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J. CHARLTON

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Towards a relational ontology of the digital in art practice

James Charlton

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Acknowledgments

A few lines in the preface of this dissertation hardly seem an adequate way to acknowledge the input and support I have had while undertaking this PhD. Accepting this limitation, I will attempt to express my appreciation for all those who have made this incredible experience possible. In acknowledgments such as this many PhD candidates are quick to recognise that their achievement is not theirs alone. Indeed, I truly understand now that it takes a 'team' effort to complete such an undertaking. The effort here has been spread over two hemispheres, engaged four key education institutions, and imposed itself on the family and whanau and friends of all those associated with it. So while it is important to acknowledge the input of specific individuals here I recognise that there are many more who will go unacknowledged but not unappreciated.

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closely. PhD study is notoriously lonely, or so I am told. This makes the supportive and robust friendships forged across three continents even more remarkable. Particularly here I want to thank Lisa for her enthusiasm, honesty and openness which have been relentless throughout. And to Rachelle – even though you may never understand my PhD – you have been wonderfully supportive in both professional, practical and social ways for which I am forever grateful.

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Undertaking a PhD, it seems, is much like a game of catch – you can't really do it on your own.

Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Sub-Committee. Work submitted for this research degree at the Plymouth University has not formed part of any other degree either at Plymouth University or at another establishment.

Relevant exhibitions and conferences were regularly attended at which work was often presented including:

Charlton, J. "Acts of Materiality." Making Futures Vol 3. N.p., Apr. 2014. Web.
Charlton, J. "Add to Shopping Basket." A Peer Reviewed Journal About 4.1 (2015): n. pag. Web.
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Charlton, J. "Transmediale 2014 Afterglow -- Post-digital Research." N.p., 03 Apr. 2014. Web. Video of Post-Digital Research Panel.
Charlton, James. Three Actions in 56 Bytes. 2014. Mila Kunst Gallery, Berlin, DK.
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Documentation of artworks produced or exhibited as part of thesis are available at http://idot.net.nz

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Abstract

CATCH | BOUNCE:
Towards a relational ontology of the digital in art practice

James Charlton

How might 'the digital' be conceived of in an 'expanded field' of art practice, where ontology is flattened such that it is not defined by a particular media? This text, together with an installation of art work at the Exhibition Research Lab, Liverpool John Moores University (13-24 March), constitutes the thesis submission as a whole, such that in the *practice* of 'reading' the thesis, each element remains differentiated from the other and makes no attempt to 'represent' the other. In negating representation, such practices present a 'radical' rethinking of the digital as a differentiated *in-itself*, one that is not defined solely by entrenched computational narratives derived from set theory.

Rather, following Nelson Goodman's nominalistic rejection of class constructs, 'the digital' is thus understood in onto-epistemic terms as being syntactically and semantically differentiated (*Languages of Art* 161). In the context of New Zealand Post-object Art practices of the late 1960s, as read through Jack Burnham's systems thinking, such a digitally differentiated ontology is conceived of in terms of the *how* of *practice,* rather than *what of* objects ("Systems Aesthetics"). After Heidegger, such a practice is seen as an *event* of *becoming* realised by the method of *formal indication,* such that what is concealed is brought forth as a *thing-in-itself (The Event*; *Phenomenological Interpretations* 26).

As articulated through the researcher's own sculptural practice – itself indebted to Post-object Art – *indication* is developed as an intersubjective method applicable to both artists and audience. However, the constraints imposed on the *thing-in-itself* by the Husserlian

phenomenological tradition are also taken as imposing correlational limitations on the 'digital', such that it is inherently an *in-itself for-us* and thus not differentiated *in-itself*. To resolve such Kantian dialectics, the thesis draws on metaphysical arguments put forward by contemporary speculative ontologies – in particular the work of Quentin Meillassoux and Tristan Garcia (*After Finitude*; *Form and Object*). Where these contemporary continental philosophies provide a means of releasing *events* from the contingency of human 'reason', the thesis argues for a practice of 'un-reason' in which *indication* is recognized as being contingent on speculation. Practice, it is argued, was never *reason's* alone to determine. Instead, through the 'radical' method of *speculative indication,* practice is asserted as the event through which the differentiated digital is revealed *as a thing-in-itself of itself and not for us.*

Note to Reader

> In working out our question, have we not 'presupposed' something which only the answer can bring? (Heidegger, *Being and Time,* 27)

The function of this note is to provide a position outside of the dissertation 'text' in order to position the research, and make it clear that the strategies employed are a logical consequence of the argument, such that it could not be satisfactorily articulated otherwise without compromising the claims it makes. To achieve this, while it is necessary to assume some reflexive distance, and to some extent provide an overview of the dissertation, the primary purpose is to speak to the form that the thesis takes, rather than the argument it makes. As such, this note should not be taken as an 'explanation' of either the artwork or text. Instead, it operates as a framing of the epistemic position so that further methodological insight can be gained. It is with this aim of situating the claim to knowledge that this note is provided.

The research sets out to understand how 'the digital' might be conceived of in an 'expanded field' of art practice, where ontology is flattened such that it is not defined by a particular media? Conceived of in this way, digital ontology is treated as a fundamental ontological state that transcends media domains, rather than as a condition exclusive to or inherent in the conception of the techno-computational. The question of what it means for a thing to be digital and what it means to have a digital art practice is thus driven by onto-epistemic considerations, rather than computationally determined conditions.

Framing the thesis in this way recognises a point of convergence by which the conceptual art practices of the 1960s and theoretical conceptions of the digital align in non-deterministic ways, but it also locates my own art practice within the research through the seminal

influence of New Zealand Post-object Art. Inherent in the research question, a comparison is also made between the flattening of the ontological plane and the expansion of the field of practice in such a way that challenges the correlational assumptions of Kantian metaphysics. It is, then, at the confluence of these concerns that practice is situated as a research question.

From the outset it should be noted that the dissertation is comprised of both this text document and the artworks exhibited at the Exhibition Research Lab, Liverpool (13-24 March): a point emphasized by the inclusion of each work in the list of contents where – along with sections of text – they are framed as appendices. The intention is that they collectively provide the means by which the research findings are articulated without privileging either: the written component does not seek to explain the exhibited component any more than one artwork seeks to explain another. Outside of the Contents page there are no direct references to the exhibition or documentation of the artwork in this text. While the written component of a thesis typically includes images of the artworks made or exhibited in order that the written document provides a satisfactory record of the practical component, this contradicts the position taken in this research regarding the construction of knowledge. While committed readers might seek out incidental resources in the form of both authorized and unauthorized online content arising from the exhibitions, the speculative proposition of this artwork persists, such that together with this written document it collectively forms a 'text' that acknowledges the agency of the 'reader'. Though the primacy of this agency, both the text and artworks are treated as necessary 'appendices' to the knowledge proposition itself – a proposition that is imbedded in the hermeneutic practice of reading between the reasoned and speculative parts of the 'text' as a whole.

This mereological construct operates at multiple levels through the dissertation and is as true of the relationship between individual artworks

as it is of sections of writing: as such the 'reader' is asked to negotiate between dropping basketballs in the exhibition, and interpretations of Heideggarian *being* in the thesis text, in much the same way that they might engage with the polaroid image of a pigeon and the polystyrene sculptures of a dog in the exhibition. The work of 'reading' the dissertation in this way is not strictly a practical activity but operates in terms comparable to the artist's engagement with materials such that words – as materials – are given agency in practice. 'Reading', as practised throughout this dissertation, is thus understood as the work of bringing-forth knowledge.

Acknowledging the agency of the reader in this way, while challenging to explicative conventions of academic research, is seen as being consistent with the research proposition, such that another approach would not only fail to present the findings, but also risk calling into question the validity of the argument by undermining the methods used to construct the mereological proposition in the first place. As will become clear, this problematisation of the relations between parts and wholes is itself derived from Nelson Goodman's definition of the digital as a "differentiated representation".

Departing from the constructs of set theory that underpin techno-computational digital ontologies, Goodman's *differentiated* is taken to be a philosophical question about what is admitted as a thing in-itself rather than a question regarding computational materiality. Necessarily independent of representation, *differentiation* presents the epistemic dilemma of *how* we know *what* a thing in-itself is, and what methods we can use to differentiate ourselves from such things. It is the compounding nature of this that drives the onto-epistemic inquiry which in turn determines the methods used to gain access to the *differentiated* digital. Method thus assumes onto-epistemic significance, such that what it means to have knowledge of something is itself brought into question.

Through an interpretation of Heidegger's *Being*, practice is identified as a method by which the differentiated in-itself can be made onto-epistemically present. Thus, with the knowledge proposition of the dissertation embedded in practice, access to it is necessarily gained through practice. Practice in this sense is applicable to the 'reader' of the 'text' as much as it is the writer, researcher or artist. Again following Heidegger, the method by which practice realises this is by *indicating* towards knowledge, such that the reader is instrumental in the instantiation of the digital in-itself.

Thus, in contrast to academic convention that typically seeks to verify claims of knowledge from positions objectivity located outside of the subject, this research seeks to 'situate' knowledge in the methods of production that constitute knowledge: the practice of knowledge as already discussed. Although unconventional, this argument is not original and draws on other critiques of objective knowledge to substantiate the claim that by positioning practice in this way, the differentiated digital can be affectively articulated as an in-itself.

Highlighting the problems inherent in so-called practice-based PhD submissions, this position is extended by the written component of the dissertation, such that the text itself performs the same indicative function as the exhibited work. This equivalency is evidenced in a number of the strategies employed here, reflected in the written text's non-explicative attitude towards the exhibited work, and the sequential numbering of each section of text to correspond with the work exhibited. These written sections - the appendices to practice - follow on from the seven art works presented for exhibition and so begin at Appendix 8. Furthermore, these written parts do not conform to a conventional dissertation structure by which a literature review, methodology, findings and conclusion might be set out as chapters. Instead the written text is divided into three distinct sections: Appendix 8 identifies a point of

departure whereby the digital, conceived of in non-computational terms, is articulated as a *differentiated thing in-itself*. Appendix 9 positions New Zealand Post-object Art as a form of conceptual art in relation to this philosophical reading of the in-itself, and establishes a method by which, in Heideggerian terms, this might be practised. Appendix 10 addresses the correlational limits of this method and responds not only to the philosophical questions raised by contemporary speculative ontologies but also to the methodological challenges they present to the contingency of the human coefficient in art: how to formulate a method of practising the digital without the contingency of *Being*. It is, then, the need to maintain the coherence with this method – to articulate the knowledge proposition without recourse to the contingency of correlational reason – that ultimately defines the speculative structure of this dissertation.

Reflecting these structural concerns, the discursive nature of the writing, that allows the argument to develop throughout, also does not follow academic conventions. This will become evident in both the interwoven nature of the argument, whereby different threads repeatedly interject into others, but also the manner by which ideas and terminology are introduced often before being more fully explained. Like the dense style of the writing itself, the collective aim of such strategies is to draw the readers' *intention* to their practice as the site of *differentiation, such that* what is digital is revealed in that practice.

In case this discursive approach is taken as a simple recounting of the research's own narrative, I refer back to the inference made in the research question regarding non-correlational ontologies and conceptual art practices, and point out that the research inquiry began with consideration of the speculative ontologies that only appear here in the final Appendix. The way in which the research is articulated is then clearly a considered strategy, one that seeks to articulate the research finding in accordance with the knowledge proposition.

The conclusion that is eventually 'revealed' is a challenging and 'radical' proposition that has implications that extend well beyond the research question. For in seeking to understand how the digital becomes differentiated *in* art practice, the correlational contingency of art is pushed to confront its own reasoning. Although this thesis is informed by a broad range of philosophical ideas, it should be made clear that it is always committed to artistic rather than philosophical speculation. In this regard, philosophy alone is seen to be an impractical method for understanding practice. While the contribution made here should be understood in artistic terms, it is only in the full spectrum of the flattened field of practices that are embraced by this thesis, that the correlation of practice itself is challenged to explain how a differentiated digital can be revealed in the event of practice as a thing-in-itself, for itself. Only in the double action of such a speculative proposition can what has been indicated by the throw of practice, bounce back at us to be caught.

CATCH | BOUNCE

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Appendix 8 **Digital Differences**

8.1 **Small Talk**

> Instead the promise of exponential growth in computing /$/ volume demanded that the sixties be regarded as "almost a new thing" and to find out what the actual "new things" might be. (Kay 1)

As Alan Kay acknowledges in his account of the development of "Smalltalk" – one of the earliest object-oriented programming languages (OOP) – the 1960s saw the start of a Kuhnian 'paradigm shift' in computing (Kuhn 1).[1] Despite the risk of reinforcing digital computational narratives, Kay provides a useful point of departure from which to examine digital ontologies: by identifying the motivational core of OOP, he locates its underlying concepts within broader philosophical frameworks that speak directly to the nature of the digital. Smalltalk's objects, he says, "philosophically have much in common with the monads of Leibniz and the notions of 20th century physics and biology" (2). Indeed, it seems fair to say that OOP's metaphorical conception of 'objects' draws on our understanding of physical objects to advance a broader research agenda regarding "notions about 'human-computer symbiosis'" (Kay 1). The OOP 'object', then, is a device which uses human experience as the basis for approaching programming by drawing on the way that we semiotically interpret the affordances of physical objects, interpreting them as instances of classes with particular inherited attributes and behaviours.[2] For artists attuned to reading the material attributes of objects as part of conceptual content, OOP's dematerialised object will perhaps be reassuringly familiar as it evokes the conceptual art practices of the same period – in general those highlighted by Lucy Lippard and John Chandler in "The Dematerialisation of Art" (1968). In the context of this thesis, such 'dematerialisation' is framed specifically in terms of New Zealand Post-object Art – a strain of conceptualism that emerged in New Zealand, Australia and England in the late1960s. Increasingly acknowledged as significant in the development of contemporary art in New Zealand,

Post-object Art has been a seminal influence on my own artistic practice and serves to situate the methods and motivation used in this thesis.[3] In particular, the post-object's emphasis on the 'how' of material events foreshadows the ontological stance that guides this thesis throughout. By situating the impetus for the thesis in this way, the 1960s 'sixties' is seen as a key moment in both computing and art where, referring back to Kay, the *almost new thing* promised to reveal the *new thing*.

While the 1960s' confluence of the physically and computationally dematerialised object serves as a constant background to this thesis and resonates throughout, it presents a fundamental philosophical problem – a problem that affirms the connection between digital objects and art objects, and in which we can begin to identify the core ontological nature of the digital in philosophical terms.

In evoking Gottfried Leibniz's monad, Kay attempts to explain the fundamental nature of the OOP 'object' as a self-describing potential (2). Leibniz's conception of the monad will be discussed in more depth shortly, but for the time being it is adequate to think of monads as immaterial and discrete fundamental elements.[4] Kay goes on to explain the monadic nature of OOP 'objects' as idealisations from which things are manifest. But he further explains that these idealisations or 'Ideas', as he calls them, "are themselves manifestations (of the Idea-Idea) and that the Idea-Idea is a-kind-of Manifestation-Idea- -which is a-kind-of itself, so that the system is completely self-describing" (2). Kay's interpretation of Leibniz's monad here is based on the idea that an OOP object is a fundamental element or unit that – as the ultimate abstraction – contains all requisite attributes. Thus the monad conceives of itself as capable of representing anything.[5] The OOP object is a monad by virtue of it containing/concealing all necessary content (data) and methods within it. In contrast to Procedural Programming languages in which procedures and data are not encapsulated but implemented in top-down routines, Kay's depiction of the OOP object as

a monad seems a reasonable analogy to make. However, Kay is clearly making a liberal interpretation of Leibniz here and navigating around functional aspects of OOP instances, instantiation and inheritance[6] which effectively break down the monadic metaphor by conceiving of the object as a composite that doesn't rigorously bear comparison with Leibniz's full account of a 'windowless' and immutable monadic form (*Discourse on Metaphysics* 111).[7]

Kay's understanding of an 'object' here is perhaps closer too Joseph Kosuth's conception of 'art as idea as idea' in that it to compounds objects in tautological recursions through which the object becomes its own subject.[8] The 'object' is the object-as-idea of an object, one whose condition depends on its self-defined existence. Indeed, it seems that the tautological hermeticism with which both Kay and Kosuth approach objects is rather similar. Both treat objects as self-verifying abstractions that have no need for external referents and are in a sense monadic. To Kosuth, "the 'art idea' (or 'work') and art are the same and can be appreciated as art without going outside the context of art for verification" ("*Art after Philosophy*" 13-33). Like Kay, Kosuth references the monad in *The Square Root of Minus One, No.* 6 (1988), a work in which a large sheet of glass with the text "I should like to take this into me and to keep that out of me" printed on it leans against the wall on which the Greek word "μονάς" – monás, the etymological root of monad, is painted. While we can directly connect both Kay and Kosuth's thinking about the 'idea of the idea of a thing' to a tautological reading of monads, neither seem interested in addressing the deeper implications of monadic discreteness – of the ontological doubling of the thing as simultaneously solipsistic and relational. It is resolving the ontological tension between the discreetness of things and the continuity of their being that forms the basis of this inquiry and provides a framework that is sustained throughout as I attempt to to release the digital from its hermetic computational black-box.

8.2 **Monads**

As the monad has initially provided a functional way of connecting computer programming with artistic practice, we should now examine it further to see how it opens up the question of 'the digital' and establishes an understanding of it that might be useful with regard to artistic practice.

Unlike monads themselves, Leibniz's *The Monadology* needs to be understood as an amalgam of ideas developed in his earlier text.[9] While it is not necessary to expand on those fully here, it is helpful to understand them as part of a broader metaphysical framework because this signals some of the epistemological and methodological challenges which confront this thesis. In this sense the monad is to be seen here as more than simply an ontological entity to be defined; rather it is seen as a mode of being that poses onto-epistemic questions about the conventional understandings of the digital.

Although Leibniz opens *The Monadology* saying that monads are "nothing else than a simple substance", this needs to be understood in terms of his conception of substance and the means by which it is to be taken as being real or true. Leibniz defines this as the condition whereby the "predicate is in the subject" (*The Monadology* §1; §VIII).[10] What Leibniz means here is that following the *principles of sufficient reason* – which state that nothing is without cause,[11] the basis of every subject is, at the same time as it is contained in the subject, necessarily in the predicate's conception of that subject. This conception is such that it forms the basis of reality for the subject that is the 'cause' for its being. Leibniz explains this in a letter to Antoine Arnauld:[12]

> Given the premise that in any proposition of fact the predicate is contained in the subject, though by a connection that depends on God's free decrees, it obviously follows that the concept of each

> person or other individual substance contains once and for all everything that will ever happen to it; for this person or other substance can be considered as the subject and the occurrence as the predicate, and we have established that every *predicate of a true proposition is contained in its subject*, or that *the concept of the subject must contain the concept of the predicate*. (*Discourse on Metaphysics* 34; my emphasis)

Substance and predication are thus necessarily bound together in a network of monadic reasoning that – according to reason – renders them true: there must be simple substances – monads – because there are composite substances that have to be made up from something (Rutherford from Platt § 2). Or as Leibniz puts it in a subsequent letter to Arnauld:[13] "[…] if there are aggregates of substances then there must be genuine substances for the aggregates to be aggregates of" (Bennett, *The Correspondence Between* 59). Apart from the stunningly blunt logic, what is perplexing in this statement is the double take that Leibniz insists upon: a *rebound*[14] that at once renders the monad "windowless" and yet dynamic, or as Leibniz puts it "pregnant with the future" (Rescher § 22).[15] This fecundity is born of the monad's 'perfect' temporal nature which, from its discrete inception, holds in it everything that happens to every other substance, including potential spatiotemporal relations both past and future (Rescher 21-22).

Although I'm not sure he would see it exactly this way, Leibniz's monad presents an ontologically self-actualising being, as he explains: "they have a self-sufficiency […] which makes them the sources of their internal actions and, so to speak, incorporeal automata" (Rutherford from Platt, § 18).[16] Where Leibniz might disagree with this reading is that while he sees monads as self-sufficient, he does not see them as self-generating. In other words, they came from something else – the substance of self-sufficient reason. For Leibniz this is God – the infinite "magnitude of positive reality" of which nothing is independent

(Rutherford from Platt, § 38-41). I do intend to resolve this problem of the concomitance of monads and transcendence here as we will return to it again in Appendix 9. Here my aim is simply to problematise the doubling nature of monad as a way of challenge the discreteness of the digital.

The monad as described is a double-play on multiple levels: it is both substance and substance-less event – it is a 'thing' in itself and yet nothing other than the potential of itself. Potential events are possible because the monad, although discrete, is always in networked relation to other monads. Things happen in this network because the potential of all subject-predicate relations are seen to be held implicitly within monads which, as invisible substances, might be seen as the concept of relational potential – a discrete potential that "can only begin or end all at once", as opposed to the "composite [that] begins or ends through its parts" (Rutherford from Platt, § 6). Ontologically elusive, Leibniz's monad seems to simultaneously incorporate both thing and event, subject, object and predicate in a fluid yet discrete being.

Such evasive duplicity hardly seems to be relevant conceptual grounds for building a programming language, let alone the basis on which to formulate a definition of the digital which, after all, we are told is premised on absolute binary oppositions that oppose such indeterminate vagaries. But this is exactly the problem that must be addressed if we are to conceive of an artistic practice which is truly digital in a discrete monadic sense. Of course, this ambition contains the supposition that the digital is discrete and can therefore be thought of in the terms described. To explain how this might be possible, it is helpful first to understand the way in which monadic discreteness differs from other understandings of discrete entities. Once a clear understanding of how discreteness is to be treated here has been established, the way in which it is to be positioned with regard to the digital can be developed so that it informs the question of practice.

8.3 **Discreteness and Differentiation**

> Since the misleading traditional terms "analog" and "digital" are unlikely to be discarded, perhaps the best course is to try to dissociate them from analogy and digits and a good deal of loose talk, and distinguish them in terms of density and differentiation - though these are not opposites. (Goodman, *Languages of Art* 160)

Given its prevalence in theoretical texts, discreteness should not be that bothersome a concept when it comes to defining the digital. From Jerry Fodor and Ned Block's 1973 paper *Cognitivism and the Analog/Digital Distinction* to *Aden Evens'* 2015 book *Logic of the Digital,* discreteness is a term that is widely used to define what it means for a thing to be *digital.* Corey Maley directly associates it with David Lewis' 1971 paper, *Analog and Digital* (Maley 2). Maley's treatment of it extends D. Lewis' explanation of the differences between analog and digital and conforms to an often unattributed basis of analysis of the digital across a range of disciplines[17] – Evens' recent publication providing an example in which the digital is by default taken as being discrete without acknowledging prior use of the term, or indeed what is really meant by it with regards to the digital.[18] Rather, Evens seems happy to rely on a narrow etymological reading which approaches the digital via its Greek root – "deixis, the act of pointing out" – and proceeds without real qualification to describe the digital as a being "*marked by discrete distinction*" (*Logic of the Digital* 16). Although only providing a weak justification for use of the term discrete, Evens' conception of the *digit* as a pointer that pulls "something out of its immediacy" resonates with epistemic and methodological arguments that will be developed in Appendix 9 (*Logic of the Digital 16)*.[19] Here, however, it seems important to look more closely at the term 'discrete' in order to understand if its use in regard to the digital is justified and if so in what terms it might be understood.

