notions of ‘stimulus’ and ‘response’ are only determined retroactively (*RCP*, 359, 365 & 370).

⁹⁹ Muller, Timothy, and Nobre, Anna C. 2014. “Flow of Time: Perceiving the passage of time: neural possibilities.” *Annals of the New York Academy of Sciences*, 1326(1): 60-71. doi: 10.1111/nyas. 12545

¹⁰⁰ *Ibid.*, page 61.

Comprehensive proof of the very real sense in which temporality is irreducibly interwoven into the subjective quality of the experience of a dynamic, historical being is provided by a study which discusses the time-emotion paradox in psychology.¹⁰¹

In the article, Droit-Volet and Gil show that, despite the fact that humans possess the capacity to accurately estimate time – as if we possess a specific mechanism that allows us to measure time (such as an internal clock) – human representations of time are, as was shown in Muller and Nobre’s study, nonetheless easily distorted by context. Indeed, the human sense of time is heavily dependent on both an ‘intrinsic context’ – something which is partly determined by our identifiable emotional state – and on ‘extrinsic context’, which Droit-Volet and Gil describe as “the rhythm of others’ activity”¹⁰². The authors go on to cite existing studies on the relationships between time and emotion which suggest that such contextual variations in subjective time “do not result from the incorrect functioning of the internal clock but rather from the excellent ability of the internal clock to adapt to events in one’s environment.”¹⁰³ Their conclusion directly supports both Huebner and Slattery’s attempts to move educational thinking away from a modernist, linear conception of time, replacing it with a much more subjective, qualitative sense of an individual’s temporality, as displayed in Dewey’s model:

¹⁰¹ Droit-Volet, S., and Gil, S. 2009. “The time–emotion paradox.” *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1525), 1943–1953. doi:10.1098/rstb.2009.0013

¹⁰² Ibid., ‘Abstract.’

¹⁰³ Ibid.

“[T]he fact that we live and move in time and that everything, every act, takes more or less time has often been neglected. Thus, there is no unique, homogeneous time but instead multiple experiences of time. Our subjective temporal distortions directly reflect the way our brain and body adapt to these multiple time scales.” (Droit-Volet and Gil 2009, ‘Conclusion.’)

Not only does this expose the experiential, historical and subjective nature of temporal experience, it also recalls DeLanda’s use of Deleuze’s philosophy to develop a concept of time exhibiting multiple timescales, each dependent on the nature of the oscillations peculiar to each component of an organism, something we saw echoed in Dewey’s developments of the concepts of sensitivity and susceptibility. That the latter two concepts have been shown to feature as a key structural aspect for the preconditions of subjective experience in a very real way underlines the fact that Dewey’s concept of temporality is one which is fully compatible with the science behind our emerging understanding of how we think, feel and learn. That the concepts of sensitivity and susceptibility should play a key role in the preconditions of educative experience, is one validation of Dewey’s educational philosophy. That those two concepts should also provide the means by which that educative experience can be seen to be thoroughly temporal, and in accordance with the model of temporality that features in Dewey’s work, is surely a vindication not just of the concept of temporality developed by Dewey, as well as the wider theory of education of which it is a central part.

The implications for educative practice which arise from the structure of Dewey’s model of temporality are stated effectively and succinctly by Slattery:

“[E]ducators and researchers envision reality as linear when they conceive of time as an independent variable to be manipulated to improve educational outcomes, for example, within quantitative studies examining timed tests, contact minutes, or time on task in the classroom that purport to demonstrate the educational effectiveness and efficiency of specific treatments and methodologies. Postmodernism challenges this assumption and argues that our very understanding of time must first change before the stress of time constraints can be ameliorated and the educational process will become meaningful and consequential in the lives of teachers and students...” (*PVT*, 618).

The postmodernist vision of educational time developed by Slattery, and the postmodern view requiring curriculum theory to become based on a conception of temporality developed by Heidegger, have done much to suggest the ways in which the educational process can be made more meaningful and satisfying - especially should it recognize the insight, embodied in the work of each of the philosophers studied in this thesis, that it is the nature of temporality to provide a form and structure to experience that operates not as a boundary, but as an essentially productive and constructive function, and one which underlies any sense in which the new can be produced, or an act of learning occur. But the nature and outline of that postmodernist view of time was already present in Dewey’s 1896 Reflex Arc paper – a view which Dewey went on to establish on a fully temporalized basis in his later work, and a view which exists as the precursor to both the science and the educational theory which has been outlined in this closing section of the thesis.

Conclusion

This thesis has sought to demonstrate that, contrary to present scholarship on the matter, a nuanced and sophisticated concept of temporality, and one fully in accord with

that exhibited in his later work, can be discerned in Dewey's early work, particularly his Reflex Arc paper (1896) and *Democracy and Education* (1916). This was demonstrated with a close reading of Dewey's Reflex Arc essay in Chapter 4.7, and also by the reformulated concept of temporality, read into *Democracy and Education*, presented in Chapter 5. In the course of analyzing Dewey's concept of temporality, we have been led to note the fully naturalistic foundations of his philosophy, foundations which enable us to ground the concept of temporality on both the scientific thought of his own time, as well as current scientific research being produced today. Furthermore, in exploring these naturalist foundations, we have been able to discern telling links and parallels between Dewey's work on temporality, and the work on time and temporality produced by the philosopher Gilles Deleuze, and also, through Deleuze's reading of him, Henri Bergson. In drawing out these links and parallels, we have been able to show that Dewey's early concept of temporality represents a sophisticated and innovative contribution to the field of philosophy of temporality - a field which, drawing on the point of departure provided by Immanuel Kant's work on the concept of time, was established in full by the phenomenological project of Martin Heidegger, particularly as it is found in *Being and Time*. In being based upon such naturalistic foundations, the full scope of Dewey's concept of temporality thereby represents an ongoing opportunity through which his work can be brought in line with current psychological research and educational practice.

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