Turning to D. Lewis' paper one might then expect to find some further basis for the argument of a 'discrete' digital ontology. Instead we find that D. Lewis never actually uses the term discrete, even though Maley firmly associates him with it to the extent that he valiantly defends D. Lewis' account of it![20] The term D. Lewis uses instead is "differentiated" ("Analog and Digital" 321). Of course to some extent what is discrete can also be described as being differentiated and so the words are somewhat interchangeable. To be discrete means that a thing is an unconnected entity - an individual, differentiated from other entities (Trumble and Stevenson). While it is easy to see how this appeals to the espoused hermeticism of the computational *bit* – the smallest unit of computer data – it is purely a descriptive term. On the other hand, 'differentiated' signals the *act* of differentiating in both transitive and intransitive forms. This active sense is useful here in that it speaks to the question of practice, in particular its intransitive form – which does not allow for a direct object – anticipates an entirely different ontological condition. Both terms – discrete and differentiated – are thus ontologically relevant and will continue to be used through the text in this way: the use of *discreet* will be used to describe individual entities or objects, whereas *differentiated* will be used to address actions or events which are in themselves a *thing*. The reason for maintaining this dual terminology will become clearer as the question of what it means to be 'differentiated' unfolds.

Despite the evident similarity of these terms we can perhaps interpret 'slippage' in their use as reflecting the different critical contexts, as is the case with the authors cited here: whereas D. Lewis' brief text is committed to developing a definition of the analog/digital distinction that coincides with "ordinary technological language", Maley's interest in the digital is aligned with philosophical issues pertinent to the cognitive sciences ("Analog and Digital" 322 & Maley 1).[21] This draws to our attention an alternate context for understanding the digital – be it discrete or differentiated – one that is not driven by technologically

determined language. Such determinacy is reflected in Evens' *Logic of the Digital,* where, even before we open its cover, the book declares its computational orientation by presenting us with an array of hard-drives and circuit boards, suggesting a more apt title for the book might have been the *Logic of Computers.*

Elsewhere, while Evens is critical of such technologically determinate and formalist approaches to the digital, connecting it with "the actual objects and living culture that arise around digital technologies", he then goes on to argue that "the definitive tool of digital abstraction is the discrete code, typically binary code, which constitutes a bedrock of digital technologies" ("Web 2.0"). Although identifying the differentiated function of abstraction as that which defines the digital, Evens seems unable to see that he is simply replacing one form of determinism with another. Dismissing Lev Manovich's *database* as a formalist "organisational structure that characterises […] digital data", he simply replaced it with his own reading of "binary code both as the source of the digital's power and its defining feature" ("Web 2.0"). For Evens, computationally coded abstraction becomes the determining characteristic of being digital – one to which concepts such as 'pointing' must conform. In failing to question computational imperatives, Evens blinds himself to the underlying philosophical context that concerns Maley and, regardless of terms used, aligns himself with D. Lewis' "ordinary technological language". Thus I argue Evens' treatment of the term 'discrete', constrained as it is, offers a very limited account of digital ontology, one that is fundamentally determined by perceived computational imperatives and dismissive of broader philosophical considerations.[22]

Such considerations – while important – do not, however, inherently overcome such deterministic constraints as we see with Yuk Hui's *On the Existence of Digital Objects*. Although Hui's philosophical conceptualisation of the 'digital object' recognises the significance of

thinkers such as Leibniz and Martin Heidegger in a way that is consistent with the position adopted by this research, his adherence to the givens of the computational domain means that his ideas are never given license to be considered in an expanded field.[23] The reason for this is that in co-opting Gilbert Simondon's transductive method, he remains committed to a 'levels of abstraction' or an 'order of magnitude' conception of the digital. Taking *transduction* as a process of structural transformation across different domains places an emphasis on the relational,[24] which for Hui, following Simondon, leads to a disregard for the phenomeno-aesthetic possibilities of practice. Thus, while the arguments Hui constructs via this method develop out of similar philosophical concerns to those presented here,[25] his stated commitment to "incorporating both *technical* and philosophical thinking" comes at the cost of excluding possibilities presented by other approaches (*Existence of Digital Objects 32)*. In that Hui's methodological approach remains fundamentally of the mind, he does not allow himself to be informed by methods of 'practice' in the way this thesis has. Such methodological distinctions are significant and should not be overlooked, as they pose a fundamentally different set of questions.

Nevertheless, before these questions can emerge more fully, it is necessary to set out the philosophical groundwork in some detail. While this involves engaging with some complex and nuanced philosophical concepts, this opens the way for my focus here on the consideration of the digital as part of the 'expanded field' of artistic practice.

Artistic practice is framed here more specifically as 'sculptural', not because this reflects the dialectic reasoning of Rosalind Krauss's 'expanded field' that infinitely propagates practices in a quaternion field, but because, following subsequent postmodernist readings, the term 'sculpture' navigates the question of media such that practice is no longer "dictated by the conditions of a particular medium" (*Sculpture in*

the Expanded Field, 43). Reflecting a concern for such "post-media" systems aesthetics,[26] the *digital in the expanded field of sculptural practice* thus signals a practice that is unbounded or expanded, perhaps even flattened beyond the limits of media or object (*A Voyage on the North Sea*).[27]

This is not to say that the term 'sculpture' becomes a meaningless placeholder for an anything-goes, *not-not-media* of practice, but that by removing the contingency of medium, the question of what contingency applies is itself stretched to the point where it is drawn into question.[28]

It is, then, with this expanded or flattened practice in mind that we need to return to Lewis and look more closely at his definition of the digital, which further qualifies the digital as a "*representation* of numbers by differentiated multi-digital magnitudes" ("Analog and Digital" 327, my emphasis). Unlike Hui, who makes no mention of Lewis or differentiation,[29] Evens' approach is to see the digital as a representational function of code, rather than a fundamental ontological condition as described by Lewis. For Lewis, it is not a question of how bits represent, but how representations themselves can be differentiated or function discretely. Again, the reason for this is that Lewis – as an analytical philosopher committed to formal logic – is concerned primarily with the relationship between things and the methods that we use to represent them. The use of differentiation in Lewis' statement should thus be seen as a general statement of method as much as it is a statement specifically regarding digital ontology.[30] To this extent, it should be stressed that digital ontologies that fail to address the epistemic question of representation are missing at least half the point of what is meant by *differentiated representation*.

There are, then, *two* concepts in need of clarification in order to define the way in which the digital is to be treated here: what is meant by

differentiation, and why is representation seen as a necessary construct of it? As these are interrelated concepts, addressing one will to some extent inform the other; however, this does not imply an acceptance of both as being intrinsic to the digital. Although either question could be addressed first, we will begin with the issue of differentiation, as the representational questions arising from it, being fundamentally epistemic in nature, are more related to the methodological rationale addressed in Appendix 9, and the onto-epistemic questions addressed in Appendix 10.

The logical starting point for this is to engage directly with the subject of D. Lewis' paper that is in fact centred on a critique of Nelson Goodman's account of the digital as differentiated.[31] The basis of D. Lewis' argument is that Goodman misclassifies some analog representations as digital.[32] As well as providing a critique to Goodman's account, D. Lewis' paper is helpful in that it reflects his general resistance to Goodman's philosophical position. Between 1968 and 1991 D. Lewis wrote a number of papers addressing Goodman's work across a range of topics including logic structures (aufbau), universals (nominalism), and parts and wholes (mereology). As we will see, collectively these concepts interconnect to formulate Goodman's philosophical project. Because of the enormity of philosophical territory implicated by these topics, I will attempt to constrain the inquiry to the definition in question: *differentiated representation*. Inevitably, however, much more expansive ontological and epistemic questions are raised in the process than are possible to expand on fully here.

It is also important to acknowledge that while both D.Lewis and Goodman provide definitions of the analog by way of defining the digital, the approach taken here is quite different. In that it is a central methodological concern, an effort is made here to avoid counterfactual arguments such as those inherent in the analog/digital comparisons. Such dialectic approaches would seem to be a problematic means of defining discreteness.[33] For this reason discussion of the analog – defined

by Goodman as a being dense and continuous representation – is generally avoided in this thesis (*Languages of Art* 159-161).

In this context, then, how are we to see the difference between D. Lewis and Goodman? Daniel Cohnitz and Marcus Rossberg point out that while D. Lewis' critique of Goodman can be "construed as a development and an extension of Goodman's work…" (218), his position reflects a general division between Goodman and his contemporaries who promoted formal philosophical/logic systems that accepted universals as types or classes.[34] Understanding this point of difference and how it relates to the digital is seen as central to determining what is meant by *differentiated representation* because it marks a fundamental onto-epistemic distinction that calls into question the computational determinacy of the digital.

As the subtitle of Goodman's text *The Languages of Art: An Approach to a Theory of Symbols* suggests, through the emphasis placed on language and symbols, Goodman is fundamentally concerned with the question of phenomena and the representation of them. Like D. Lewis, he seeks to develop a formal logic for achieving this.[35] In this context the question of the differentiation between entities is not an empirical one but an epistemic one, concerned with the way in which we come to know and represent the phenomena to be differentiated. Thus D. Lewis' definition of the digital as a 'representation' should also be taken as a reflection of his epistemic position, given that his treatment of differentiation also stems from the method used to explicitly distinguish between parts. But it is the way in which each determines what constitutes a part within their worldview, that marks an important distinction. This has greater significance, though, than simply acknowledging the differences between Goodman and D. Lewis. It aligns each within different onto-epistemic arguments – arguments that privilege different conceptions of the digital.

In order to foreground the subsequent discussion, I will outline the basis of this difference here. While this will continue to be further informed as the ideas are explored, it should in no way be considered a full account of either Goodman's or D. Lewis' philosophical projects. Such exposition would be far outside the terms of reference for this research and the immediate question of digital practice as a mode of *differentiated representation*. In this regard, the key point of difference between Goodman and D. Lewis should be taken as mereological, meaning that each has a different approach to the question of how individuals are differentiated and wholes are constituted.[36]

Despite differences in treatment and his own personal equivocation on the matter, D. Lewis admits 'singletons' as one of these individual parts.[37] Although admitting to a degree of indecision about exactly what constitutes a singleton, D. Lewis admits it as a "legitimate primitive" – meaning that he considered it to be an entity in which it is the only part of itself (*Parts of Classes* ix).[38] Regardless of further arguments that could be used to clarify this, it is sufficient for our purposes here to take the singleton as a class that has only itself as a member (D. Lewis, *Parts of Classes* 30). While classes are typically taken as collections of individuals, the singleton is considered to be a special case of a class. On this basis, its status as an individual is justified. And here sits the significant point of difference that concerns us.

In contrast to D. Lewis, Goodman is adamant that classes – even special cases of them – do not constitute individuals, and thus the notion of the singleton is a contradiction. As a consequence of the nominalism that he sets out, abstract objects, and in particular the ones required by mathematics, are discounted (*Structure of Appearance* 105).[39] In fact Goodman explicitly rules out classes for the very reason they are intended to resolve: the paradoxes caused by infinite class recursion.[40]

It is argued in this thesis that this rationale holds far greater weight than D. Lewis' acquiescent acceptance of singletons on the ground that it would be presumptuous "to reject mathematics for philosophical reasons" (*Parts of Classes* 59). But this clearly defined point of difference has greater significance than simply serving to differentiate between two particular arguments. As D. Lewis acknowledges, "mathematics is into set theory up to its ears" (*Parts of Classes* 58). But further to this, mathematical treatment of set theory is also deeply rooted in computer science as Alan Kay certifies when he describes the *Smalltalk* schema as "implying that classes are objects and that they must be instances of themselves" (28). While this connection is clearly evident in computational constructs such as instantiation and encapsulation, which utilize set theory as part of their data structures, it again highlights the contradiction presented in Kay's OOP interpretation of Leibniz' monad as a self contained entity.[41]

Despite their common concerns, Goodman and D. Lewis are thus seen as representing two very different interpretations of "differentiated representation". Such approaches might be considered simply as being different 'world versions' – a concept developed later with regard to Goodman.[42] Thus while this difference serves as the key point of entry into the research, it should be clear that articulation of this difference is intended to *clarify* not deny: no argument is made regarding the digital status of computation on the basis of its mereological framework.[43] Rather, by developing a fuller understanding of what constitutes a *differentiated representation,* I aim to clarify what it is that makes something digital in the expanded ontological field of artistic practice.[44]

While considering the implications this has on sculptural practice is of primary concern here, it is worth establishing terms for this. Although questions of mimesis arise as an inevitable consequence of differentiation, unlike Arthur Danto I believe that Goodman's mereology resolves this in non-semantic terms. Danto's criticism of Goodman in this

regard is that he "considers only the semantic proposition", and ignores the denotive function of art (147). This, I suggest, is a narrow reading that ignores what Goodman refers to as the "showing forth" of art: a concept that resonates with notions of *bringing forth* that are developed in Appendix 9 (*Languages of Art* 253; *Ways of Worldmaking* 65). From this it might reasonably be taken, then, that this research is biased towards the act of digital *practice* – the practice of differentiation, rather than digital object per se.[45] The question of what the digital is, then, might be thought about as the question of *how* a part is apart from other parts rather than *what* a part is, although as we will see this distinction is far from clear.

It is, then, Goodman's position rather than D. Lewis' that is the initial focus of this text. As Goodman's arguments are dense and interwoven it seems necessary to unpack them in some detail to develop an adequate terms of reference. The major challenge in doing this, however, is not explaining the complexity of his ideas but maintaining a consistent framework for his position as it straddles – perhaps even transgresses – established philosophical doctrines.[46] In anticipation of what might at times seem like a contradictory position, the guiding tenet that is maintained throughout the discussion of his work is that, regardless of other affiliations, he is consistently 'phenomenalist' in his commitment to representation.[47] However, as will eventually be explained, this itself presents difficulties with regard to Goodman's definition of the digital.

8.3.1 **X is not a dog**

Although Goodman is meticulous in laying out his methods, the level of detail with which, using logic statements, he develops simple language propositions such as "Something is not an *A*" into the formal logic statement $(\exists x)(\exists y)(\exists z(x \neq y.\ y \neq z.\ x \neq z.\ (w)(Aw \equiv: w = x.\supset.\ W = y.\supset.\ w = z))$,[48] does not serve much purpose here. We are concerned simply with the philosophical implications of using things such as predicate logic to

define the relationship between discrete entities, rather than the implementation of that logic per se (Goodman, "Steps Toward a Constructive Nominalism" 108).[49] Similarly, the implementation of set theory[50] – derived in part from formal logic with which Goodman is often associated[51] – is in itself not of direct concern here either, although the reason for it *not* being is. That said, laying out Goodman's position is not a simple task. Although Goodman extends Carnap's notion of Aufbau[52] and his work – as noted previously, developed in the context of other logicians such as Bertrand Russell, Alfred North Whitehead – he is also clearly distinct from them with regard to the question of what is admitted as a discrete entity.[53] It is these differences and how they clarify the notion of the digital that are the initial focus for the thesis, more than the work of Goodman per se. [54]

Thus, rather than approaching this task by addressing Goodman's response to David Hume's solution to the problem of inductive reasoning,[55] I will start with the fundamental ontological problem of how discrete parts relate to wholes within Goodman's *mereological* theory. The primary challenge in developing this theory is identified by Goodman and Henry Leonard, as being the difficulty of determining "which entities are to be construed as individuals and which as classes" ("Calculus of Individuals" 45).[56] Goodman and Leonard attempt to do this by advancing a formal logic syntax. It is important to note at the outset that Goodman is not approaching this from an epistemic perspective which seeks to determine how we know what an object is. Rather, he is concerned with how abstract methods construct individuals and types.[57] Phrased in this way it is easy to understand how Goodman's work might relate to the object and class constructs that programming derives from set theory. The relationship between set theory and predicate logic is the assumption that, in both, predicates determine a class or set. Thus a *black-dog* is defined as a class and is differentiated from *dogs* in general by the predicate *black*.

However closely set theory and mathematical axiom are interrelated through the syntax of predicate logic, the theory of sets is, I suggest, fundamentally a mereological question – one that can be used to address the question of discreteness.[58] But despite sharing a common mereological focus, set theory – taken as making an argument for classes as objects in their own right – seemingly sits in opposition to Goodman's nominalism.[59] Thus, while the relationship between classes and individuals is pertinent, set theory as the foundational logic of computer science is not. While set theory may be a useful way of understanding the digital in terms of computation, it does not follow that the digital can only be approached though set theory. This, I argue, is the underlying assumption evident in Evens' approach to the digital and leads to computational determinism. Hence it is the distinction between Goodman's mereology and set theory that is important to understand. The point of difference is the way in which paradoxes in deductive systems arising from the use of predicate logic determine how discrete entities are defined.

The task of developing a formal deductive system, as established by Gotlob Frege, was to establish an explicit epistemic foundation for reality, such that any assumptions could be identified: "Because there are no gaps in the chains of inference, every 'axiom', every 'assumption', 'hypothesis', or whatever you wish to call it, upon which a proof is based is brought to light; and in this way we gain a basis upon which to judge the epistemological nature of the law that is proved" (Frege, *Basic Laws* 3). Although the method developed by Frege made a significant contribution to formal logic, it also presented unresolved paradoxes in the construction of self-referential logic statements as subsequently identified by Bertrand Russell in a letter to Frege:[60]

> You state that a function too can act as an indeterminate element. This I formerly believed, but now this view seems doubtful to me because of the following contradiction. Let w be the

> predicate: to be a predicate that cannot be predicated of itself. Therefore, we must conclude that w is not a predicate. Likewise, there is no class (as a totality) of those classes which, each taken as a totality, do not belong to themselves. From this I conclude that under certain circumstances a definable collection [Menge] does not form a totality. (Russell in Van Heijenoort, *Frege to Gödel* 124-125)

The same statement is expressed in symbolic form in the postscript of the letter as: "w = cls ∩ xϽ (x ~ εx) . □ wεw . = . w ~ εw" (*Frege to Gödel* 125).[61] However, to avoid unnecessary elaboration on the constructs of formal logic it is perhaps easier to understand this through a simple example: "The set of all dogs is not, itself, a dog. Thus the set dog does not contain itself as a member. On the other hand, the set of all things that are *not* dogs is also not a dog. Thus the set non dogs *does* seem to contain itself as a member – since the set of nondogs is non dog" (Shenefelt and White, 234). This then is the so-called Russell Paradox which presents the contradiction that formal logic poses to itself that: If it does, then it doesn't, and yet if it doesn't, then it does.[62] Although in concrete examples such as the set of dogs, the paradox might seem to be merely a semantic problem, when extended to infinitely large sets such as *everything that there is in the universe*, Frege's goal of formalising a logical epistemic method is shown to be contradictory as the method falls short of being axiomatically valid.

Although subsequent solutions to Russell's Paradox have been *mathematically* satisfied, this is not the point here, as I am not attempting to mount a critique of formal logic or indeed set theory.[63] The point with regard to the construct of discrete individuals is to understand why it is that Goodman rejects Russell's solution, and in what terms he then defines an individual entity as being discrete within logical frameworks. Russell's solution to the paradox was to establish a hierarchy of classes that limits inheritance between individuals and sets. His *Theory of Types* –

developed in *the Principles of Mathematics* with Alfred North Whitehead, avoids the problems of self-referential classes that can never be members of themselves by distinguishing between abstract class concepts and physical objects.[64] This distinction forms *types* that operate under different logical axioms and prevents a class from containing itself as a member (Whitehead and Russell, *Principia Mathematica* 39-68). But in order to make this distinction Russell and Whitehead must admit classes as individual entities in their own right:

> An analysis of the paradoxes to be avoided shows that they all result from a kind of vicious circle. The vicious circles in question arise from supposing that a collection of objects may contain members which can only be defined by means of the collection as a whole. Thus, for example, the collection of *propositions* will be supposed to contain a proposition stating that "all propositions are either true or false." It would seem, however, that such a statement could not be legitimate unless "all propositions" referred to some already definite collection, which it cannot do if new propositions are created by statements about "all propositions." We shall, therefore, have to say that statements about "all propositions" are meaningless. … The principle which enables us to avoid illegitimate totalities may be stated as follows: "Whatever involves *all* of a collection must not be one of the collection"; or, conversely: "If, provided a certain collection had a total, it would have members only definable in terms of that total, then the said collection has no total." We shall call this the "vicious-circle principle," because it enables us to avoid the vicious circles involved in the assumption of illegitimate totalities. (Whitehead and Russell, *Principia Mathematica* 37)

Goodman sets out his opposition to this in "Steps Toward a Constructive Nominalism", of 1947. Written in conjunction with Willard Van Orman Quine, the two declare that they "do not believe in abstract entities. No

one supposes that abstract entities – classes, relations, properties, etc. – exist in space-time; but we mean more than this. We renounce them altogether" (*Steps Towards a Constructive Nominalism* 105). Although they are not named in this provocative statement, this is clearly a critique of arguments such as those put forward by Russell and Whitehead as well as those proposed by Ernst Zermelo and Abraham Franenke whose axiomatic set theory went on to gain general acceptance as the basis of set theory (Winskel, 4).[65]

In rejecting the "abstract objects that mathematics needs", Goodman and Quine might seem to identify themselves as realists, especially given Goodman's stated commitment to methods of representing phenomena (*Steps Towards a Constructive Nominalism* 105). If this was the case, the difference between Goodman and D. Lewis' definition of the digital might simply be taken as slight variations of realist epistemologies.[66] However, after rejecting abstract entities, Goodman and Quine go on to admit entities that are "predicates of concrete individuals or explained in terms of predicates of concrete individuals" (*Steps Towards a Constructive Nominalism* 106). In other words, x is okay if it is used in the logic statement "x is a dog"; however, x as an entity in itself is not (*Steps Towards a Constructive Nominalism* 105). Having emphatically rejected abstract entities a few sentences earlier, Goodman and Quine now seem to contradict themselves by allowing *some* types of non-concrete objects. But rather than being a fuzzy concession to mathematical needs, this is a nuance that distinguishes Goodman's nominalism from other forms of nominalism and highlights the key point of difference from Russell.[67]

Before expanding on this it is necessary to point out that shortly after publishing their joint paper Quine recanted his opposition to abstract entities, acknowledging that classes were in fact indispensable (*Theories and Things* 100).[68] Goodman, however, maintained his position and continued to argue against the inclusion of classes and sets in logic

statements.[69] Goodman reflects on this difference, noting that "from the beginning, our formulations of the basic principles of nominalism differed. For Quine, nominalism could countenance nothing abstract but only concrete physical objects. For me nominalism could countenance no classes, but only individuals" (*Of Mind and Other Matters* 50-51). Because Quine quickly distanced himself from the arguments made in "Steps Toward a Constructive Nominalism", it seems insincere to represent him through this text and more appropriate to continue the discussion with reference to Goodman alone.

Goodman develops his nominalology by rethinking classic assumptions about predicate arguments and rephrasing them as simple language "statements about concrete objects" (*Steps Towards a Constructive Nominalism* 107). Thus the statement "Class *A* is included in Class *B* may be rephrased as: Everything that is an *A* is a *B*" (*Steps Towards a Constructive Nominalism* 107). While following formal logic but operating within a different syntactical structure, 'is an A' and 'is a B' no longer operate as statements about classes or instances of objects but as entities in themselves.[70] As Daniel Cohnitz and Marcus Rossberg summarise: "Thus '*a* is red' requires no more than that *a* exists, and that it is red. No universal property *redness* is required that *a* instantiates and that 'is *a* red' refers to; "a is red' merely requires that 'is red is true of *a*" (80). In this example it is not only evident why '*a*' can be treated as a concrete entity despite having no material objects to name, but it should also be clear how syntax operates in conjunction with the predicate to construct a 'world vision': while syntax is conditional on the predicate, the two are causally co-determinant in constituting entities.

8.3.2 **Differentiation and Discreteness**

Before continuing to consider the syntactical implications of "worldmaking" – the constructional system mentioned earlier through which versions or realities are produced within Goodman's philosophical

framework – I want to go back and consider what has been presented so far regarding Goodman in relation to Leibniz's monads as identified by Kay.[71]

As should be evident, the basic construct of the monad as a self-contained entity shares things in common with Goodman's mereological nominalism. As Nicholas Rescher notes, Leibniz "would surely have viewed with approval and encouragement the efforts by Nelson Goodman" (25). Leibniz's construct of the monad as a *simple substance* that is taken to be 'true' in the sense that subject and predicate are bound together, is directly comparable to the co-determinacy of Goodman's syntax predicate argument. Differentiation can thus be taken as a method of *relating* between a subject and its quale, as opposed to discreteness which is taken as an empirical condition of a subject.[72] However, while the monadic method of this *relating* results in what I have referred to as self-actualizing individuals that rebound off themselves as concomitant entities, the methods by which Goodman and Leibniz arrive at this point, and how these articulate differentiation, are clearly different.

For Leibniz the indivisibility of monads – which is held in its subject-predicate relation – is reliant on the *deductive* reasoning that composites must be made up of discrete individuals, whereas Goodman's *inductive* reasoning denies the existence of such composite elements – or sets[73] – as they would lead down the path of infinite regression to Russell's Paradox and suggest that two distinct entities can be identical without them being the same thing.[74] This is a significant point of difference as it highlights the distinction between the assumptions of computational discreteness and Goodman's nomological definition of differentiation.

Kay's discussion of *SmallTalk* and subsequent discussions of the digital in discrete terms as exemplified by Evens, are generally in agreement with

Leibniz's deductive reasoning, whether they know it or not. Following Kay, Evens' reasoning for code as being the definitive characteristic of the digital is that it inductively accepts what he calls "the integrity of the inside" that "makes it possible to treat objects as internal, as entities that allow their manipulation as individuals" though structures such as inheritance (*Logic of the Digital* 34). In positioning the digital in this way, Evens resolves the question of infinite recursion by reasoning that rests on an ontology in which the internal function of the *bit* divorces itself from the materiality of its own space and time in such a way that digital 'objects' can be instantiated multiple times (*Logic of the Digital* 31).[75] Sounding like familiar media narratives, Evens rarefies the digital through the interface which allows computer technologies to divorce themselves from materiality and transcend to the apotheosis of possibility in which discreteness is a class construct in itself – a construct that through infinite recursion inherently contains itself as a member.

While Kay's proposition that OOP mirrors the affordances of physical objects might be the case in a monadic sense, it is clearly not the case if taken from Goodman's nominalist perspective. Whereas Kay conceives of monads as discrete entities by virtue of their being completely self describing, nominalist objects, as defined by Goodman, can be predicates depending on the syntax of the structure they operate in and which they in turn inform. In OOP the *dog is black* by virtue of the colour variable that holds the value black, but might be just as easily white or any other colour.[76] The OOP black dog is in fact *a* dog that happens to be black in this instance of a dog. On the other hand, the nominalist *black-dog* is a dog which is seen as having the phenomenal of being black: black exists as an abstract predicate but only within the syntax of the statement that requires no more than the dog exists and the colour black exists, to be satisfied.

While it is convenient to think of the OOP structures and objects metaphorically with regard to physical objects, I suggest this is a

representational device that – like the metaphor of the desktop interface – only serves to distance the digital from the question of how discrete entities can contain themselves without evoking Russell's Paradox. Although I do not doubt the accuracy of Kay's account regarding the origins of *SmallTalk*, the contribution of the mathematical constructs proposed in response to Russell's paradox should not be overlooked. As Schwartz et al. document in *Computational Logic for Set Theory*, mathematical principles such as Russell and Whitehead's *Theory of Types* and Zermelo and Franenk's axiomatic set theory have essentially the same significance for computer science as they do for set theory (2001).[77] This connection becomes all the more significant in the context of Goodman's critique of Russell and Whitehead, for it acknowledges a further point of distinction between D. Lewis' definition of the digital and Goodman's.

Unlike D. Lewis, Goodman's account of the digital develops over the course of several key texts.[78] While in *Reconnections in Philosophy and other Arts and Sciences,* Goodman links the digital to representation, *both* the analog and digital are first defined as part of a mereological schema in *The Languages of Art*. As Goodman's definition is taken as the primary text here it is worth quoting key passages directly:

> A symbols *schema* is analog if syntactically dense; a *system* is analog if syntactically and semantically dense. Analog systems are thus both syntactically and semantically undifferentiated in the extreme. (*Languages of Art* 160)
>
> To be digital a system must not merely be discontinuous but *differentiated* throughout, syntactically and semantically. (*Languages of Art* 161)
>
> Differentiation as here construed is not a familiar notion, but the differentiated is enough akin to the digital that a scheme

> differentiated throughout – that is, such that every two of its characters are effectively differentiated – may be called digital. (*Reconceptions in Philosophy* 126)

> We may merely distinguish as analog […] schemes such that between each two characters there is in the scheme a path of pairs of non differentiated characters; that is, such that each two characters are related by the ancestral of non differentiation in the scheme. (*Reconceptions in Philosophy* 126)

There are several points worth noting here as they pertain to the argument that will be developed. Firstly, unlike D. Lewis who defines "digital representation", Goodman doesn't use the two words in this combination ("Analog and Digital" 325-327). D. Lewis's summation is, not an inaccurate reflection of Goodman's argument but, as we will see, the connection between representation and the digital is also deeply intertwined with Goodman's larger philosophical agenda.

While Goodman's position regarding the admission of classes as discrete entities has been made clear, D. Lewis' account has perhaps not. The reason for this is that D. Lewis is primarily mounting a critique of Goodman and only comes to his own definition towards the end of his paper, saying that what defines digital representation is not differentiation but combinations of differentiated values ("Analog and Digital" 326). In other words, for D. Lewis the digital is a set of discrete entities – as we see in the construct of bytes from bits, the bit being the smallest atomic computational unit and the byte being a set of eight bits.[79] In making this assertion, D. Lewis resolves the question of differentiation by admitting sets or classes of objects as discrete entities and thus reinforces the principle of axiomatic set theory. Goodman would clearly have objected to this on the grounds that the admission of abstract classes inevitably leads to paradoxes ("Steps Toward a Constructive Nominalism" 105).

We have, then, two opposing 'world versions': interpretations that while using the same term – differentiation – imply quite different things. D. Lewis' version – invested in mathematical constructs that culminate in the application of set theory within computer science – admits constructed combinations of things as discrete entities. On the other hand, Goodman's treatment – which admits abstract entities but not assemblages – provides an ontological axiom that, through logic, propositions transcend computational constrained definitions of the digital. Reconciling this difference however, is not necessarily a matter of refuting one by proving it to be false. Rather, such opposing frameworks can be understood within the construct of Goodman's *Ways of Worldmaking* that is concerned only with relative "rightness".

8.4 **World Making**

As mereology requires a means of determining what is a part in order that it might be placed within the whole, Goodman's interest in the digital and the reason for him defining it as being differentiated is clear: only individual entities provide a means for resolving Russell's Paradox, whereas composite entities such as classes or sets compound the paradox and demand infinite succession of sets in which to contain themselves. If we accept composite entities outside of our construct of them then we accept infinite regression. Goodman explains the grounds for his opposition to this in "Steps Toward a Constructive Nominalism": "We decline to assume that there are infinitely many objects[…] If in fact the concrete world is finite, acceptance of any theory that presupposes infinity would require us to assume that in addition to the concrete objects, finite in number, there are also abstract entities" ("Steps Toward a Constructive Nominalism" 106).[80] While it is important to address the issue of finitude it needs to be understood first in the context of

worldmaking.[81] Catherine Elgin explains *worldmaking* succinctly saying that:

> … worlds and the items they contain are made rather than found. They are made by the construction of world versions – symbol systems that supply structure. Any two items are alike in some respects and different in others, so inspection alone cannot reveal whether two manifestations are of the same thing or two things are of the same kind. To decide that requires knowing what it takes to be the same thing or the same kind of thing. We need criteria of individuation and classification to distinguish differences that matter, from differences that do not. Nature does not supply them. By devising category schemes or systems of classification, we decide where to draw the lines. (Elgin, "Worldmaker" 10)

The point Elgin addresses here is that these systems of classification are the thing that determines individuation and define differentiation.[82] Furthermore it is clear that this implies there are multiple systems or, as Goodman calls them, *world-versions,* and, even though they may be competing versions – as is the case identified here in regard to the definition of the digital – they are equally 'right' within the syntax of their *world-version*. Such pluralism discredits neither and is the reason for Goodman questioning the absolute validity of deductively derived 'truth' statements in preference for the relative 'rightness' of inductive statements. Goodman also argues that inductive 'rightness' makes claims beyond 'truth' statements as it is *projectable*[83]: that they can be used as generalised rules. Thus the question of 'truth' rests on the question of which predicates within a statement are *projectable*. This, he argues, is a question of the world in which they are situated.[84]

To relate this back to the principles of predicate logic: the relation between the dog and the predicate black should be understood as a *world-version* rather than a 'truth'. In another world-version – one in

which the dog is *grue* not black – the predicate *grue* is considered equally 'right'.[85] The point being that having multiple definitions of the same thing is not contradictory as they are constructs of different world-versions. This is neither an idealist or a realist argument but what Goodman calls irrealism or "radical relativism", a term intended to avoid 'irresponsible relativism' in which all statements are taken as being equally true (*Ways of Worldmaking* 94). This might seem to contradict Goodman's version of nominalism in that it seems to perpetuate classes of *world-version*. However, as Goodman explains:

> Although a nominalistic system speaks only of individuals, banning all talk of classes, it may take anything whatever as an individual; that is, the nominalistic prohibition is against the profligate propagation of entities out of any chosen basis of individuals, but leaves choice of the basis quite free. Nominalism of itself thus authorises an abundance of alternative versions based on physical particles or phenomenal elements or ordinary things or whatever else one is willing to take as individuals. Nothing here prevents any given nominalist from preferring on other grounds some among the systems thus recognised as legitimate. (*Ways of Worldmaking* 94-95)

As indicated earlier, these world-versions are not solely determinant of what they include and exclude. Rather, the dynamic between semantic content and the syntactical system is concomitant: "A world-version must consist of components that fit together" (Elgin, "Worldmaker" 12). If semantic content and syntax don't 'fit' then they have no 'rightness' and do not construct a *world-version*. It is the coherence of semantic content and syntactic structure that defines the 'rightness' of the systems that construct different world-versions.[86] Goodman defines the five requirements of such systems as: character-indifference,[87] syntactic finite articulation,[88] unambiguity,[89] semantic disjointness[90] and semantic finite differentiation (*Languages of Art)*.[91] While Goodman gives a full account of his "Theory of Notation" in *The Languages of Art,* the importance of

this here is that it clarifies why differentiation is important to Goodman at all.

Defining continuity (analog representation), along with differentiation (digital representation), is central to Goodman's entire nominalogical argument because the way in which parts combine (the syntax), together with the parts themselves (the semantic content), defines the *world-version* and thus the 'rightness' of an argument.

Although Goodman and D. Lewis are both concerned with questions of mereological composition, these appear to come from two totally different world positions with regard to the same subject. While not making a direct comparison between Goodman and D. Lewis, John Burgess frames this succinctly as the difference "between mereology, the general theory of parts, and set theory, the general theory of collection" (459). The perspective shift is clear – one assumes the whole, the other the part – but these can also be taken as reflecting spatial orientation towards the problem: one looking in; the other looking out. [92] But most significantly it confirms the allegiances established earlier with regard to set theory.

It is tempting to think of D. Lewis and Goodman's definitions of the digital as simply different *world-versions* that, although premised in "opposing philosophical attitudes or convictions, do not themselves necessarily conflict" (Goodman, *Structure of Appearance* 100). In many ways this approach serves the purposes of the argument made here: rather than contesting the validity of computationally constrained definitions of the digital, it draws into consideration the prospect of a much broader digital ontology. It asks what else the digital might be in addition to, rather than in place of, the techno-computational. As Goodman suggests "digital systems may have objects or events of any kind" and thus need not have anything to do with *digits* or computers as argued by Evens (*Languages of Art* 160). However, much as this reflects the stance

taken here, it would be inaccurate to represent Goodman's *world-version* construct as being a loose, anything-goes relativity, for his notational theory specifically rules out computational constructs of the digital in the terms conceived of through the discrete logic of code and set theory. That the digital has become synonymous with technology would, for Goodman, simply be "a matter of habit – a matter of fact rather than fiat" (*Languages of Art* 89).

Thus, although Goodman is relativistic in some regards, he is absolutist in his nominalist rejection of classes. The reason for this resides in the way that classes are distinguished from individuals. As discussed previously, the computational relies on set theory in which, following the example used earlier, *black-dogs* are defined as being an individual class in itself. This, according to Goodman, is untenable as it creates a paradox of a set or class that contains itself and is only resolvable by the *infinite* regression and propagation of further sets.[93] In short, in rejecting classes Goodman must reject the notion of the computational digital as a possible *world-version* because its syntax and semantics do not function in accordance with his theory of notation. This is a significant criticism as it uses the argument's own logic – it might even be argued an exemplary version of that logic – as the basis for discrediting it. The resulting paradox is only removed by either abandoning formal logic – something neither set theory of notational theory can do – or by accepting a finite universe: if the universe is finite we eventually run out of things that need to have a class defined for them. As this problem draws into consideration issues beyond Goodman's immediate framework, we will put it aside for now and return to it in Appendix 10.

8.5 **Making Representation**

At this point, while we have clarified relevant positions regarding differentiation, the question of representation also needs to addressed in order to refine our understanding of the digital. Representation is

important to address here not just because it is part of both Goodman and D. Lewis' definition, but because the act of representation addresses the subjects of differentiation – the objects that are being differentiated. I stress this point because, given that this thesis is concerned with understanding the digital within sculptural/art *practice,* the question of representation might be taken singularly as the question regarding visual resemblance or depiction. Considering the proliferation of so called 'digital images' though photographic, video, 3D printing and virtual reality technologies, it might thus seem necessary to address representation in terms of mimesis. This is not directly relevant here as the question concerns differentiation, not fidelity. Further to that, the question is about the *act* of differentiation, not the qualities of difference. While on both these counts issues of iconicity are not of direct concern here, it's perhaps useful to frame them in terms of the debate between Goodman and E. H. Gombrich concerning the question of "fidelity to what?" (Gombrich, "The 'What' and the'How'" 129). Although this debate was centred on Goodman's rejection of perspective in *Languages of Art,* Gombrich *conceding to* Goodman frames the point I am trying to make as being the difference between the "what" and the "how" of representation and phenomena (Goodman, *Languages of Art*; Gombrich, "The 'What' and the'How'"). From the preceding discussion of *world-versions* it should be evident that Goodman is not concerned with the 'truth' of what things are. Rather, the syntactical basis of his mereology emphasises the *how* of versioning worlds. A broader framework for considering the confusion identified here is provided by Joseph Margolis who articulates it as the difference between "the phenomenal and the phenomenological"(37).[94] This leads us to understand that the question of representation pertains to the phenomenological *event* of perception as a *how* of differentiation, rather than the phenomenal *what* of fidelity. *Representations are events made not objects given.* As the argument unfolds in subsequent sections, the significance of this will become apparent as it anticipates an ontological turn that directs subsequent sections of this thesis.

This does not mean, however, that the question of representation is unproblematic. In fact, I argue, Goodman's fixation on representation is contradictory when combined with individuated differentiation because of its metaontological construct. Metaontology – being concerned with how the relationship between ontologies helps determine which entities can be classified as fundamental entities – operates here at two levels.[95] Firstly, *world-version* representations have the effect of instantiating phenomena as individual entities. The phenomenalist representation of a black-dog is not *the* black-dog itself but an instance or a *world-version*. But further to that all dogs, birds, and for that matter made-up entities such as unicorns[96] are phenomenal instantiations of a class called 'Representation'. Each *world-version* is effectively just a different class of representation. Effectively metaontological *world-versions* relations define the way in which phenomena are *sorted*.[97] On the other hand, to remain differentiated, individual entities must also maintain a metaontologicaly unsorted flat structure or they become sorted – in which case they are no longer individuated but classes.

In Goodman's own terms the predicate combination of differentiation and representation seems to unify two incompatible ontologies: a thing cannot be both individual and represented, as in being represented they are no longer fully differentiated. It appears that insisting on representation as a predicate to differentiation presents exactly the same logic paradoxes as the problem of induction. To relate this back to the Russell Paradox quoted earlier, 'representation' can be substituted into the logic statement using *r* in place or *w*.[98] Russell's statement now reads: "Let *[r]* be the predicate: to be predicate that cannot be predicate of itself. Therefore, we must conclude that [r*]* is not a predicate" (Russell in Van Heijenoort, *Frege to Gödel* 124-125). If we admit the class 'Representation' then we need a further class to contain it, which accordingly must also be a representation. Again appropriating Russell: "From this I conclude that under certain circumstances a

[representation] does not form an [individual]" (Russell in Van Heijenoort, *Frege to Gödel* 124-125).[99]

As there can be no class of all classes without infinite recursion, and no differentiation between individuals under the infinite recursions of classes of representation, it initially seems that we are forced to admit classes or reject representation as a predicate for differentiation, or find an alternative to the analogy of representation.

8.5.1 **Digital Representations**

At the start of section 8.3 – *Discreteness and Differentiation* – Goodman is quoted regarding the distinction between the analog and the digital.[100] In the discussion thus far, the analog has largely been ignored as we have focussed on the task of defining the digital in itself. However, I want to return to it now, not to define the digital as an antithetical counterpart to the analog, but to consider the implications of Goodman's advocacy for the dissociation of the analog from analogy in favour of density.[101] While Goodman tells us that "digital systems have nothing special to do with the digits" he also asserts that analog systems have nothing to do with analogy (*Languages of Art* 160). There is no need to labour the 'looseness' of the analog-analogy which Goodman has already dismissed for us.[102] Rather, I want to briefly consider the implications of conceiving of the analog as a dense representation, so that we can consider what it would take to differentiate without the need for either representation or antithetical comparison.

Philosopher-artist Ellie Epp's discussion of D. Lewis is a helpful point of entry here, as she points out the implications of D. Lewis' use of the term *magnitude* to describe both the digital and analog.[103] Epp points out that "describing a pattern of magnitudes is no straightforward matter, and this complexity is what differentiates digital from analog representation" (Epp).[104] Despite this complexity, the concept can be

treated here as a relatively simple *level-of-abstraction* issue that is applicable to both Goodman's and D. Lewis' arguments .[105]

For D. Lewis, *primitive magnitudes* are *dense* analog representations that are in accordance with a particular *syntax* – or *world-version*.[106] In contrast to the analog, D. Lewis articulates *digital* representations as *differentiated multi-digit magnitudes* ("Analog and Digital" 327), meaning they are one entity made up of a *set* of *unidigital* 0s and 1s, not just an *individually* differentiated or uni-digital entity – the latter being consistent with Goodman's mereology. For D. Lewis, both analog and digital are forms of magnitude and groupings of magnitudes. Both are clearly incompatible with Goodman's nominalism which rejects composite groupings as individual entities.[107]

Regardless of the comparative distinctions that D. Lewis makes, both the analog and the digital are reduced to degrees of magnitude within the *same* system. As Epp concludes, the consequence of defining the analog/digital in this way "is that analog computers will also be classed as digital, to the extent that we view them as representing and computing" (Epp). Inverting the logic of this statement, we might say that the way in which an entity (a computer) represents, determines whether it is analog or digital. Thus, the distinction between analog and digital effectively becomes a matter of fidelity, determined by the representational syntax. Goodman's definition of the analog as dense is not much different, as it also creates a scale between one and many, between density and differentiation, such that the analog and digital are not conceived of as opposites (*Languages of Art* 160). Density is thus also seen as an order of magnitude or *level-of-abstraction* of individual digits.

Philosopher Luciano Floridi uses this to argue against a digital ontology in which "the ultimate nature of reality is digital", by emphasising that levels-of-abstraction make reality determinate on the epistemic agent

modelling it ("Against Digital Ontology" 160). Floridi's agenda here is to discredit 'its from bits' ontologies, such as those forwarded by James Wheeler – which in this instance might also apply to Goodman and D. Lewis' mereologies – and to promote a form of *informational realism* that, while being mind-*independent*, is curiously dependent on epistemic agency. Floridi asserts that such arguments highlight the inherent limitations of making onto-epistimic claims, and opens up the potential for challenging ontological assumptions that presuppose antithetical positioning.

The concatenation of "differentiated representation" under these terms is then problematic in multiple ways. In section 8.5 it was argued that an entity cannot be digital if it is also a representation, and that treating representation as an occurrence of a class results in an unresolvable paradox akin to the Russell Paradox. In addition, representation – as used by both D. Lewis and Goodman – eliminates any meaningful distinction between the analog and digital as it reduces them to degrees of magnitude. Following Floridi, the difficulty is that as such magnitudes are predicated on the epistemological condition of the modelling agent, and thus representations by degree cannot be considered discrete in themselves. Statements of degree infer a syntactical condition more than a semantic state, thus placing objects on a scale of difference rather than defining an absolute ontological condition. D. Lewis and Goodman's comparative definitions of the analog and digital are then not so much statements of the ontological condition, but rather epistemic states. Such graduated antithetical distinctions thus seem problematic when it comes to determining a discrete ontology.

An alternative might be to solipsistically isolate everything so that the need for, or possibility of, any form of representation is denied. But this, Goodman argues, is not practicable as even things which claim not to represent do so. Arguing against the "pure in art", by which he means art that is concerned with its own intrinsic condition, Goodman suggests

that even purely abstract paintings that claim to represent nothing external to themselves, are in fact representational through what he calls their "show forth" function – their ability to exemplify or represent qualities that are not inherent within the painting itself (*Ways of Worldmaking* 56-59 and 63-65).[108] Under this rationale, every painting and, for that matter, all art – regardless of its resemblance to anything else – is seen as symbolic through either its internal content or its external exemplary function.[109] Although not fully developed by Goodman, the concept of *showing forth* – which should be seen as a logical extension of his subject/predicate and world-version construct, enables a significant shift in thinking about differentiation to occur. Through this, the emphasis here moves away from antithetical subject/object approaches that have been struggling to position the digital discretely without recourse to representation, towards the conception of differentiation as onto-epistemic concatenation that is itself that which is differentiated.

I have taken time to outline these points here for two reasons. Firstly to point out how, in reducing everything to a form of representation, differentiation becomes a paradoxical condition that can only be resolved by acceptance of the contingency that there is nothing outside of representation. And secondly because – in suggesting that ontology might be conceived of as a verb practised, rather than an object named – the undeveloped concept of *showing forth* signals an alternative to antithetical conceptions of subject-object that make representation inevitable.[110] As we continue to develop such alternate onto-epistemological propositions with regard to the digital, the challenge is to resist these oppositional frameworks. This, however, should not be taken as simply pursuing another form of monism by way of contriving an irreducible digit-ana-logue. The challenge instead is to think about how onto-epistemic subjectivity itself functions in regard to materiality and differentiation within a digital practice.

8.5.2 **Representation Between Bounces**

In light of this onto-epistemic challenge, the representational aspect of Goodman and D. Lewis' definition assumes greater clarity, but it also gains additional significance: it is really no surprise that the mathematical formulation of logic statements leads to a representational definition of the digital. But also – to make the connection back to Floridi – such formulations are seen as levels-of-abstraction that epistemically filter subjects and as such are representations in the sense they are mind-dependent. Such formulations reinforce dualist approaches that ontologically separate subjects and objects, as subjects in themselves are assumed to be unknowable to the mind. Within such epistemic constructs it seems reasonable to persist with such dualist interpretations, and continue treating the analog and the digital as distinct ontologies. However, if we take on board onto-epistemic alternatives such as those implied by the concept of *showing forth,* the underlying subject-object distinctions are called into question in a manner familiar to us from Bruno Latour's critique of dualistic assumptions of modernity (*Never Been Modern*).[111]

The treatment of representational ontologies also seems to be of particular relevance here because of the lingering 'promise' of the computational digital as a method for eliminating error and realising the truth (Coopmans et al.). The computational digital that pixelates the world into discrete units is the epitome of Enlightenment thinking that seeks to illuminate the subject in order to bring high-resolution order and predictability to reality. The representational reduction of the world to bits and bytes might then be seen as a calibration of Enlightenment reasoning in the face of the computational gaze – a particular gaze that prescribes a specific kind of logic. This is a logic that, in the context of Enlightenment thinking, philosopher Fanie de Beer describes as losing "sight of the fact that the process of forming or form-giving implies off-cuts and rejects" (3). Following a reading of Michel Foucault's subject as

an effect of power, such a position asserts that any form of knowledge – as a form-giving awareness-of – necessarily renders subjects as representations. While this reading problematically positions Foucault as a dualist caught up in inescapable subject-object power relations – a limited reading which we will return to later – it further highlights the limitations of defining the digital as a representation. Rather than supporting the empirical objectivity of the digital, then, representational ontologies call into question the discrete objectivity of the digital, and this necessitates abandoning the absolutes of objective rationalism that are revealed by non-dualist thinking.

De Beer develops this argument based largely on Michel Serres' work on order and disorder,[112] and calls for us to "leave oppositional strategies behind and to move into the dynamics of differential and complementary thinking – the ability to think presence and absence, light and darkness, truth and lie, life and death and so forth simultaneously" (4). Thus, both the digital and the representational are necessarily bracketed-out from Serres' 'differential and complementary thinking' in a way that calls into question the certitude of scientific objectivity.[113] In framing the terms *digital* and *representation* in this way, I place the construct of logic itself in parenthesis as being what Serres describes as a dialectic contradiction: "Dialectics recites a logic so impoverished that anything and everything can be drawn from it" (Serres and Latour, *Conversation on Science 155*).[114]
The implications of Latour's critique of scientific objectivity resonates here. In fact, Latour seems clearly indebted to both Serres for his quasi-object and to Foucault for the agency of his nature-culture collective that precedes subject/object divisions.[115] The resulting crisis of critique that this reading supports, promotes a non-dualist response.[116] I argue that such conflicts, which Latour says separate knowledge and power, nature and culture (*Never Been Modern* 3), and Serres claims pit reason against unreason, are applicable to the dualisms of the digital/analog, subject/object discussed here. However, these oppositional ontologies

need to find resolution here in non-dualist forms of *representation* that function not as a substitute-for an object, but rather as a go-between-object in itself – in representation as a verb that must be practised, rather than as a noun that holds the place of another thing.

Serres' challenge to the unquestionable certainty of logic is echoed by art theorist Jan Verwoert's *logical* argument against the imperatives of high-performance culture to 'get it' (*94 & 95)*.[117] The inescapable irony of this – that cannot have escaped Verwoert – is one of the methodological challenges for this thesis, one that Serres appears to address through the use of metaphor. In this regard, Serres' conception of the go-between serves a dual function. As well as extending the emergent definition of the digital, it embeds that definition within a particular methodological perspective – an embeddedness that finds parallel in the way that Serres himself functions as a go-between between content and method. The question of methodology will, however, need to wait until we have a clearer understanding of the terms by which the practice of representing might function as a non-dualist form of differentiation.[118]

In Serres' work, metaphor acts as a representational go-between that serves the function of going "where neither mathematics nor logic can go" (*Conversation on Science* 72). Although resulting in intricate comparisons of sometimes obscure subjects,[119] Serres' tactic of using metaphor as a means of traversing dualisms asks us to "suspend all judgment" and, like Verwoert, offers only indeterminate struggle as a critical context (*Conversation on Science* 53). Serres' use of metaphor, then, helps redefine representation by articulating episteme as an emergent and dynamic process.[120] Indeed, as Christopher Watkins notes, Serres' early influence on the work of Latour and his conception of the parasite in post-human terms,[121] made an important contribution to non-correlational, non-dualist philosophies (5-6), a contribution which I suggest is even more explicitly connected to New Materialist thinking

that is introduced in Appendix 10, through Serres' construction of the quasi-object.[122]

Serres' method also provides a way of reconciling the constraints of disciplinary domains of knowledge through the use of a meta-language that bridges epistemic models of the *physical* and the *mathematical* (*Conversation on Science* 63-64). Indeed, Serres makes the connection between mathematics and metaphor explicit when – in explication of the Greek god Hermes[123] – he asserts that "*metaphor,* in fact, means 'transport.' That's Hermes' very method: he exports and imports" (*Conversation on Science* 66). Not unlike Serres, I am arguing for the agency of a *transport* that traverses the space between things as an object of knowledge in-itself, rather than as a something demarked by the interval between points of knowledge. Like the metaphor of the ball that Latour suggests to Serres, Hermes is a quasi-object – a true subject of agency that the players position themselves in relation to (*Conversation on Science* 108). Developing this metaphor of the ball[124] further, Serres explains the quasi-object as not being an object, but being "one nevertheless since it is not a subject, since it is in the world; it is also a quasi-subject, since it marks or designates a subject who, without it, would not be a subject" (*The Parasite* 225). Serres' ball seems like a *hot-potato* that literally bounces from subject to subject without becoming an object. Yet, as an object, the ball pushes the player-subject around the court, field or perhaps the art gallery. There seems to be neither subject nor object, merely the agency of play as an object in-itself. The players wait – not in lack-of something; rather in anticipation-of that which they are already a part of. In their waiting for the bounce-back of the ball, they never cease to be part of what they are as a player. Both ball and player practise each other as quasi-objects.

Extending the metaphor of the ball further myself,[125] the digital-as-representation – as an ontology of mutually exclusive descriptors – makes the paradox of dualism apparent: any game that might be played with

such a paradoxical ball – a representational ball that is a subject that denies itself – would clearly be a frustrating game of mutual exclusion. The ball cannot be treated as discrete by virtue of its being a representation, and inversely cannot be treated as a representational substitute as it is discretely present.[126] Thus the notion of the ball as a digital representation is a mutually exclusive relativist paradox.[127] In games played with such balls, neither the players nor the ball, as discrete subjects, have agency, unless we accept the notion of the quasi-object; a *go-between* that neither represents nor is represented by. While the digital as a thing-in-itself might be argued for as differentiated, it cannot also be a representation in the sense of something substituting for another thing. This would necessitate deference to an object other than itself – a function that would then negate its digital nature. Such an ontology requires not just developing a way of thinking about the digital as a quasi-object, as suggested by Serres, but also developing a way of playing or rather practising, without negating the digital itself as a discrete entity.

This ontological flip is a reaction to the dualist paradoxes that we have encountered previously, with regard to the Russell Paradox, monads and levels of abstraction. In placing the construct of objective logic itself in doubt, the reason for Latour appropriating Serres' notion of the quasi-object with regard to the social becomes clear.[128] Indeed, as Levi Bryant explains, the quasi-object is at the core of Latour's thesis that "society must be *built*. That it does not *explain*, but is that which must be *explained*" ("Of Quasi-Objects"). Although Bryant is presenting an argument to position Latour as a non-correlationist who is ambivalent in his humanist/antihumanist stance,[129] he also points to the non-legitimising function of the quasi-object that removes the burden of proof from human subjectivity and relocates it in the 'illegitimate' emergent entanglements of practice.

8.6 **Discrete-observations**

Although Latour's unpacking of Serres' quasi-object clearly merits further discussion with regard to understanding the explicit dynamics at play or in practice within Latour's discourses of knowledge,[130] I am firstly going to follow Latour's train of thought regarding the quasi-object and the legitimacy of criticism. "The Crisis of the Critical Stance" is a crisis – if that's actually what it is – of the discrete ontology of objects: the 'crisis' of the digital (Latour, *Never Been Modern* 5).

Framing the Nature-Culture divide as the crisis of modernity, Latour proposes an asymmetry of the practices of translation and purification that proliferate the critical project (*Never Been Modern* 10-11). The dualism Latour critiques is not only an anthropocentric dualism manifest in the work of 'purification', but also a dualism between network and object, between 'purification' and 'translation'.

There are two key points to be made here with regard to my argument – the first being that this oppositional framework establishes a problem against which Latour subsequently positions Serres' quasi-object, a point leading to the second; that "criticism itself has to face a crisis", and that "scientific facts are indeed constructed" (*Never Been Modern 51 and* 6). In this sense we must treat scientific facts as representations, made by a knowing subject, that within Latour's reading of modernism, are in conflict with the object being represented. Thus Latour effectively problematises the discreteness of 'fact' as a standalone 'truth' by aligning it with representation, and reinforces the paradox of D. Lewis' digital representation.

The empiricism of fact that resides in the discreteness of the digital is thus itself thrown into doubt. But further to this, the legitimacy of the method of defining discrete quantifiable fact – critique – is epistemologically challenged. We can never 'know for a fact' without falling into the

paradox of critique – without, as Latour says, "bringing the sword of criticism to criticism itself" ("Why Has Critique" 227). Thus we have a further and more complex problem with regard to digital representation – a problem that pulls the rug out from under the feet of digital differentiation more surely than critique itself can. Not only are these two terms mutually exclusive, but representation is left without a subject. Without a differentiated objective fact to represent, what does it mean to be a representation? Without criticality to validate objectivity, what distinguishes object from subject and, rather ironically, where does this leave Latour's critique of scientific certainty as social construct?

That nothing guarantees criticism to be right all the time, that "there is no such thing as natural, unmediated, unbiased access to truth, that we are always prisoners of language, that we always speak from a particular standpoint", creates a methodological paradox that questions the legitimacy of claims to knowledge that are a prerequisite for a PhD thesis (Latour, "Why Has Critique" 227). To legitimise my argument, then, I must unreasonably draw on methods that doubt their own legitimacy. Even in explaining this, though, I seem to risk undoing the very thing I am attempting to do.[131]

The crisis of criticism is, I suggest, an onto-representational crisis because criticism founded on objectivity is an epistemic dilemma rather than an ontological one. Indeed, being concerned primarily with the construction of knowledge rather than truth, Latour as an epistemic relativist would seem to support this view of criticism and necessarily reject ontological relativism.[132] It appears then that the "critical spirit" presented here by the ontological crisis of the discrete digital object, is the wrong approach (Latour, "Why Has Critique" 231). But what does Latour suggest instead? Should we reject criticality, and if so, in favour of what? Does it mean we should refute all and any claims to differentiation and wallow in a malaise of analog [continuous] uncertainty, rejecting matters of fact inherited from the Copernican

revolution? Are we to forget that the separation of episteme from ontology, subject from object, digital from analog are in fact dualisms premised in an anthropocentric worldview? Or can we, as Latour eventually proposes, change our understanding of what things are, of what objects are, and revise our understanding of subject-object relations and onto-epistemic claims to reality in pursuit of a clearer understanding of quasi-objects ("Why Has Critique" 231)?

8.6.1 **Quasi-observations**

When we begin to question anthropocentric primacy – as both Serres and Latour do indirectly through the quasi-object – onto-epistemic distinctions become blurred. The quasi-object refutes the paradoxical dualism of digital representation in two ways: it firstly represents without substituting; and secondly, through practice, it draws the objective criticality of the digital closer to knowing subjects. Distinctions between subjects and objects are still maintained and essential, but at the same time the inclusive agency of quasi-objects dissolves the oppositional tendencies necessary for criticality.

That Latour's explanation of the quasi-object is clearer than Serres' seems partly due to the distinction he makes between knowledge and truth – knowledge being concerned with objectivity, in contrast to truth which is taken as inherently subjective ("Bruno Latour: The Relativist"). Rather, truth according to Latour is a *kind* of objectivity – a 'subjective knowing' he describes as an event – that is epistemically relativist and anthropocentric ("A Textbook Case" 94).[133] Knowledge, on the other hand, "is an operation that produces objectivity through the practice of collective inquiry…" and is not necessarily dependent on epistemic knowledge ("Bruno Latour: The Relativist"). This distinction, I believe, can be clearly identified in Latour's Nature-Culture divide, onto which correlationalists would undoubtedly map truth and knowledge.

It is this asymmetrical distinction between truth and knowledge[134] that leads Latour to denounce criticism and objectivity, turning instead to the go-between agency of the quasi-object (*Never Been Modern* 51-55). However, I will leave aside the details of his deconstruction of asymmetry here in order to focus on the quasi-object itself, which he positions between these "two poles, at the very place around which dualism and dialectics had endlessly turned without being able to come to grips with them" (*Never Been Modern* 55).[135]

But for Latour, the quasi-object is more than simply the space between two dialectical positions. The quasi-object is inextricably embedded in a complex network of things as a hybrid translation: a symmetrical network that ultimately resolves oppositional dualism. Rejecting Phenomenological solutions to reconciling the tensions between subject and object, the quasi-object is dynamically embedded between two things (*Never Been Modern* 58). As the distinction between these things increases, quasi-objects multiply, forcing opposing objects to move further apart in a compounding cycle. Symmetry is achieved by shifting focus from objects to quasi-objects. Although frustratingly enigmatic in its seemingly self-defeatist paradox, the difficulty with Latour's symmetrical model is not so much that it is a nonsense, but that it questions the illegitimacy of nonsense by calling into question the authenticity of criticality. Thus critically disarmed, we are left not knowing how to respond without revising our whole understanding of subject-object relations.[136]

We can see here how Latour's quasi-object is very similar to Serres' description of it as a ball in a soccer game. The agency of the game belongs to the network of the game, rather than with the ball or the players as discrete entities. It's all about the game, and the identity of the ball or the player is hardly significant. Although it is clearly erroneous to directly compare Latour's principle of symmetry to the analogy of

raisin-bread dough as a model of the expanding universe theory [137] – in that the dough clearly has agency in pushing the raisins further apart from each other – the comparison does inform the question of objectivity with regard to non-correlational thinking, and ultimately addresses the relationship between discrete entities and the continuity within which they exist.[138]

In the raisin bread universe model, as the dough expands the raisins become further and further apart, regardless of where they are in relation to the dough. The key point of this model as it relates to my argument, is that it does not privilege any one single raisin. Each raisin moves apart from every other raisin and no raisin can claim to be at the centre (Wolfson). No object is a subject for another, but through the agency of the dough. As Latour says, explanation starts with the agency of the quasi-object – the dough – that is itself defined by what it is explaining (*Never Been Modern* 95). It is, then, this generalised principle of symmetry that leads Latour to take-up Serres' quasi-object and to formulate his *parliament of things.*

8.6.2 **Intersubjective-observations**

In Latour's *parliament of things,* representation serves as the arbiter of difference. It is, however, a gathering of *things* that represents as a verb in practice, rather than as an object of substance. Referring to Martin Heidegger to explain this in terms of *das ting*— the unified fourfold of earth, sky, divinity and mortals[139] – Latour redefines objects as multifold *gatherings* of an agency of *things* ("Critique" 233). Objects, then, are no longer immutable subjects patiently awaiting human intentionality, but *things* that "have to be gathered first in order to exist later as what stands apart" (Latour, "Critique" 236). Deriving his *parliament of things* from the etymology of *thing* as a *gathering,*[140] Latour again takes us back to the paradoxical distinction between the objectivity of knowledge and the

subjectivity of truth. These paradoxes, I suggest, are also inherent in the notion of digital representation, such that "matters of fact are not all that is given to experience" (Latour "Critique" 231-32). We should instead, Latour says, look to 'matters of concern' to resolve the paradox of criticism and, by extension, subjectivist and digital representation.

In distinguishing between *matters of fact* and *matters of concern*, Latour compels us to move towards the *Thing,* not away from it; towards the agency of the quasi-object, towards that which assembles before it has a subject ("Critique" 246).[141] It is here in the agency of practice that criticism resides, not in the objective knowledge of the critically differentiated. The contradiction inherent in Lewis' definition of digital representation is shown to be a necessary contradiction in which the coupling becomes a *Thing:* an assembly in which 'stuff' must happen before objects can be. It is a gathering in which matters of common concern bring together concerned matter – a practice of knowledge that is collectively constituted by inter-subjective relations.[142]

Rather than being an inevitable consequence of representational dualism that results from the subjective gaze, is knowledge, then, simply a necessary consequence of practice? Is it possible that an object has knowledge in and of itself, in-itself alone? Surely, if an object has knowledge per se, this is gained only through its interaction with other objects? In which case, knowledge preceded objects – things are known to objects only because they have already been practised. Yet without objects there is nothing to partake in practice.[143] Again, from a dualist position, we are confronted with a seemingly unresolvable methodological paradox that seems to validate representational ontologies of the mind. As this has been shown as equally problematic in order to resolve the recursive conundrum of digital representation, we need to push beyond dualisms and consider the agencies of *intentionality* such as that developed in the phenomenology of Edmund Husserl.

Intention for Husserl is not an anthropocentric subjective act of purpose, but rather a "fundamental property of consciousness" (*Cartesian Meditations* 33).[144] Following Husserl's transcendental phenomenology,[145] it can be said that 'I intend an object', signalling simply that a knowing subject has turned its attention to an object. While problematic due to its entrenched anthropocentrism, Husserl's work is useful in that an *intentional act (*noesis) is inextricably partnered with an *intentional object* (noemata) to define *intentional content*— the object as it is perceived by the subject. An object is not normally 'known' to a subject except through the *intentional content*.[146] Or, as Philip Jones puts it, "besides the things that are known there is always the thing that knows them" (49). Thus 'bracketed out', the object exists in the subject as intersubjective content that transcends purely subjective knowledge – knowledge that is the proprietary knowledge of the subject. What we know of the world is not simply ours alone anymore, but is a result of a subject intending an object.[147]

It is important, then, to understand intersubjectivity in general as more than simply the shared interceders of two objects in a venn diagram. In such a case, subject/object distinctions are maintained, with the object at best being represented by the subject in some way. Instead, following Husserl, intersubjectivity should be taken as pertaining to a "relationship between me and the other *where the other is not alien to me*" (Ferrarello, my emphasis). In this more refined model, the way in which Husserl's *intentionality* compounds subject and object indicates a phenomenological ground from which we can begin to transcend Cartesian limitations, and to move beyond the constraints of subjective solipsism and dualist paradoxes.[148]

An important feature of Husserl's model is that intersubjectivity is both distinct from and part of both subject and object. The subject only perceives the object as intentional content that the subject is always

meta to. This is significantly different from the venn diagram illustration of intersubjectivity, in which subjects directly intersect with objects. Intersubjectivity, according to Husserl, is a third position that allows for objectivity. Intersubjectivity, then, is not simply the relationship between things – the dualism that renders representation – but is the compounding of egos that "seem to live many lives at once" (Ferrarello).

Admittedly Husserl's argument at first seems to spiral out of ontological control, with objects and subjects always regressively compounding themselves on yet another meta-subjective level of awareness that must lie beyond any experienced object.[149] Intersubjectivity is ultimately reductive in this sense. Attempting to create some resolution to his seeming meta-subjective argument, Husserl states that "by virtue of the mentioned communalisation <of constitutive intentionality>, the transcendental intersubjectivity has an intersubjective sphere of its own, in which it constitutes the Objective world; and thus as the transcendencental 'We', it is subjectively for this world and also for the world of men, which is the form in which it has made itself Objectively actual" (*Cartesian Meditations* 107). While, through the density of his writing, Husserl 'ejects' the reader from the text and creates space for intersubjective content, it may not actually help make things that much clearer. Or, at least, the clarity it provides is intersubjective in nature, as opposed to explicit. The intersubjective implication is, however, that having transcended intentional content through reduction, the ego of the subject is no longer immanent in the Kantian sense – it is inextricably linked to the intersubjective of which it is both subject and object.

Following Husserlian phenomenology through a slightly different line of reasoning, Hui brings this to a different conclusion with regard to intersubjectivity.[150] Instead of understanding intersubjectivity as always being "related to knowledge inside the mind of the subject", Hui suggests that we should understand it in terms of "object-milieu correlations" (*Existence of Digital Objects* 154 & 158).[151] Arguing that a

milieu – an objects-associated 'environment'[152] – temporally transcends objectification, Hui proposes *interobjectivity* as a method of "materialization of both internal and external relations" (*Existence of Digital Objects* 160). But, again, Hui limits his argument, explaining that this is the method realised by 'digital objects' in the materialisation of "virtual relations determined by representations" (*Existence of Digital Objects* 161). The 'digital object' here is treated as a given of "technical milieu" and as such interobjectivity is understood in terms of orders of magnitude (Simondon, 64)[153]. Despite espousing commitment to relationality over objects, this technical determinacy leads Hui back to an ontology of representation by simply transposing technology and mind. Intersubjectivity or, as Hui rebrands it interobjectivity, is still conceived through the immanence of a subjective entity.

Hui then exemplifies a problem: although it is possible to argue that intersubjectivity transcends representation by collapsing subject and object dualisms into an inter-subject that neither stands in place of, nor speaks for, another object, the intersubjective object not only becomes an object in its own right, but is also entirely dependent on both the intending subject and the intentional object that constituted it. The limitation of Husserlian phenomenology with regard to this thesis is that intentionality is ultimately seen as "a 'being of' and 'about' something", and necessarily makes "representation the mainstay of any intentional objectifying act" (Ferrarello 4).[154] The position of the meta-subject thus inevitably reduces intersubjectivity to empathetic representation. Although in contrast to Husserl's own position that intersubjectivity transcends language and thus representation,[155] Ferrarello creates good reason to question Husserl's intersubjectivity as a solution to the conflicting duality of digital representation.

Indeed, it seems that as long as consciousness remains a prerequisite to intersubjective ontologies,[156] then the digital as inanimate matter lies outside the strict definitions of intersubjectivity. Although Husserl, through

empathy, does not exclude the potential of a "radical 'trans-species'" inter-subjectivity (Painter and Lotz, 4), the extension of Husserlian intersubjectivity to the inanimate seems a stretch – even more so if we consider Maurice Merleau-Ponty's embodied intersubjectivity (*Phenomenology of Perception*). Although as Merleau-Ponty "reaches out" to the world of objects, turning Husserl's *intentional acts* into *intentional arcs* – cognition and desire subtended in the action of the body – he simply embeds consciousness in the body of the subject *(Phenomenology of Perception 157)*. Intersubjectivity simply becomes the act of a conscious embodied subject, rather than the removal of the prerequisite of ego. Unlike Serres' ball that forces bodies to run around, the body in Merleau-Ponty's Phenomenology must always reach out across space to catch the ball that is given no agency. In the terms that *quasi-objects,* as defined by Serres, are a representation or metaphor,[157] they too prohibit objects of agency and deny the potential of a differentiated ontology.[158] Inanimate objects presumed to be lacking both agency and perceptual consciousness, are thus incapable of transcendental intersubjectivity or quasi-ontological status. Representation seems unavoidable, and digital representation – the act of speaking on behalf of a differentiated object without turning it into a subject - seems an impossibility. What then are things, if not subjects and objects, if they are no longer differentiated as representations?

8.7 **What things are**

What things are, or rather what digital things are taken as being, is that which is a *differentiated representation*. This has proved to be a problematic construct as it apparently concatenates two mutually exclusive concepts.[159] Rather curiously, what is emerging as digital is not a finite discrete entity – an individuated digit – but a 'gathering' of entities that emphasise the agency of becoming, as much as it does of the entities gathering.[160] Although the attention of this thesis now shifts towards understanding this agency, the entities themselves should not

be overlooked.[161] For this reason it is helpful to briefly discuss the nature of *simple substances* – the foundational element, in the context of Goodman and Leibniz – although, of course, the broader question of *substance* itself sits well beyond the scope of this thesis.[162]

To make the relevance of this clear, in philosophy *substances* are generally considered to be those individual entities having qualities that endure though time.[163] In other words, they are not composites or class-predicated elements that come together in time. Given this, it is appropriate to return to Goodman, as for him it is only *such substances* that we can fully differentiate between, as composite substances represent gatherings of more than one entity.[164] While it is important to remember that even where individuated entities, such as the digital, are bound together in the mutual determinacy of semantic content and syntax, the problem of how to practicably resolve this feed-back loop will not be addressed until Appendix 10. For now the question is simply to determine what *qualities* define a *substance*.[165]

8.7.1 **Substance**

To problematise the concept of *substance,* it is helpful to look again at Evens' articulation of the bit as fundamental digital substance, because Evens appears to shift ontological positions – speaking to the differences between Goodman and Leibniz as he does. This shift is evident in his conception of the bit as an entity "drained of substance"(*Logic of the Digital* 8).[166] For such a proposition to hold, it requires *substance* to operate in two ways – as both an entity and no-entity entity.[167] The way Evens suggests the digital does this is by divorcing itself from its own materiality by carrying its space and time discretely within itself while still inhabiting human space and time (*Logic of the Digital* 130).[168] Although Evens again makes the mistake of compounding the computational and the digital by attribution of this temporal flexibility to the command flows

of the CPU and interface, he points to a key question regarding *substance* with regard to the location of temporality. It is this question of temporal location that distinguishes Leibniz's treatment of substance from Goodman's.

We have already seen at the beginning of this appendix how, for Leibniz, the monad is a basic self-actualising *substance* that contains all possibilities, not just the particular possibilities of a given form.[169] Implicit here is the idea that *substance* cannot be reduced to static form that is defined in a purely atomic sense. Monadic *substances* are subject to change, which is to say that they themselves are different in different times and different places. The basis of this distinction is metaphysical, in that atomism is concerned purely with the nature of substance, while monads are committed to a higher order metaphysical essence.[170] Although *The Monadology* makes only passing comment on this, Leibniz in his letters to Arnold discusses this distinction at length, and is insistent on the divine foundation of genuine substances and explicitly dismissive of atomists reasoning on this basis[171] ("Correspondence Between" 55-63). The argument is that as divine *substances* – subjects containing their predicate – monads must internalise all possible potentials *including* both space and time. In this, Leibniz is vehemently opposed to his contemporaries Isaac Newton and Samuel Clarke, whose absolute treatment of space and time is the basis of the *principle of the identity of indiscernibles,* that itself stems from the *principle of sufficient reason.*[172] Following this basic principle of logic, objects that are indiscernible are necessarily identical.[173]

Leibniz's position is, then, that monads represent more completely differentiated entities than atoms in that, by virtue of internalising every possibility from the moment of their inception, they are *truly* indivisible non-composite entities defined by the *active force* which each monad possesses internally.[174] While atoms on the other hand are "capable of expansion and can be regarded as separable,[…] monads cannot [be]

because they are metaphysical conditions" (Diodato 164). In this sense, programming objects, rather than being like monads as Kays suggests, are like atoms. Given that OOP's teleological commitment is driven by master-slave inheritance of classes and instances, the very notion of a discrete OOP object is confounded at a metaphysical level. Even if we were to take computer hardware or programmers as cause for *sufficient-reason,* and attribute creative inspection to them, the design concept of instances and classes was never such that it was intended to have internalised monadic autonomy. In fact, the Idea-Idea of the OOP object as explained by Kay was always human-centric,[175] as epitomised by the metaphorical use of 'object' to describe aspects of code. In this sense, the conception of the computational-digital as monadically discrete was set up to be thwarted at the outset by its own correlational impetus.

Whereas monads internalise space and time, in Goodman's conception of *simple substances,* time needs to be constructed. Goodman's argument about how this happens is derived from Rudolf Carnap, who describes the "basic elements" or *elementarerlebnisse* of his constitutional system known as *Aufbau*.[176] As we are only concerned with Goodman's construct of the individuality of substance here, the discussion will be focused on his interpretation of the *erleb – or* time-slice experiences,[177] although, as Cohnitz and Rossberg point out, Carnap's influence is significant (99-114).[178]

The difficulty in understanding what constitutes Goodman's elemental substance is that it is even harder to define than a monad. It is a construct of experience, concrete entities and quail – the predicate experiences prescribed by the system or syntax that perceives it: we can't exactly say that quail are the base atomic unit as they don't properly exist until concrete entities are experienced. Neither can we say that experience is the fundamental element, as it is "subjectless" until the predicate system identifies particular quail of the concrete entities it perceives[179] (*Structure of Appearance* 112). Perhaps we could even say

that quail, like quasi-objects, exist in the trajectory of a ball as it moves players around it? That connection notwithstanding, while it might be rather "pointless to ask which unit comes first", it is convenient to think of quail as being the property of concrete entities as experienced within a given system (Goodman, *Structure of Appearance* 138). However, it is really the 'overlap' deriving from this temporal-spatial experience of quail, concrete entity and experience that constitute Goodman's simple substance.[180] It is also important to stress the significance of the system that this temporal-spatial experience operates in, as this leads to the construction of different representations or *world-versions,* as already discussed.[181] What emerges from it at any given moment is predicated by the perceptual syntax governing experience. Thus we can see why the issues of predicate syntax and *world-version* were important to lay out in some detail earlier.[182] In this sense, we might say that Goodman's *simple substance* is also substanceless, or perhaps it is more useful to say that it is spatio-temporal. In this respect, Goodman's erleb is perhaps not unlike Evens' bit: it is substance drained of substance that is both entity and non-entity entity, a subject and object to itself as much as to other things.

The point of this analysis is, however, not to decide if it is Goodman, Leibniz or, for that matter, Evens, who presents the most viable definition of *substance,* but to assert that substance is not a purely concrete proposition.[183] As such, I want to argue that it is the time-slices of experience conceived of as spatio-temporal events that are *differentiated* entities. As subjects containing their own predicate, Leibniz's monads realise this by internalising both space and time.[184] However, as argued earlier, while they are internally self-sufficient they require a transcendent agent or 'sufficient reason' in order for them to be dynamic. Perhaps in this sense they might be seen as less complete. In contrast, erlebs are declaratively subjectless non-entities entities, comprised of overlapping spatio-temporal elements that self define. It is not so much that they internalise time, but that they are *in* time. By being

in time they differentiate themselves as individuated substances that project into the world as they constitute themselves.[185] Regardless of whether time is externalised as with monads, or internalised as with erlebs, a substance that can be *differentiated* is necessarily temporal. Thus, substance becomes *differentiated* as a quasi-onto-epistemic entity that refutes subject-object dualisms.

8.7.2 **Time**

Although we can think of substance as temporal in a variety of ways, further consideration is needed to determine how quasi-, inter- and intra-subjective propositions such as erlebs and monads can inform the treatment of differentiation we are working towards. While the construct of erlebs explained in the previous section brings together many of the concepts that were set out in Appendices 8.3 and 8.5, it inevitably poses further questions. These will be the focus of Section 10. What should now be evident is why the erleb's time-slice construct is so central to Goodman's argument. Substantiating time as it does, the erleb overcomes the problems of infinity that otherwise necessitate the construction of abstract entities. Abstract entities such as classes presuppose an infinite universe as a way of postponing unresolvable paradoxes: you can only go on propagating classes of classes to contain themselves if the universe is infinite. But, as Goodman points out, the universe as we know it "consists of a finite number of spatio-temporally scattered quanta of action" ("Steps Toward a Constructive Nominalism" 106). Although not set out in exactly these terms, Goodman and Quine argue for this in "Steps Towards a Constructive Nominalism", where they also make clear the reasons for their rejection of platonism:

> We decline to assume that there are infinitely many objects. Not only is our own experience finite, but there is no agreement among physicists that there are more than finitely many physical objects in all space-time. If in fact the concrete world is finite,

> acceptance of any theory that presupposes infinity would require us to assume that in addition to the concrete objects, finite in number, there are also abstract entities. ("Steps Toward a Constructive Nominalism" 106)

And later in the same text:

> We use 'platonistic' as the antithesis of 'nominalistic'. Thus any language or theory that involves commitment to any abstract entity is platonistic. ("Steps Toward a Constructive Nominalism" 111)

Thus, in opposition to nominalism, the infinite is conceived of as a platonistic syntax that is inconsistent with our experience of the world.[186] The concept of the infinite, as the abstract set of all sets that are not members of themselves, is thus both the solution to and the paradox of self-referential recursion: the paradox of classes is indefinitely postponed by an infinite recursion of classes. The infinite is such that its continuity resists individual differentiation.[187]

It is also worth pointing out here, in case the association has not been made, that the Russell Paradox bears similarity to the Undecidability Problem.[188] Although it is not possible to give a full account of this here, the Undecidability Problem seeks to resolve if there is a general method for determining whether something is true or not within a finite period of time.[189] What Alan Turing showed with his 'computing machine', is that there is no general solution to this question; for a method that uses its own output as input or, in other words, an entity that contains itself, no answer is assured ("Computable Numbers"). Of course, this is a gross simplification, but it is sufficient to make it clear that the Russell Paradox and Undecidability Problem raise similar questions about the possibility of determinacy and the consequences of infinite recursion: if it does, then it doesn't, and yet if it doesn't, then it does.[190] Given the Russell Paradox,

how are we to define individuals; and, given the Undecidability Problem, how can we be assured of a definitive answer to the question of whether something is an individual or not? With regard to both of these problems, the 'computing machine' simply shows that when a subject uses itself as subject, it ends up in an indeterminate recursive loop of infinitely reoccurring classes of classes that never formulate a definitive entity. Inserting the question of the differentiation of individuals into Turing-like proposition then, we might get something like: is 'I' an individual given itself as an input? The outcome using a 'computing machine' would be inconclusive – stuck in a feedback loop, we would never get an answer. The best we might hope for is to define another class.

Of course, having invoked Turing in passing it is necessary to acknowledge the significance of his contribution to computing, although this is by no means central to my thesis.[191] Indeed, his conception of 1s and 0s semantic binary content, and the ordering of them within a syntactical structure anticipates many core digital computing concepts. But, as argued, taking the Turing machine as a solution to the individuation of substance relies on syntactical methods to render finite the infinitely real numbers: memory or tape length must be potentially infinite for a finite proposition to be resolved. Thus, the syntax operates as a method for defining a class. Turing acknowledges this by defining *computable numbers* as a class of numbers: "I show that certain large classes of numbers are computable. […] Although the class of computable numbers is so great, and in many ways similar to the class of real numbers, it is never-the-less enumerable"("Computable Numbers" 230).[192] This is not to contest the significance of Turing machines, but simply to point out that their method of resolving decidability involves employing a finite class of infinite entities. This is because if we want to determine an entity that can be individuated, that can be differentiated from other entities, it must be finite. But what does that mean in temporal terms?

Of direct concern here is whether the erleb's internalised temporal condition presents a solution to the Undecidability Problem for individuation without resulting in infinite class paradoxes. If an entity is a true individual – one that can be differentiated from other entities – then it, too, must be finite. As already established, the erleb becomes a *substantive* entity through its temporality that is *in* the world. This is not intended to mean that time is external to it, like a box containing it, but neither does it mean that it functions like a box itself and contains time. The erleb is *in* time because time becomes *in* its experience of the quail of concrete entities. As a *substance,* it denies the function of infinitely recursive classes as a solution to differentiation, and defines itself as a finite entity by its method of being *in* the world. Its *substantive* method of being is to be *in* time.

But being *in* time is not such a simple matter. It is not a matter of being in time for something, but being *something* in time as itself: Time is plagued by the question of when. Rather than looking for a solution here, I want to clarify the problem by referring to the infinite "tape" in one of Turing's 'computing machines':

> The machine is supplied with a "tape" (the analogue of paper) running through it, and divided into sections (called "squares") each capable of bearing a "symbol". At any moment there is just one square, say the r-th, bearing the symbol <2>(r) which is "in the machine". We may call this square the "scanned square ". The symbol on the scanned square may be called the " scanned symbol". The "scanned symbol" is the only one of which the machine is, so to speak, "directly aware". […] The machine may also change the square which is being scanned, but only by shifting it one place to right or left. ("Computable Numbers" 231)

The tape here appears a little like an infinite film strip: a progression of frames that can be 'scanned' one at a time. The square that is 'in the

machine' is in the present. It holds an image [symbol] selected from an undetermined number of images. But unlike the film that runs in one direction from beginning to end[193], the 'computing machine' can move in both directions up and down the tape. Having moved to the right a few times, now suppose that the machine decides to move to the left.[194] In comparison to a film in which time would typically appear to run backward into the past, there is no suggestion of this in the computing machine. Although it moves from square to square much like a film, the computing machine treats the content of each square in isolation, and sees the set of all squares though the filter of an algorithm.[195] Just as 'space' is defined by the number of squares used, it is the algorithm, or rather the complexity of the algorithm, that determines time in the 'computing machine'.[196] As we all know from our use of personal computers, 'computer time' and human time are not intrinsically linked.[197]

My point here is to illustrate the constraints of linear conceptions of time, which might, like Zeno's arrow,[198] aim to divide the computing tape into infinitely small segments without ever reaching the end. By comparison, the erleb is more like the syntax of the algorithm that internalises time – or makes it conditional upon the spatial relationship of the semantic content. Conceived of as such, the spatio-temporality of an 'erleb machine' might be conceived of an algorithm, one in which experience equates to 'time complexity',[199] concrete entities to 'space complexity'[200] and quail to semantic content.[201]

Although the comparison with Zeno's arrow, and the equation of the algorithmic with experienced time, might bring to mind Henri Bergson's conception of "duration", we should not think of erlebs as being completely the same as 'duration'. They do, however, share a common disposition towards the qualitative. Experienced time, as Bergson argues, is not like Zeno's arrow that insists on breaking time down like points of semantic content inscribed within a square: the time of line A-B is not

defined by the points A and B but by the duration of the vector itself – the hyphen as the duration of experience (*Creative Mind* 117-120).[202] Stemming from Bergson's rejection of science's inability to "deal with time and motion except on condition of first eliminating the essential and the qualitative …", 'duration' as substance is time that dissolves like a sugar lump (Bergson, *Creative Mind* 115; *Creative Evolution* 9-10). Paralleling this mutual infusion, the nature of space and time that is found in the spatio-temporal construct of the erleb, Bergson suggests that time should not to be a measure of reconstituted movements of the immobile. Rather, he suggests, it is an "indivisible continuity of change" of "what no longer exists into what does exist": "real duration is what we have always called time" (*Creative Mind* 124; *Duration and Simultaneity* 49). Defeating the intransigence of immobility, Bergson moves us towards the understanding that change is not a condition of time. Time in which nothing appears to be happening – time we might typically think of as time spent 'waiting' – is not without time.[203] Rather, I suggest, it is a *complex time* or, more specifically, a 'time complexity' conceived of here as an erleb algorithm. Time with regard to 'duration' is no more conditional upon change than the 'computing machine'. Like the erleb, duration's time is determined though an internalised being *in* time. Time is thus not conceived of as being made up of discrete units of quantity, but as "a continuous and *qualitative* multiplicity with no resemblance to number" (Bergson, *Time and Free Will* 105, my emphasis).

8.8 **Being**

The erleb has been interpreted as a non-dualist becoming that is manifest in the algorithm of its being *in* time. Arising from the need to transcend representational subject/object dualisms to identify what it is that can be *differentiated*, the erleb as a spatio-temporal entity is conceived of as being without 'duration'– presented thus far as being *in* time. But even a *substance* conceived of in this way seems unable to

escape the recursive contradictions of self-reference because as a predicate construct 'being in time' restores class paradoxes that have been rejected in terms of individuation. If being is already temporal then what would it mean for being to be *in* time? Doesn't being simply become a subset of time? Quite possibly at this point we have simply reached the limits of language. However, to test that and look beyond this possibility it seems necessary to confront the subjective status of being itself, rather than the being of the thing *in*-itself.

In this sense, perhaps, as suggested by Graham Harman,[204] we need go no further than the title of Heidegger's *Being and Time* to resolve this question because, as Harman reminds us, Heidegger essentially had one idea throughout his entire career:

> For Heidegger that single thought can be expressed as follows: being is not presence. Being is not present, because being is time - and time is something never simply present, but constantly torn apart… (*Heidegger Explained* 1)

While of course the simplicity of this statement is inadequate to explain the reasoning behind Heidegger's thesis, it does provide a concise framework for understanding Heidegger's conception of *being* as Dasein[205] – a specific Heideggerian type of *Being*.[206] No doubt the irony of discussing the *thing* that is Dasein would not have been lost on Heidegger in light of the circular paradoxes being addressed. In fact, the singularity of Heidegger's purpose exemplifies the point: can we really isolate one of Heidegger's terms from his greater thesis, or do we need to allow mere things to gather the properties that they in themselves are (Berkowitz 7)?

Harman, then, no doubt overly simplifies Heidegger's entire thesis as being an assertion that "*being is not presence", because "being is time* – and time is something never simply present" *(Heidegger Explained* 1*)*.

Perhaps frustratingly, we again seem caught in some circular argument that means *Being* never is. But this is the key point we need to take here: that the problems of subject/object distinctions, the problems of intersubjective transcendental phenomenology, the problem of erleb's being, the problems of differentiation and representation, indeed the problems of the digital, are only problems if we are blind to the onto-epistemic agency of the event – that which according to Heidegger is the very character of things. Rather than problematising the circular argument of differentiated representation, then, the *event* proposes to resolve it. It is through his construct of the thing as *event*, rather than as perceptual or physical occurrence, that things are. Things under Heidegger become a 'how', not a 'what' which cannot be reduced to a set of linguistic traits. "What things really are is events" (Harman, *Heidegger Explained* 24).

In order to understand how Heidegger can make this claim we first need to clarify exactly what he means by Dasein.[207] For Heidegger Dasein has specific meaning beyond its everyday use in German as meaning '"being-there" or, as Heidegger says, Dasein is the "entity which each of us is himself and which includes inquiring as one of the possibilities of Being" (Harman, *Heidegger Explained* 25; Heidegger, *Being and Time* 28). To *be-there* is to be aware of the impossibility of being-*there*. It is important to understand that Dasein is specifically and exclusively "the kind of Being that belongs to *persons*" that are things in themselves (Heidegger *Being and Time* 28). In a recursion reminiscent of Husserl's *intentional act,* Dasein folds in on itself as a performance of its own being. I will return to the problem of Dasein in regards to anthropocentrism later,[208] but for now it is enough to note that once again we seem to confront the circularity of a thing undertaking itself – a circularity in which to understand the *being* of a thing we must first understand *Being* a thing ourselves. Despite never taking *Being* ontologically, Heidegger declares there is no ontological knowledge without Dasein (*Being and Time 27 & 42)*. Thus because human being

always preceded ontology, ontology remains vested in phenomenology.[209]

From this position, then, the epistemic priority that *Being* maintains over ontology – over digital ontology – again problematises the notion of differentiation, as the ontologically discrete would need to be epistemically withdrawn to maintain any quality of being digital. It seems that in accepting the phenomenological priority of *Being,* the notion of the digital as a differentiated individual is further problematised. A thing that is discrete must be outside knowledge *if* we assume *Being* to be continuous, in which case we cannot know that which is discrete.

As a way of resolving this seemingly inescapable recursion between ontology and epistemology, it would seem easy to quote perhaps over-used Heideggarian concepts regarding the hammer being *present* and *ready-at-hand*.[210] Indeed, this is the approach Hui takes as he attempts to phenomenologically locate digital objects in the primacy of *Dasein's* 'concern' for 'relations' (113-118).[211] While the thrust of Hui's argument in this regard is compatible with the immediate position taken in this thesis, the deterministic nature of Hui's analysis predictably leads him back to levels-of-abstraction arguments that conform with his computational preconceptions of the digital (120). Given that Hui's conclusion on relationality is consistent with the position taken here, we can for now set aside further discussion of hammers and handleability and look instead to the solution offered by Heidegger in his preceding analysis of phenomenology (*Being and Time* 29-32). Here presenting phenomenology as a "methodological conception", Heidegger points us to the *how* of research, rather than the *what* (*Being and Time* 28). It is this *how* – the how of the *event* as presented by Heidegger – that in part resolves the circular paradox of differentiated representation, a resolve that also points to the significance of practice as a function of knowledge production within this thesis.

Consideration of how practice operates with regard to methodology is central to the discussion of practice in Appendix 9. Here, then, the discussion of *Being* performs the double role of clarifying the question and locating that question within the methodological approach. The circularity of this construct in which the subject becomes its own subject is not incidental here, as the method taken as *being* provides its own resolution – a resolution that differentiates itself in the method of practising itself.

Similarly, while Harman's 'Object Oriented Ontology' does not assume the same significance here as Heidegger's *Being,* his reading of Heidegger is useful because – as well as succinctly encapsulating core concepts – his ontology speaks to the difficulties of correlationalism that seem inherent in *Dasein*. In doing this, Harman opens the door to new speculative ontologies that appear in Appendix 10. That said, while Harman's '*being is time'* summary of Heidegger's idea presents a manageable *enframing*[212] of *Dasein,* it rather overlooks a significant shift that occurs in Heidegger's understanding of *Being* in *Contributions to Philosophy (of the Event)*.[213] It is in *Contributions to Philosophy* that Heidegger refines the notion of *Being,*[214] and starts using *Beyng* to indicate a shift in his conception of *Dasein* as a *Being which* "appropriates thinking to itself" and emphasises his rejection of phenomenological and metaphysical subject-object dichotomies (Ebert). It is here, then, in *Beyng* as *Event* – as Da-sein – that Heidegger's work informs the onto-epistemic problem of differentiated representation. As footnoted in Macquarrie's translation of *Being and Time*, Heidegger begins hyphenating – Da-sein – to emphasis its etymology: being-*there*. But in *Contributions to Philosophy* the hyphen takes on significance beyond etymology as it is no longer there simply to indicate an etymological distinction from being in the empirical sense, but to indicate a space between there (das) and being (sein), a phrasing that emphasises the dynamic potential of *space* itself – a *space* that Heidegger calls the *clearing*.

Beyng, then, is different from *Being* as an objective statement of things as they are. It is, as Heidegger puts it, "essentially distinct from the thinking known in 'logic' (i.e. metaphysics)" (*The Event* 33). *Being* is invested in the quantitative Kantian metaphysics of things as a "mere 'thought' or *only* a 'concept,' that represents an object" (Heidegger, *The Event* 174, my emphasis). While Heidegger's disavowing of metaphysical-logic as an objectifying representation clearly contests Lewis and Goodman's representationally bound and logically constrained digital ontology, my argument here is concerned with how the nature of the *Beyng* is addressed in the *event,* and to what extent this can resolve the circular paradox of differentiated representation[215] (Heidegger, *The Event*). However, it is worth pointing out that this rejection of metaphysical *Being* is what focuses Heidegger on the *event* as the revealing of the truth of being, through a *Beyng* that is lost in the subject-object relationships that logical thought demands. It is lost or forgotten about because in the *Being* world, truth (ἀλήθεια[216]) withdraws from us and is hidden behind the data, the quantification and the mathematics of metaphysical-logic to enslave *Beyng.* In this sense, the *Event* is not simply a temporal quantified moment in time but a new understanding – an original and unique occurrence of being in the event[217] that humans reveal through "inceptual thinking" (Heidegger, *Contributions* 101-108). In many ways it is easy to think about *inceptual thinking* in opposition to logical thinking in that it is not goal-oriented and lacks an agenda – an oppositional framework that shares much in common with the digital/analog dynamic. While to some extent this is helpful, I wish to escape such dualist, mutually determinant definitions and understand things in a fuller way that holistically takes into account what they are, what they are not *and* how they relate.[218] What is key, then, about *inceptual thinking* is that it is a "sovereign knowledge" that invents or projects the truth of *Beyng* (Heidegger, *Contributions* 93). It demands a different form of rigour, one which is not bored with itself and is prepared to wait. It is a type of thinking in which the essence of things is

not a stable or predetermined 'what' that we can grasp, nor a verifiable form of knowledge as proof. Rather, *Beyng* things are unstable, emergent 'hows' that gain their essence from *inceptual thinking* which happens in the *clearing* of the *Event*. *The clearing,* then is the potential of the space defined by the hyphen in da-sein. A space that "maintains the ontological tension between *Being* and *Beyng" and* forms the site of concealment in which the *Event* that is the revealing of truth by *Beyng,* can occur (Ebert).

The hyphenated space of *Beyng* is somewhat reminiscent of the temporal function of vector space discussed earlier with regard to *duration*. The suggestion was that with regard to dissolution of absolute time, *duration* also resembles the experiential spatiotemporal nature of the erleb. By extension it might then be assumed that the erleb functions as *Beyng*. Indeed, Heath Massey's account of Heidegger's treatment of Bergsonian time, supports this contention. Massey's assertion is that although Heidegger is critical of Bergson, his treatment of time is largely consistent with Bergson's heterogeneous conception of *duration* (Massey 18-19)[219] – meaning that theirs is a shared conception of time being something other than discrete quantifiable units of time. In this way, *Beyng* might also be taken to inform the amalgamated spatiotemporal construct of the erleb as a qualitative experience of concrete entities. This initially seems a valid counter-argument to Heidegger's stated criticism that *duration* is simply an inversion of the quantitative space-*is*-time construct.[220] Although Massey's argument is compelling, its value here is very specifically focused on informing the comparison between erlebs and *Beyng*. In this regard Massey's synthesis of Heidegger's criticism of Bergson is telling: "He fails to clarify temporality as the movement of transcendence by which *Dasein* is 'outside of itself' in the world" (Massey 209). In this, I suggest, lies the point of distinction between erlebs and *Beyng*. As much as the erleb internalisation of space and time might evade the recursive problems of other models considered here, it ultimately fails to resolve the question of "the

subjectivity of the subject" (Massey 210).[221] The erleb's internalisation of substance and time – its being *in* time – turns out to be as problematic as the externalisation of it by representation; a problem that *perhaps* ontology as the being of *Beyng,* is more adequate capable of addressing.

Having unpacked a more complex model of *Beyng,* we can now return with some insight to Harman's concise assertion that "*being is not presence", because "being is time" (Heidegger Explained 8),* and see how this might inform the problem of an ontologically committed being – a being invested in the essence of things as objects rather than time.

The most obvious comparison is that Heidegger's conception of the *Event* seems to refute my earlier assertion that differentiated representations are mutually exclusive relativist paradoxes, because if *being is not presence* then being could be representation and there could be such a thing as a differentiated representation. But for this to be true we cannot take being as purely ontological. It seems that for a thing to be in an ontological sense, it would need to have presence, as saying otherwise would mean that everything is, even if it has never had presence. And surely something that has no presence is not *Being*. Ontologically being must mean to be present. Therefore, in order for the digital to ontologically be, it must have presence rather than be represented. Representation thus negates *Being's* ontological presence, meaning that the digital cannot have presence if it is represented. So, when Harman, summarising Heidegger, says "being is not presence" he is challenging – as part of his argument against metaphysical logic – the conception of being as an ontological presupposition of being, and allowing for the homogeneity if not the simultaneity of the differentiation and representation (*Heidegger Explained* 1).

This assertion can be made on the proviso that "being is time" or, as we now understand it, *Beyng* is time. So, when Heidegger says that "an

immediate representation of something objectively present is never possible", he confirms the paradox of differentiated representations by qualifying it as not being *objectively* present (*Contributions* 41). This renegotiation of terms[222] from *Being* as object to *Beyng* as time, temporises ontology. But it does this in a quite different way to transcendental phenomenology. *Beyng* never fully transcends objects because "Da-sein is in itself 'ontological'" (Heidegger, *Contributions* 34). *Beyng* takes ontological priority[223] over objects not as a transcendent objectivity but as the object itself in the *event*. Ontology and epistemology, subject and object, the part and whole are one and the same in the *event* of what things are in themselves.

The paradoxes we have been wrestling with are not so much resolved as they are rendered obsolete.[224] They existed in the first place because of "the abandonment of being by being" (Heidegger, *Contributions* 88).

8.9 **When is art?**

Heidegger thus seems to have performed the impossible feat of *twisting free* from the *hermeneutic circle* that locks thinking into subject-objected, digital-analog dualisms.[225] *Twisting* turns away from the logic of metaphysics and *Being* by opening up a new space for a *Beyng* of temporal presence.[226] Whereas Floridi's Levels of Abstraction and Wheeler's 'its from bits' ontologies[227] – as symptoms of gigantism – invest themselves deeply in scientific rationalism, Heidegger pulls us back to one idea[228]: an idea that does not so much discredit fact-as-reason but refutes the exclusivity of reason as knowledge of being.

While in accordance with strict philosophical genealogy, it might seem harsh to sever the connection between a Husserlian transcendent phenomenology and Heideggerian post-metaphysical ontology, Heidegger did increasingly distance himself from the work of his mentor after *Being and Time*.[229] He came to see transcendental

phenomenology itself as a form of scientific theory that "wrongly reduces the mysterious things of the world to pieces of physical mass" (Harman, *Heidegger Explained* 24), which leads to the familiar circular conclusion that "logic seems to defeat the question" (Sheehan, "Reading Heidegger's 'What Is Metaphysics'"188). Phenomenology then, for Heidegger, is too grounded in "the basic rules of thinking" to address the paradoxes of differentiated representations (Sheehan, "Reading Heidegger's 'What Is Metaphysics'" 188).

Intersubjectivity, while appearing to negotiate an effective compromise between subject and object, never in fact escapes the primacy of thinking, as the subject is always objectified by a transcendent other. Subject-object relations are ultimately reduced to being, a representational trope that is reliant on metaphysical reasoning.

Serres' quasi-object, on the other hand, seems to negotiate this duality a little more successfully and appears more aligned with the event of *Beyng*. Like the quasi-object, *Beyng* refutes subject-object distinctions – as stated earlier, the quasi-object is both subject and object by virtue of not being either yet designating both (Serres, *The Parasite*). But *Beyng* demands more than a quasi-solution, for quasi-solutions are ultimately reliant on a transcendent position that recognises relations. In quasi ontologies there is always a transaction of sorts: for there to be an importer there must be an exporter, or at least an object or place other than that which imports. To make use of a Serres-like metaphor again, it would be clearly impossible to import text from a file unless that text already existed elsewhere on your computer or computer network. Like the loose leaf of paper that floats between folders on the windows file copy animation, Hermes as a translator is reliant on having a subject to make representations to.

For Goodman the syntactical structure of symbolic representation is consistent with the individuation of entities as phenomenal quale.

Functioning almost like an algorithm, the *time complexity* of erlebs provides a syntactical structure that internalises representation. It thus assumes a *substantive* method of being *in* time that bears some comparison with Bergson's qualitative treatment of time as 'duration'. To the extent that 'duration' is a rejection of the spatial determinacy of time, its motivation as argued is consistent with Heidegger's *Beyng*. Although the temporal internalisation of erlebs seems ultimately unable to twist free from the subjectivity of itself as subject, its ontology follows Heidegger in emphasising the 'how' not a 'what' of *Beyng*. In this broader sense, 'being *in* time' and 'being and time' are comparable ontologies.

By way of concluding this appendix and in anticipation of further development of Heidegger's method in the next, I want to briefly return to Goodman's conception of world-versions and consider his argument for art being a question of *when* rather than *what*. In *Ways of World Making,* by way of articulating his conception of world-versions, Goodman clarifies how representation functions with regard to what he calls the 'pure' in art.[230]

Goodman takes art – like science and philosophy – to simply be a mode of representation: one of many possible *right* world-versions that operate on an equal footing in terms of their relation to phenomena.[231] However, as Goodman himself acknowledged, this stance is perceived as being in conflict with some contemporary art practices – conceptual art in particular (*Ways of Worldmaking* 57-70).[232] Goodman summarises his perception of this position in a composite statement:

> What a picture symbolises is external to it, and extraneous to the picture as a work of art. Its subject if it has one, its references – subtle or obvious – by means of symbols from some more or less well-recognised vocabulary, have nothing to do with the aesthetic and artistic significance of character. What a picture stands for in

> any way, overt or occult, lies outside it. What really counts is not any such relationship to something else, not what the picture symbolises, but what it is in itself – what its own intrinsic qualities are. Moreover, the more a picture focuses attention on what it symbolises, the more we are distracted from its own properties. Accordingly, any symbolisation by a picture is not only relevant but disturbing. Really pure art shuns all symbolisation, refers to nothing, and is to be taken for just what it is, for its inherent character, not for anything it is associated with by some such remote relation as symbolisation. (*Ways of Worldmaking* 59)

In this statement – that claims to represent attempts by contemporary artists and critics to "isolate the work from whatever it symbolises or refers to", Goodman raises the question of what is "pure in art": is there an art form that represents nothing other than itself? (Goodman, *Ways of Worldmaking* 59 & 56). To this extent Goodman's statement does indeed reflect the aspirations of abstract painting, as championed by Ad Reinhardt, in which art is one thing – nothing but art (Reinhardt). In as much as the majority of Goodman's engagement with art is bias towards painting or at least two-dimensional work,[233] his framing of what he suggests is the 'dilemma' of what art is, is compliant with so called 'pure' anti art-as-life positions that pursue a subject without object as espoused by Reinhardt.

Goodman resolves this so-called 'dilemma' by arguing that even purely abstract paintings which claim to represent nothing external to themselves, are in fact representational through their "show forth" function, as mentioned earlier (*Ways of Worldmaking* 63-65).[234] Through this, abstract paintings exemplify (represent) qualities that are not inherent within the painting itself.[235] Under this rationale, every painting – regardless of its resemblance to anything else – is symbolic through either its internal content or its external exemplary function. Even though the

concept of *showing forth* is not developed by Goodman, it seems significant here but perhaps not in the way he would have intended.

Showing forth affirms Goodman's world-version irrealism under which everything affectively becomes a question of what is internally represented or what is externally indicated.[236] In fact, the difference hardly matters given that we remain insistent on only having phenomenal access to the world as quail, entities themselves are never available to us.[237] But *showing forth,* even as Goodman understands it, signals a significant shift in the ontological conception of *what* things are in themselves.

Goodman only goes part of the way towards recognising the implications of this, however, when he notes that "purist painting gives us a clue to the perennial problem of when we do and when we don't have a work of art" (*Ways of Worldmaking* 67). The underlying arguments here are consistent with the construct of *world-versions* that provide the syntactical schema for determining when a thing functions as a work of art: like *world-versions,* what things are changes, and so what they are is really a matter of how they are *practised* in a given time and space.[238] The question we should be asking, Goodman suggests, is not 'What is art?' but 'When is art?' (*Ways of Worldmaking* 66).[239]

In *showing forth,* the 'what' of ontology is temporised, shifting focus from definitive concrete assumptions towards an ontology of becoming in a way that clearly mirrors the temporality of *Beyng*. The 'when' of *showing forth* is the 'how' of 'what' is: 'When' and 'how' assume the same disposition toward 'what', such that we can reasonably align *showing forth* and *event.*[240] This infers that the unstable potential of the *event* as a revealing of truth entails a disclosure – a *showing* of *'what', of* what has previously been un-shown, unseeable or concealed. Thus the ontological turn made here by Goodman and Heidegger should also be taken as an epistemic turn, in that showing forth is an unconcealment –

as Heidegger takes it from the Greek aletheia – a method of knowledge production. This is an important connection to make with regard to the subsequent arguments, as it clearly positions the question of the digital as a differentiated representation in relation to method. In fact it seems to turn ontological definition into a method! But there is another point to make here regarding the question of 'When is art?

Drawing comparisons between ready-mades and finding a stone on the driveway, Goodman suggests that just as an object becomes a symbol at "certain times and under certain circumstances and not others, so an object may be a work of art at some times and not at others" (*Ways of Worldmaking* 66). Given this acknowledgement of the temporal dimension of art, it is surprising that Goodman is so dismissive of site-specific conceptual art practices such as Claes Oldenburg's *Hole* (1967) – especially as the analogy of the stone operates as such an obvious *double-negative* for Oldenburg's work (*Ways of Worldmaking* 66). Given the commitment to process that is evident in many such practices it seems crucial that any discussion of 'when art is?' should engage with them – evermore so perhaps because of their contemporaneity with Goodman's work. However, while inferring specific associations with abstract painting, as discussed regarding Reinhardt, beyond this one reference to Oldenburg, Goodman makes no reference to the conceptual artists such as those championed by Lucy Lippard ("Six Years"). Or for that matter those that feature in Jack Burnham's work on *real time systems* and *systems aesthetics*, an approach that seems largely consistent with Goodman's own. Despite this curious omission the question of 'When is art?' seems significant to explore with regard to such works as it can further inform the ontological definition of the digital as a practice.

Hetty Blades provides a point of entry here in her discussion of Allan Kaprow's *18 Happenings in 6 Parts* (1959), with regards to Goodman's treatment of dance notation. The focus of her analysis is the extent to

which the instructions or scores that Kaprow produced for *Happenings* can be taken as notational and thus as a representation in Goodman's terms. The question of notation is addressed in *Languages of Art* and while it focuses on dance and music its function regarding issues of representation and differentiation are applicable here (*Languages of Art* 127-173).[241] While Kaprow's instructions provided what might be considered a script for both performers and audience in a way that is perhaps akin to the function of programming code, as Blades – citing Andre Lepecki – points out, they fail to absolutely define what the performance consists of.[242] Rather, the notation defines a number of parts that might be rearranged indefinitely. Thus according to Goodman's theory of notation we cannot take any subsequent re-enactments of *Happenings* – such as Lepecki's redoing of *18 Happenings in 6 Parts* – as the same work even if they are produced from Kaprow's instructions.[243] In order for the reproductions of *18 Happenings* to be seen as the same thing as the original work, they must conform exactly to the notational representation of it: "No such latitude can be tolerated in the case of scores. Scores and performances must be so related that in every chain […] all performance belong to the same work and all scores define the same class of performance" (Goodman, *Languages of Art* 129). While Blades is correct in her interpretation of Goodman, her reading does not take into account the fact that Kaprow's scores included variables and so inherently authorises different arrangements. This does not, however, affect the point being made that two concomitant conditions together define what a thing – in this case a performance – is: the performance either needs to conform to its representation or the representation to the performance.[244] I want to stress again that this is not a causal dynamic – representation does not define the subject as might be inferred from the *world-version* construct. Syntacticly representational systems are dependent on semantic subjects for their structure as much as semantic subjects are reliant on representation syntax for their meaning (Goodman, *Ways of*

Worldmaking 226). Ontologically art *becomes* when syntax and semantics coincide.

Here again the resonance with Reinhardt's assertion that "Art is not what is not art" makes it clear why Goodman would address abstract painting. However, given equally clear parallels with a statement such as Joseph Kosuth's "art is the definition of art", and even more so considering Kosuth's engagement with semantics and language, it is hard to understand Goodman's general lack of engagement with conceptual art practices. This, I suggest, identifies a significant limitation in Goodman's work, one that perhaps limited his ability to fully extend the concepts inherent in the question of 'when art is'. Perhaps because in taking art out of an immediately identifiable gallery context, Goodman saw works such as Oldenburg's *Hole as* affectively removing themselves from the syntax of understanding. However, this of course was neither the case nor the point; they were not without syntax even if Goodman was reluctant or unable to recognise it. But surely – unless the *showing forth* nature of 'when art is', unless the practice of its becoming is fully entertained as part of its syntactical structures – entities in themselves can have no semantic value in representational/notational schemas.

From an ontological perspective, pursuing the temporal aspects of *when and how* art is, thus becomes a significant factor in developing a definition of the digital. While this appendix has explored this issue in depth, there are some further aspects of Goodman's work that are useful in resolving the relationship between differentiation and representation that should be addressed.

Following the established representational construct, we can understand that for things to be differentiated they should be semantically operative within the same representational syntax or world-version in order for them to be differentiate as subjects. If they were differentiated on the basis of syntax then it would be the *world-version* rather than the subjects that

were differentiated.[245] To put that more simply: you can only compare two things that exist within the same terms of reference, otherwise what you are comparing is the terms of reference.[246] This means that in order for differentiation to be ontologically instructive – for it to be useful in defining the digital – the epistemic frame of reference for subjects should be the same. Subjects thus form epistemic classes of representations – or *world-versions*. But again the problem identified earlier arises: every time something is represented either as a notational reenactment or as a phenomenal perception it becomes a class, in which case it is no longer an individual that we can differentiate from other individuals. Effectively what this seems to imply is that it is impossible to separate out ontology and epistemology in the way representation demands and is inherent in Goodman's *world-version* syntactic. Connecting syntax with epistemology and semantics with ontology in this way is undoubtedly not what Goodman would have intended. For him, world-versions constructs were not epistemic descriptions but rational reconstructions (*Study of Qualities* 96-8).

Lars Leeten, however, provides the basis for an alternative reading of Goodman and suggests that while Goodman is typically framed in non-epistemic terms, his conception of philosophy can be taken as a re-conception that presupposes the primacy of *practice* or *when* things are (31). Following Charles Taylor, Leeten argues that Goodman is better understood from the perspective that "knowledge cannot be separated from the practical standpoints", standpoints that are fundamental to knowing beings and which show their value in "*use* alone" (36 & 38). Effectively what this implies is that rather than seeing Goodman's representationalism as necessitating a separation of ontology and epistemology and thus of syntax and semantics, it can be read as part of the "repudiation of the whole [philosophical] foundational enterprise" that aligns it with the assertion that we are, first and foremost, agents in the world[247] (Taylor 2). The point here, however, is not to argue the case for agentic ontologies – as this is indeed the focus of Appendix 10 – but

rather to both provide a framework for thinking about Goodman's definition of the digital that avoids the seeming contradiction of the coupling 'differentiated representation', and makes sense of putting into practice the proposition presented by 'when art is'.

[1] While *Smalltalk* crystallises many of OOP key functions through the implementation of recursive objects, Kay locates its development within the continuity of other programming languages, notably *Sketchpad* and *Simula*. *Smalltalk* embodies core OOP concepts of *objects*, *messages*, *classes, inheritance* and *method* that form the foundation of subsequent OOP languages such as C++ and Java (Porter). However, in referencing Thomas Kuhn, Kay immediately positions computing within broader discourses, not least related to scientific method (Kuhn 111-134).

[2] Kay contextualises this "larger pursuit" as part of the agenda of personal computing promoted by ARPA and later Xerox / Palo Alto Research Centre, while Goldberg and Robson acknowledge the continuation of this goal in the 1980s under the new name of the Software Concepts Group (1993; 1983).

[3] I refer here to the reconstruction of key works by Jim Allen since 2014, but prior to that the exhibition "Action-Replay: Post-Object Art" (1998), both of which are indebted to ongoing research in this field most notably that of Tina Barton who since her 1987 MA thesis has worked on the legacy of Post-object Art in New Zealand. Wystan Curnow, Tony Green and others also continue to publish work related to Post-object Art including the recent exhibition of Bruce Barber's *Mt Eden Crater Performance* (1973).

As an undergraduate student at Auckland University, Elam School of Fine Arts in 1978, I was directly influenced by Phil Dadson who had recently established an intermedia department at Elam. Ongoing collaborations with Dadson and an extended dialogue with Allen continue as a backdrop to my independent projects.

[4] "The monad, of which we speak here, is nothing else than a simple substance" (Leibniz, *Discourse on Metaphysics* 111).

[5] Strictly speaking of course, objects belong to classes that combine data and methods, but it unnecessary to develop this in depth here.

[6] Inheritance is used here in the contemporary understanding of object or class inheritance, not in the terms that Kay uses where inheritance is conceived of at a computational level: the "Smalltalk object is a recursion on the entire possibilities of the computer" (Kay 4).

[7] "The monads have no windows through which anything may come in or go out. The Attributes are not liable to detach themselves and make an excursion outside the substance, […]. In the same way neither substance nor attribute can enter from without into a monad" (Leibniz, *Discourse on Metaphysics* 111). Although Leibniz is referenced throughout this document the construct of the monad is developed in further in 8.2.

[8] *Titled (Art as Idea as Idea)* is a series of photostats of dictionary definitions that Kosuth produced between 1966-68.

[9] Of these, the *principle of sufficient reason* is discussed in more detail in Subappendix 1"I'm the only one who got it right". *The Monadology* itself is a relatively short text of 90 paragraphs.

[10] *Simple substance* is, of course, not a term unique to Leibniz and there have been various interpretations of it since Aristotle. Although some further limited discussion of simple substance occurs in section 7.7.1, it is not necessary to develop this concept in full. In general, what needs to be understood here is that philosophical *substance* refers to the concept of an object as a foundational entity, within a given epistemic framework. Thus the definition of what is meant by *simple substance* necessarily changes according to the epistemic stance. Although in Leibniz's case this is sufficient reason, it is in fact God that provides that reason.

[11] "The principle of Sufficient Reason, in virtue of which we believe that non fact can be real and no statement true unless it has a sufficient reason why it should be thus and not otherwise" (Leibniz, *Discourse on Metaphysics* § 32). In Appendix 10, the necessity of *sufficient reason*, or causation, is developed further with regard to the determinacy of the digital thing-in-itself.

[12] Draft letter of 14 July 1686.

[13] Letter of April 30 1687.

[14] This bounce back or doubling is a metaphor that resonates through this text as the tension between the thing-in-itself and the world is played out.

[15] I am using the more common contemporary translation here: §22 "And as every present state of a simple substance is naturally a consequence of its preceding state, so its present is pregnant with its future." (Rescher, *Leibniz's "Monadology"* 22). In earlier translations this appears as "Every present state of a simple substance is a natural consequence of its preceding state, in such a way that its present is big with its future" (Leibniz, *Discourse on Metaphysics*).

[16] The full and earlier translation of this section reads: "All simple substances or created monads maybe called Entelechies, because they have in themselves a certain perfection (ἐχομσι τὸ ἐνετλὲς) There is in them a sufficiency (αὐταρκεία) which makes them the source of their internal activities, and renders them, so to speak, incorporeal Automatons (Leibniz, "Discourse on Metaphysics", §18). The term entelechiea or entelechey – that which makes potentials actual – literally holds its goals in it – is internalised here by Leibniz. This not only forms and

locates the construct of the monad metaphysically but also anticipates the later philosophical self-becoming of Heidegger's Dasein.

[17] Maley articulates this as a 'received view': "Similar to `analog' and `continuous', the terms `digital' and `discrete' are synonymous under the *received* analog/digital dichotomy" (9 my emphasis).

[18] Evens adopts the description of the digital as discrete from the very outset of *Logic of the Digital* without attributing the term *(Logic of the Digital* 1-4).

[19] Although the conceptual function of pointing aligns with later arguments presented here, Evens' use of it is limited to human-interface actions such as the touch screen *(Logic of the Digital* 72). Although he does recognise pointing as a form of "action at a distance", his argument is constrained by the etymological conception of the digital that connects it to the finger *(Logic of the Digital* 71 & 16).

[20] "I will defend and extend David Lewis' account of analog and digital representation"(Maley 1).

[21] As Daniel Andler suggest, "Cognitive science and mathematics do not relate to one another as two well-defined, stable entities" (363). Given that Lewis builds his argument using mathematical logic statements and acknowledges a technological focus, these are taken here as concomitant.

[22] In Chapter 3, *Mediation*, Evens recognises that the problem of interfacing with the computational digital object shares much in common with the broader metaphysical questions regarding the connection between subject and object. However, he then rarifies the digital object by constraining it to the computational and asserts that, unlike actual objects, the immateriality of the digital object evades directive, subjective access. Although this argument holds within the context he establishes, it is limited in its understanding of materiality and metaphysics. With a more in-depth understanding of these philosophical issues, the digital object should, I argue, no longer be computationally determined.

[23] That said, Hui's most recent book – *The Question Concerning Technology in China: An Essay in Cosmotechnics* – considers Heidegger's critique of technology in the context of Eastern Philosophy. Due to its publication in December 2016, this text has not been included in the thesis.

[24] Hui provides this reading of Simondon: "Simondon retains the technical meaning of transduction as a means of communication and transmission. Furthermore, he identifies transduction as the third way of reasoning beyond (and juxtaposing) induction and deduction, giving rise to a type of thinking that doesn't move unidirectionally from inside to outside, outside to inside, individual to collective, collective to individuals, but rather presents itself as a process of the *transformation of forms and structures*" (*Existence of Digital Objects* 192). The intersubjective and relational concerns inherent in this bear comparison to the reading of quasi-objects, erlebs and monads discussed; however, the practical methods used in this research open up other possibilities and lead to significantly different conclusions.

[25] Particularly with regard to Heidegger.

[26] Echoing the expanded fields commitment to 'boundary concepts', Jack Burnham's Systems Aesthetics – that is introduced in Appendix 9.1.3 – positions media as a system defined or invented by the artist rather than that given in a substance such that "medium has less to do with the physicality of the support than with a system of "rules." (Burnham, "Systems Aesthetics" 31-32 & Krauss,'*Specific' Objects*,, 222)

[27] The term 'flattened' is used here specifically in relation to the flattening of the ontological field that is central to the argument in Appendix 10 – see specifically 10.2.2. Although the suggestion that an expanded field might be articulated as an ontological flattening could be developed further, my purpose here is simply to provide a context for the Post-object art practices that frame the inquiry throughout Appendix 9 and beyond.

[28] Reference is made here to Theodor Adorno's *Negative Dialectics* which - in contrast to identity, thinking – questions the necessity of causation (234). While these ideas are not developed further until Appendix 10.1, they are introduced here to frame expanded sculptural practices in regard to questions of *contingency* or reason in flattened ontologies – later referred to as Speculative Ontologies. See pages 173 – 179.

[29] This is unnecessary for Hui as he assumes a computational given of the digital. Hui does, however, address the notion of representation, but this is largely in regard to the knowledge constructs of code and data and tends not to address the greater epistemic concerns raised here (*Existence of Digital Objects* 2; 50).

[30] As will be argued in Appendix 9, method and ontology are intimately connected.

[31] It should be noted that while Maley acknowledges Goodman as the "first philosopher to analyse the so-called analog/digital distinction", his argument is focused on Lewis' 1971 paper.

[32] In his later work Goodman indirectly concurs with this criticism (*Reconceptions in Philosophy* 126). Although this criticism will not be directly addressed, the significance of the subsequent text is covered in *World Making*.

[33] Dialectics is touched on briefly in 9.1.

[34] Among these are Bertrand Russell, Alfred North Whitehead, C.I. Lewis, Willard Van Orman Quine and Henry Leonard.

[35] 'Formal' is used here in the epistemic sense in which logic and mathematics are used as a form of knowledge construction by Gottlob Ferge (*The Basic Laws*). In Appendix 9 it takes on a different meaning with regard to Heidegger. See section 9.2.1.1. While in Appendix 10 it again comes under scrutiny as a method in the context of Speculative Realism.

[36] Although Goodman and Lewis share similar mereological perspectives this statement is validated on the grounds of their treatment of classes.

[37] There are of course differences in how a singleton is defined. With regard to this, Lewis acknowledges other, structuralist interpretations that advance his own. See Lewis *Parts of Classes*, 45 - 57 for a summary of interpretations. When referring to singletons here, however, I will take it as Lewis describes it within "standard iterative set theory" (*Parts of Classes* 45-54).

[38] Although this bears some similarity to a "simple substance", it is not articulated in quite the same metaphysical terms. Lewis approaches them in a much more atomistic or platonic sense. See section 8.7.1.

[39] Goodman does admit some abstract entities but this is discussed later in regard to predicate logic.

[40] See Russell Paradox in section 8.3.1.

[41] The origins of this can be traced to Georg Cantor whose influence on the mathematical conceptualization of collections of rational numbers as objects in their own right, provided a logical construct that formalized computational reasoning (Winskel 3-4). Set theory is discussed further in 8.3.1.

[42] See section 8.4.

[43] Mereology – the study of parts and wholes stems from Greek philosophy but became a central issue for realist philosophers due to its epistemic implications.

[44] Framing practice as ontology here anticipates Heidegger's ontological 'turn' that is introduced in 7.8.

[45] It seems unnecessary to declare this, but for the sake of clarity this is not a statement of sculptural method along the lines of convention which would classify art on the basis of reproductive, additive, constructive, and substitutive processes. If there is any relevance in these terms it is as the subject of mereological inquiry rather than practice.

[46] For example, nominalism, to which Goodman prescribes, is typically seen as being opposed to realism, while Goodman's irrealism is itself consistent with many aspects of realism.

[47] Unlike phenomenology, phenomenalism denies the existence of things in themselves and supports only the existence of sense data.

[48] In formal logic statement $\exists$ means 'there exists' and A operates a predicate symbol for w ("Symbolic Logic", n.d).

[49] Predicate logic is a symbolic method in which predicates indicate the relationship between symbolic constants and variables. For Goodman this operates in both common language statements as verbs qualify nouns, and in abstract equations in which symbols qualify variables. To some extent Goodman is less interested in the truth function of predicate logic for reasons that ill be explained.I am using the term predicate logic here as opposed to the more contemporary term first-order logic in order to signal a philosophical intent, and to distance my argument from computational frameworks.

[50] Set Theory can be taken here in the general sense as "a branch of mathematics that studies collections of objects" (Lian 1).

[51] As a first order theory, set theory uses predicate logic syntax.

[52] Aufbau translates to structure as in the title of Carnap's *The Logic Structure of the World* – Der logische Aufbau der Welt.

[53] Although this relationship is not developed, Goodman seems indebted to Leibniz for the Identity of Indiscernibles which holds that two differentiated things can fully resemble each other (Leibniz, *Discourse on Metaphysics* section 9).

[54] While admittedly for reasons of clarity this will preclude discussion of many aspects of Goodman et al. work, it does not negate the argument made with regard to the digital.

[55] This approach is frequently taken and tends to dominate or at least frame readings of Goodman's work (see Daniel Cohintz and Marcus Rossberg's *Nelson Goodman,* 2006*)*. David Hume posed the problem of inductive reason as a riddle – known as the *Riddle of Induction*. The riddle as stated by Hulme is "that there can be no *demonstrative* arguments to prove, *that those instances, of which we have had no experience, resemble those, of which we have had experience*" (Hulme, *Human Nature* 46).

[56] It should be noted here that the questions of the relationship between parts and whole is not constructed by Goodman and Leonard alone and has its origins in Presocratian philosophy. More directly, as they acknowledge, it is attributable to Stanisław Leśniewski's formulation in

*On the Foundations of Mathematics (*1927-31). Because Goodman developed Leśniewski's work in English, his has become the basis of contemporary mereological ontologies.

[57] In the most basic way this is a form of 'worldmaking' – as Goodman calls it, that might be considered as a Kuhnian paradigm shift. The relationship between worldmaking and monads – as discussed earlier in regard to Kuhn and Leibniz, will be discussed in 7.4.

[58] The relationship between set theory and predicate logic is the assumption that every predicate determines a class or set. Thus a black dog is defined as a class distinct from dogs in general by the predicate black.

[59] First proposed by William of Ockham in 1325, nominalism argues that only concrete entities are extant. Two primary nominalist positions have derived from Ockham, one which refutes the existence of Universals; the other which reject the existence of abstract entities. Goodman's Nominalology is a third variant which finds its roots in Ockham's initial conception developed through similar predicate arguments (Tornay 250-251).

[60] There are many examples of this that could be given here but perhaps the most direct are given by Michael Shenefelt and Heidi White: "This sentence is false." (If true, the sentence is false; yet, if false, it is true.) (234).

[61] I have used this source as it is more concise than the fuller explanation which Russell published in *The Principles of Mathematics,* 1903, 101- 105. However, this is of little significance as the point is to affirm that although formal logic has its own language, Goodman was concerned with articulating the ideas in simple language.

[62] Strictly speaking the Russell Paradox is a problem of naive set theory rather than axiomatic set theory, however the extension of the argument the same.

[63] I have stressed mathematically here as the resolution of the paradox rests on concepts of finitude that will be addressed subsequently.

[64] While I have cited this text in order to signal the involvement of Whitehead in formal logic, Russell had previously published *Mathematical Logic as Based on the Theory of Types*, 1908.

[65] Axiomatic set theory, first developed by Ernst Zermelo and Abraham Franenkel establishes procedures for defining individuals within infinitely large sets such as 'all dogs'. This is now known as Zermelo-Fraenkel set theory. Although the mathematical basis of set theory was established by Georg Cantor, Zermelo and Fraenkel axiomatic set theory is taken as the point of reference here as it directly relates to computation models.

[66] D. Lewis' Modal Realism and Goodman's Irrealism are similar in that they allow for plural world constructs.

[67] Generally speaking, there are thought to be two forms of Nominalism – one that rejects abstract and the other that rejects universals. Goodman sits somewhere between these two in that he is selective and reject some forms of both abstract and universal entities. This causes some confusion as typically Nominalism is seen as aligning with idealist claims that realist is mind-dependent when in fact Goodman is more consistently realist in his outlook. The difficulty in positioning Goodman is typical of the pluralism that he espouses and reflects his positioning of himself as an irrealist.

[68] Like Russell's adoption of Types, Quine's work around is to admit attributes as "classes with a difference" ("On the Individuation" 100).

[69] In 1940 Goodman and Henry Leonard published *The Calculus of Individuals and Its Uses.* In many ways formulating an alternative to the calculus of classes with regard to the mereological differentiation of individuals, *The Calculus of Individuals* forms the basis for the extensional isomorphism that appears in Goodman's *The Structure of Appearance*. Determining the individuation of entities though logic statements concerning "overlap" without the use of classes, the Calculus of Individuals aims to establish an alternative to set theory. Although relevant to the critique of set theory, the methods of construction do not alter the broader serological framework set forth here.

[70] In "Steps Toward a Constructive Nominalism", Goodman sets out to define elements of a nominalistic syntax by rewriting Platonistic statements in such a way that they perform the same logic without necessitating abstract entities. He continues to use this strategy in subsequent works with regard to music, picture, notation *and* representation*,* although without the mathematical details provided in "Steps Toward a Constructive Nominalism".

[71] Worldmaking is the central topic of Goodman's 1978 book, *Ways of Worldmaking*.

[72] See the qualification of these terms in section 8.3.

[73] In *Ways of Worldmaking*, Goodman addresses the implications of inductive and deductive reasoning with regard to truth statements (125 -129). As will become evident later, Goodman's construct of *world-version* is premised on inductive approaches.

[74] This would be contrary to the Law of the Indiscernables which states that no two things can have the same properties (Leibniz, *Discourse on Metaphysics*).

[75] The question of time that is brought up here is developed in 8.7.2.

[76] Developing that variable in terms of computational variables, we could note than in fact the colour black in RGB is defined by three variables 0,0,0 as opposed to white that defined as 255,255,255. In binary code these are of course themselves defined by bytes as

(00000000,00000000,00000000) and (11111111,11111111,11111111) respectively. Thus we see that variable 'colour' is itself several steps removed from the binary code itself and provides an example of the sort of class inheritance that Goodman opposes.

[77] This point is not unique to Schwartz et al and is fact a standard Computer Science curriculum as evidenced by Glynn Winskel, *Set Theory for Computer Science* text book. However, as acknowledged by Cantone et al., Schwartz has contributed to affirming this correlation since the 1970s (*Set Theory for Computing*).

[78] D. Lewis' only reference to the digital is in *Analog and Digital.*

[79] The binary nature of the bit itself is not a question of discreteness any more than a dog that has back and white spots is two dogs.

[80] Goodman qualifies his assumption of finitude with reference to the spatio-temporal dimension of quantum physics. I have omitted that here for reasons of clarity.

[81] See 8.7.2.

[82] Goodman himself describes such systems as "symbol systems" (*Reconceptions in Philosophy* 126).

[83] As defined by Goodman in *Fact, Fiction and Forecast*, "a hypothesis is projectable when and only when it is supported, unviolated, and unexhausted, and all such hypotheses that conflict with it are overridden; non-projectable when and only when it and a conflicting hypothesis are supported, unviolated, unexhausted, and not overridden; and unprojectable when and only when it is unsupported, violated, exhausted, or overridden" (108).

[84] Although it is not possible to make a full comparison here, D. Lewis' modal realism has much in common with Goodman's conception of world-versions. D. Lewis advocates for this in *On the Plurality of Worlds*, where he proposes "a thesis of plurality of worlds, or modal realism, which holds that our world is but one world among many" (2).

[85] *Grue* is a term coined by Goodman in *Fact, Fiction and Forecast,* where he uses it to present the *New Riddle of Induction,* a reframing of Hulme's riddle of induction that problematises our ability to make predictions about future events. *Grue* and *bleen* are used as alternate predicates to green and blue as a way of presenting the argument for *world-versions* (Goodman, *Fact, Fiction and Forecast* 72-81).

[86] More correctly this might be stated as *notational* system but to avoid the introduction of yet another term I have dropped this.

[87] "Two marks are character indifferent if each inscription and neither one belongs to any character the other does" (Goodman, *Languages of Art* 132).

[88] "*For every two classes K and K' and every mark m that does not actually belong to both, determination either that m does not belong to k or that m does not belong to K' is theoretically possible*" (Goodman, *Languages of Art* 135-136). In later work Goodman uses the term *effectively differentiated* to describe the same conditions (*Reconceptions in Philosophy* 125).

[89] "A character is ambiguous if any inscription of it is" (Goodman, *Languages of Art* 147).

[90] "We may consider the *disjointness requirement* to stipulate *that no two characters have any compliant in common*" (Goodman, *Languages of Art* 151).

[91] "*For every two classes K and K' such that their compliance-class does not comply with both, determination either that h does not comply with K or the h does not comply with K' must be theoretically possible*" (Goodman, *Languages of Art* 152).

[92] I would venture that this can also be taken as the difference in relationships found in set theory's isomorphism and Goodman's extensional isomorphism that is central to his calculus of individuals (*Structure of Appearance* 10-16), although these are not addressed directly here. It is also worth noting that this relative positioning parallels the distinctions drawn later regarding Object Oriented Ontology and New Materialism. See 10.2.3.

[93] The significance of finitude is developed in 8.7.2.

[94] Phenomenal is taken as the quail, substance or sense-data of the world that appears to us while phenomenology is the investigation of what happens to us when we perceive that world.

[95] The definition of metaontology used here reflects a general concern with the subject of ontology itself but also raises the poignant question of how this meta position affects the constitution and determination of ontologies. Recent metaontological analysis tends to focus on the debate Carnap and Quine. Stephan Blatti and Sandra Lapointe's *Ontology after Carnap,* 2016, provides a contemporary reading of metaontological issues while Jonathan Schaffer's *On What Grounds, 2009,* provides a mereological analysis that is specifically relevant here. The latter revolves around the tension between Aristotelian and Quine/Carnap metaphysics which appears in Goodman as a nominalistic critique of platonic ontologies. Schaffer's classification of metaphors into flat, sorted and ordered structures provides a clear overview of these positions (*On What Grounds* 354-356). As the argument regarding representation can be made here without expanding on these works, it is not developed in full.

[96] I have included the Unicorn here with reference to Goodman's use of it to point out that even though things may not exist they can be represented (*Ways of Worldmaking* 58-61).

[97] Following Schaffer in sorted structures, "The target of metaphysical inquiry is (i) the number of categories n, and (ii) lists E1 − En of entities in each category" (355).

[98] See 8.3.1: Let *w* be the predicate: to be a predicate that cannot be predicate of itself. Therefore, we must conclude that *w* is not a predicate." (Russell in Van Heijenoort, *Frege to Gödel I* 124-125).

[99] "From this I conclude that under certain circumstances a definable collection [Menge] does not form a totality" (Russell in Van Heijenoort, *From Frege to Gödel* 124-125).

[100] "Since the misleading traditional terms "analog" and "digital" are unlikely to be discarded, perhaps the best course is to try to dissociate them from analogy and digits and a good deal of loose talk, and distinguish them in terms of density and differentiation – though these are not opposites." (Goodman, *Languages of Art* 160).

[101] The dissociation of the digital from digits, which is also part of this quote, is acknowledged in the citing section with regard to Aden Evens' use of it.

[102] Goodman's statement regarding what he calls 'loose talk' is taken as being a criticism of D. Lewis, Russell and Whitehead's admission of classes as individual entries, as explained.

[103] "Analog representation of numbers is representation of numbers by physical magnitudes that are either primitive or almost primitive according to the definitions above" (D. Lewis, "Analog and Digital" 325). Note the stipulation of primitive is conditional upon adherence to the conventions of physics which, following Goodman, is simply a world-version 'rightness' not an absolute truth (D. Lewis, "Analog and Digital" 324). Digital representation, on the other hand, is "representation of numbers by differentiated multi-digital magnitudes" (D. Lewis, "Analog and Digital" 327).

[104] I suggest that the complexity comes not just from the mathematical formulations entailed in D. Lewis' argument, but that it requires a familiarity with Goodman's key concepts as outlined. In this regard, Epp's analysis suffers form the limited extent with which it engages with Goodman.

[105] Specific terms are italicised in the following statements.

[106] Although, strictly speaking, D. Lewis allows from some laxity around the level of accordance.

[107] Even with consideration of the *Calculus of Individuals* Goodman's core mereology remains consistent with this statement. See 8.3.

[108] Unlike the examples of representational paintings Goodman provides, he never directly references abstract artists. However, his description of them corresponds with paintings by Frank Stella and Sol LeWitt of that same period. The statement quoted here, however, seems to be made with reference to ideas such as those put forward by Ad Reinhardt, in which art is one thing – nothing but art (Reinhardt) – but also, by way of reference to Claes Oldenburg, to conceptual art (*Ways of Worldmaking* 66). This is elaborated on in section 8.9.

[109] An example of the application of intrinsic and extrinsic representation is discussed in Goodman and Leonard's "Calculus of Individuals".

[110] Goodman's conception of *showing forth* is addressed again in 8.8.

[111] In *We Have Never Been Modern*, Latour arguing for an end to asymmetry asserts that subject and object poles are modern dialectic construct of a Nature and Society divide (Never Been Modern 91-96).

[112] De Beer takes Serres 'encyclopaedic' analysis of order and disorder as a call for a new kind of thinking which he calls "differential thinking" (4). More holistically Serres treatment of order and disorder can be taken as a means critiquing dialectics as Latour points out: "Instead of believing in divides, divisions, and classification, Serres studies how any divide is drawn, including the one between past and present, between culture and science, between concepts and data, between subject and object, between religion and science, between order and disorder and also of course, divides and partitions between scholarly disciplines" (Latour in Griffith, 93).

[113] In doing so I also place the construct of 'Critique' itself in parenthesis as being what Serres would prescribe as a dualism of conflict. While I will not develop this argument here, this position that Latour argues is naively ineffective is both an argument presented in this thesis and a methodological strategy that treats all forms of representation as "material on which to experiment for an argument to gain some meaning" (Serres, "The Enlightenment without the Critique" 96). This in part provides the rational for the basis of the *practice of the audience* as both method and the form of this thesis.

[114] Serres expands on this, explaining that: "Dialectics recites a logic so impoverished that anything and everything can be drawn from it. In it you have only to set up a contradiction, and you will always be right. Ex falso sequitur quodlibet – From the false comes anything. Contradiction enables you to deduce anything from anything. Ever since the invention of classical formal logic we have known that it's possible to deduce anything, true or false, from contradiction, from the pairing of true and false, and that this deduction is valid" (Serres and Latour, *Conversation on Science 155*).

[115] In *We Have Never Been Modern*, Latour discusses the intermediary role of the quasi-object in regard to the dialectics of a Nature and Society but also Object and Subject: "We do not need to attach our explanations to the two pure forms known as the Object or Subject/Society, because these are, on the contrary, partial and purified results of the central practice that is our sole concern. The explanations we seek will indeed obtain Nature and Society, but only as a final outcome, not as a beginning. Nature does revolve, but not around the Subject/Society. It revolves around the collective that produces things and people. The Subject does revolve, but not around Nature. It revolves around the collective out of which people and things are generated" (79).

[116] This in consideration of the distinction between *matters of fact* and *matters of concern* that are discussed in 8.6.2.

[117] Referenced again in 10.3.3, Verwoert's questioning of the imperative of legitimacy that arises from 1960s conceptual art, problematises the binary opposition of 'I can' and 'I can't', right and wrong that are developed here in regards to the digital. This association substantiates several key connections made of this thesis in terms of the absolute legitimacy of reason as knowledge, the performative function of practice in evading the dialectic limits of reason, and the position of 1960s conceptual art in articulating these concerns (*Exhaustion and Exuberance)*.

[118] Methodology is articulated in Appendix 9.

[119] Serres frequently draws on a comparison between such things as Lucretius clinamen – an unpredictable swerve of atoms, and hydrodynamics (*Conversation on Science* 56). Although often criticised for his use of this method as being a "free association of arbitrary rapproachments" (Latour in Serres, *Conversation on Science* 63), he is clear about the strategy as a temporality. I discuses this topic elsewhere in relation to constructs of time, presence and the digital.

[120] A position that resonates with the position of New Materialist ontologies discussed in 10.2.3.

[121] Serres' reframing of intersubjective human relations as exploitative rather than mutual, is articulated through the metaphor of the *parasite* and is taken by Watkins as significant in the field of post-humanism (*The Parasite)*.

[122] This is pointed out here in order to establish connections between different parts of the thesis.

[123] *Hermes* is a central concept in Serres conception of intersubjective relations and is conceived of as a messenger who "travels across time and space, making unexpected connections between seemingly disparate object and events" (Roxanne Lapidus in Serres, *Conversation on Science,* vii). The Greek God is however a far more complex character portrayed by this explanation. As well as being a messenger Hermes is also the god of boundaries and transitions and is portrayed as being ingenious and cunning in character. As such Josue Harari and David Bell in the introduction to *Hermes.* Framing Serres metaphorical treatment of the god as an *anti-method,* they provide an account of Hermes in regard to Greek myth, philosophy, science and literature (*Hermes*, xxx-xxxvi).

[124] While Serres discusses the construct of ball play, the notion of the ball is also made interchangeable with the 'Furet' – ferret, a quasi-object that defines us but also threatens us so that we seek to pass it on quickly (*The Parasite* 224).

[125] Something which I would normally avoid, but in the context of Serres's work it seems appropriate.

[126] This thesis then must reject technologies of digital representation in favour of sculptural materialist approaches to the digital itself.

[127] This paradox might also be thought about in terms of the tension between sympathy and apathy in Nigel Thrift's account of *Non-Representational Theory*. While the the position being developed here can be seen as aligned with broader philosophical approaches to time and becoming, Non-Representational Theory's commitment to embodiment – and though it the biopolitical, is insistent on an anthropocentric vitalism that is seen as limited in the context of non-correlational vitalism introduced in Appendix 10 (Thrift 253).

[128] By way of making connections with previous arguments, Evens' *The Logic of the Digital* bears some comparison. Reinterpreting Gilles Deleuze through Alexander Galloway, Evens articulates the logic of the digital as a dividuation that is the flow of recombinant bits and emphasises an ontolgocial entanglement that is derived from the substance-less condition of the digital (*Logic* 43-45). While seemingly empathetic to the quasi-object, Evens does not examine the epistemic construct of logic itself per se, and remans constrained by dualist conceptions of the digital that I seek to avoid here.

[129] I have retained Bryant's use of humanist and antihumanist here however this is clearly a reading indented to position Latour in relation to Object Oriented Ontologies treatment of relationally. It is perhaps now more useful to think of this human/antihuman ambivalence in terms of the anti-humanism position that Rosi Braidotti acknowledges as a deconstruction of humanist individualism that results in a "de-linking the human agent from this universalistic

posture, calling him to task, so to speak, on the concrete actions he is enacting." (23).

[130] Specifically, through Boyle's artifactual critique of constructivist methods (*Never Been Modern* 17-20).

[131] The problematisation of this signals a fuller discussion of epistemic claim to knowledge that is addressed in Appendix 9, but also points to the question regarding the contingency of reason that is discussed in Appendix 10.

[132] These terms are taken as defined by Steven Luper: "Ontological relativism denies that there is but one objectively correct characterisation of reality, while epistemic relativism denies that there is only one correct epistemic standard" (271). While in one sense relativism may be seen as the epitome of correlationalism, the qualifiers of ontological and epistemological each destabilise anthropocentric relativism for the other. Latour is very clear on his position regarding relativism and while he is critical of certain modes of relativism, he categorically states: "Of course I am a relativist" – although this needs to be qualified ("Bruno Latour: The Relativist"). Latour provides this in *We Have Never Been Modern,* articulating his form of relativism as *relative relativism*, a definition consistent with Luper's definition of epistemic relativism (*Never Been Modern* 113).

[133] Although this appears to be a contradiction, Latour is clear about his position, asserting that the distinction results from a confusion about category distinctions not about relativism ("Bruno Latour: The Relativist").

[134] Maters of concern v maters of fact (Latour, "Why Has Critique" 231).

[135] Dialectics and Negative Dialectics is discussed further in 10.1.

[136] Although nonsense is clearly different from the concept of *unreason* developed in 10.3, both stem from the problem of correlationism and subject-object relations.

[137] Although the reference here is to Edwin Hubble's conception of the Expanding Universe Theory which was significant in informing the Big Bang Theory of the universe, in 10.2.3 the same raisin-bread dough model is used with regard to C. D. Broad's Growing Block Universe, as cited by Tristan Garcia with regard to questions of time and duration.

[138] This pre-empts the discussion of correlationism that is addressed Appendix 10.

[139] Latour's treatment of Heidegger in this respect is different from Graham Harman who reconstitutes a withdrawn, inward-looking fourfold. This distinction is discussed further in 10.2.

[140] "Iceland boasts of having the oldest Parliament, which they call Althing, and you can still visit many Scandinavian countries' assembly places that are designated by the word Ding or Thing" Latour "Critique" 233).

[141] For Latour it is the social as collective that "produces things and people" as subjects not the other way around: "The Subject does revolve, but not around Nature. It revolves around the collective out of which people and things are generated" (*Never Been Modern* 79). Object are at best co-producers.

[142] The agency of the assembly anticipates relational ontologies discussed in 10.2.4.

[143] This argument might be extended by reference to the hypostatisation of subjects by objects in Theodor Adorno's "Subject and Object" (501). However, as this train of thought is discussed in 10.1 it is not developed further here.

[144] As the act of a subject turning its attention to an object it can be said that "I intend an object" or, to give an example, that a person watching the ball in Serres' game of soccer intends the ball simply by perceiving it.

[145] And in particular the refinements Husserl made in *Ideas Pertaining to a Pure Phenomenology and to Philosophical Phenomenology*.

[146] The ego is fundamentally removed from the act of cognition.

[147] Although phenomenologically grounded, we can see how this speaks to the agency of the quasi-object in Latour and Serres.

[148] There is, then, a certain overlap between Serres' quasi-object and Husserlian intersubjectivity as a specific form of intersubjectivity. In general, we can think about intersubjectivity as being a construct of quasi objects as defined by Serres: "This quasi-object that is a marker of the subject is an astonishing constructer of intersubjectivity" (*Parasite* 227).The key point of difference being the causal agency of intending.

[149] Allowing that intersubjectivity itself becomes an object as a consequence of the meta-subjective subject.

[150] Through Alfred Schutz's reading of Husserl, Hui preempts Heideggarian *Being*. Issues of techno-computational determinism aside, Hui's line of reasoning arrives at essentially the same point being developed here regarding relationality.

[151] Hui derives the idea of milieu from Mathieu Triclot's observation that the term the *technical system* has largely been replaced with *technical milieu* (*Existence* 168).

[152] Simondon defines his term "associated milieu" as an individual's environmental influences (61). However, as Massumi explains, it should also be understood as a "'regime' of energy transfer *between* the technical object and its environment" (28).

[153] Hui points out that while "[m]ilieu and system are two different concepts … the term *technical milieu* has slowly been replaced by the term *technical system*" (*Existence of Digital Objects*

168). Clarifying this further he explains that in comparison with the term "technical system, the milieu is an abstract concept, in which relations are referential, whereas in technical systems, relations and structures are much more concretized" (*Existence of Digital Objects 168)*.

[154] Expanding on this, David Woodruff Smith and Ronald McIntyre explain that there are in fact two different issues with regard to intentionality and representation within Husserlian phenomenology: 'naturalistic' and 'phenomenological' (152). While placing different epistemic emphasis on the act of intending, both treatments affirm the connection between intentionality and representation.

[155] The question of language in Husserlian phenomenology centres on the distinction between its function in 'public' and 'private' structures (*Formal and Transcendental Logic*). Although intersubjectivity is sited between these structures, it assumes a 'private' intention and is thus treated here as transcendent of 'public' language.

[156] All major fields of Phenomenology are ultimately concerned with what becomes present to a knowing subject - thus consciousness is a prerequisite.

[157] See discussion of Serres use of Hermes as a metaphor in 8.5.2.

[158] In the context of Merleau-Ponty's phenomenology it is the 'body' that has agency not language or metaphor.

[159] To be fair, the method of approaching differentiation and representation in isolation at the outset was employed to problematise the term and identify issues of concern rather than resolve the definition.

[160] Note the shift of terminology from discrete to differentiated as defined in 8.3 and reflecting the shift of emphasis.

[161] To do so would risk echoing dualist epistemologies that have proved limiting.

[162] The question of what constitutes a fundamental substance develops from Aristotle who categorises substance in *The Categories* (2000). These might be summarised as consisting of matter, form and a third composite matter/form. This we can equate to being individual and kinds of individuals or, in the terms we have been using, entities and classes. Descartian substance is predictably divided between material substance and mental substance while for Locke the question of *substratum* – the unknown syntax on which qualities subsist, is problematised (Hoffman, 1997). At best the question of substance is perhaps speculative, regardless of realist or idealist claims to knowledge of the world. Hereafter when referring to *substances* in this compound way it will appear in italics. It should otherwise be taken as matter or form.

[163] While affirming this definition J. A. Cover and John O'Leary-Hawthorne's historical analysis of individuation and Joshua Hoffman and Gary Rosenkrantz independence theory of substance, both promote a hierarchy which I elect not to reinforce here as it replicates subject-object dualities already discredited. This is most evident in Hoffman and Rosenkrantz's account where, echoing Aristotle, substances are broken down to levels that contain abstract and concrete categories (*Substance: Its Nature and Existence* 46-48). Cover and O'Leary-Hawthorne include *accident* as one of the three Aristotelean components (*Substance and Individuation in Leibniz*). While, technically speaking, accidents are qualities derived from substances, it is useful to point out that Aristotelian ontology supports an agentic element that is useful here.

[164] The basis of this argument is found in Aristotle's *Categories* in the relationship between substance and individuation (*The Categories* 9). Aristotle states that "All substance appears to signify that which is individual", but goes on to explain that while this is true for "primary substance" in that they are units, but not too for "secondary substance" as these are a class comprised of primary substance (*The Categories* 9-10). However, it is only primary substance that can be individuated: "while remaining numerically one and the same, it is capable of admitting contrary qualities, the modification taking place through a change in the substance itself" (*The Categories* 12).

[165] The use of *qualities* here is very specific and related to philosophical definitions of substance that are addressed in 8.7.1. Of course, *substance* is a term that has specific interpretations in both sculptural and philosophical terms.

[166] Citing James Gleick, Evens proposes that the bit is insubstantial in this way; in fact it is possible to argue that bytes operate in the same way and differ only in their syntactical structure – both can be considered types of substance in an Aristotelian sense.

[167] To be clear here, I am making the distinction between nothing and negative presence, perhaps a sort of set of all-sets in the sense of being inclusive of non-identity. See the discussion of Negative Dialectics 10.1.

[168] Thus it is that Evens attributes the temporal qualities of efficiency, speed, size, reproduction, alteration communication, to the digital (*Logic of the Digital* 8).

[169] See 8.2.

[170] Substance here is inclusive of non-substance but not metaphysical substance. In that non-substance is seen as the absence of substance, it is not other than substance in a metaphysical sense.

[171] Leibniz critiques other contemporary philosophers, namely Géraud de Cordemoy and Pierre Gassendi, but is also dismissive of ancient Greek thinkers such as Epicurus.

[172] See Appendix 5 "I'm the only one who got it right". A transcript of the text from this artwork is provided in Subappendix 1. In it as part of discussing philosophical constructs of knowledge, the *principle of sufficient reason is addressed.*

[173] See *The Controversy Between Leibniz and Clarke, 1715-16* (Leibniz, *Philosophical Paper and Letters* 679-718). In particular, Leibniz's Fourth Letter: "There is no such thing as two individuals indiscernible from each other" (Loemker 687).

[174] The term "active force" is taken from Borelli Diodato who, ignoring the issue of how Leibniz sees *divine* transcendence, reads monads in positive terms stating that the distinction lies not in deferral to another essence but in internalisation of the "active force" which monads represent (Diodato 164).

[175] Kay makes references to the gestural and graphic motivation for OOP throughout his text on *Smalltalk,* but perhaps the most insightful description here is his motivation to amplify the human reach though personal computing (4).

[176] *Elementarerlebnisse* (German) more directly translates as elementary experience, however Carnap defines these as the basic elements (*Logical Structure of the World* 107-109). Erleb is Goodman's abbreviation of *elementarerlebnisse,* which Goodman starts using in *The Structure of Appearance* (112).

[177] For the reason outlined below, there are few clear definitions of erlebs even in Goodman's discussion of them. Gonzalo Rodriguez-Pereyra's definition of them as momentary cross-sections of experience, is taken here as reflecting Goodman's intentions (5).

[178] Although the erleb is the focus of the discussion here, Aufbau is significant because it forms the basis of Goodman's constructional systems in both *A Study of Qualities* and *The Structure of Appearance*. Thus, the syntactic structures that form the basis of Goodman's core concepts should be read in context of the constructional system that is set out in Aufbau. This is not to say that Carnap's base substance is the same as Goodman's erleb.

[179] Certain problematic correlational assumptions are made here, however these will be addressed in Appendix 10. Concrete entities, of course, cannot be said to be atomic elements from a realist perspective. In its construction, the erleb bears some comparison to the construct of eidos – or "essence". But perhaps – despite having a tripartite configuration – it is more comparable to Graham Harman's sensual/real object construct of the quadruple object (*The Quadruple Object*).

[180] The overlapping elements are strictly speaking not quail, concrete entity and experience but the qualitative attributes which Goodman defines as being time, place and colour (*Structure of Appearance* 135 -139).

[181] This is why Goodman is concerned with questions of representation.

[182] See 8.3 and 8.4.

[183] As a point of clarification, however, if we were to define the difference between Goodman and Leibniz regarding time, this would be drawn down reductionist lines. Even though Goodman's argument is phenomenally based he is not a reductionist, whereas Leibniz is considered to be a reductionist by virtue of the way object and event define time.

[184] See 8.2

[185] Goodman's erlebs require no transcendent agency to make themselves active in the world. They are able to do this because – as explained in detail in the *Calculus of Individuals* – erlebs are isomorphic, meaning that different concrete entities are not required to have syntactical symmetry in order that their quail can be perceived. As they extend or project into the world, they inevitably generate multiple worlds which accounts for Goodman's epistemic tolerance. The concepts of isomorphism and projection are developed as extensional isomorphism in *The Structure of Appearance* and address the predicate constructs found in the calculus of classes.

[186] Expanding on this, Goodman goes on to specify platonic syntax as a two-place predicate: "The two-place predicate 'is ancestor of' is, to borrow terminology from the platonistic logic of relations, the (proper) ancestral of the two-place predicate 'is parent of'" (Toward a Constructive Nominalism 109). As such platonic syntax constructs entities that are not differentiated as individuals in the manner prescribed by Goodman.

[187] Here finitude is taken as ontologically committed, whereas subsequently with regard to Quentin Meillassoux, finitude is presented as an epistemic problem. See 10.2.2 for more on this.

[188] Also referred to as the Decidability or Halting Problem (cf. Godel, Hilbert, etc). I will use *undecidability problem* here as this encompasses a broader range of logic propositions including group theory which is of clear relevance here.

[189] Typically expressed in terms of algorithms, Hilbert's Entscheidungsproblem (decision problem) asks if there is an algorithm which, given a set of statements and logic propositions, will decide that the statement is true or false. The Halting problem reinterprets true and false as: will run forever or halt.

[190] See 8.3.1.

[191] There are many ways in which Turing's work might be thought about with regard to this thesis – for example the question of cybernetics that arises from the conception of the mind as a computing machine. However, consideration of such issues is outside the immediate terms of reference of this thesis.

[192] In addition to *On Computable Numbers,* Turing also wrote about the construction of classes and subclasses in *Finite Approximations to Lie Groups*, which, as the title implies, addresses the structures and limitations of defining groups (1938).

[193] Excepting that it isn't run inverse. In which case it is still just running in one direction. It is the direction has changed not the linearity.

[194] That the machine decides might seem like an anthomorphisation, except that we are reminded that Turing initially conceived actions being undertaken manually by computers.

[195] Defined by Turing as the "m-configurations" ("Computable Numbers" 233).

[196] In computer science this "time complexity" equates to the length of time it takes for the algorithm to be completed, and "space complexity" equates to how much memory the algorithm uses.

[197] It is not necessary to develop this distinction further here. However, it is worth thinking back to the motivations and problems behind Kay's *SmallTalk* with regard to "interactive time-shared computers" (1). Rajeev Alur and David Dill's analysis of methods for modelling qualitative time, as opposed to discrete time in automata, also speaks clearly to these issues (*A Theory of Timed Automata*).

[198] Although often referred to collectively, the 'Zeno's arrow paradox', is in fact one of four paradoxes of motion attributed to Zeno of Elea as interpreted by Aristotle. More accurately here I am refereeing to both the paradox of the *Dichotomy* and the *Arrow*. The paradox of *Dichotomy* argues that motion is non-existent and that: "that which is in locomotion must arrive at the half-way stage before it arrives at the goal" (Aristotle *Physics*, 127). The Paradox of the Arrow extends this by arguing that a "flying arrow is at rest, which result follows from the assumption that time is composed of moments", and, "that if everything when it occupies an equal space is at rest, and if that which is in locomotion is always occupying a space at a moment, the flying arrow is therefore motionless" (Aristotle *Physics*, 127; 126).

[199] With regard to Turing's computing machine, 'time complexity' relates to how much the tape moves from square to square. This is equivalent to how long an algorithm takes to run.

[200] With regard to Turing's computing machine, 'space complexity' relates to how many squares are written to. This is equivalent to the amount of storage space required to run an algorithm.

[201] To a large extent, this is what Turing's *computable numbers* are: "The "computable" numbers may be described briefly as the real numbers whose expressions as a decimal are calculable by finite means" ("Computable Numbers" 1).

[202] Bergson is seen here as inverting the quantitate construct of time in which distance determines time.

[203] Although it is not possible to develop this argument in full here, the concept of 'waiting' with regard to the digital was addressed in the Appendix 6 *In Receipt of (Post Screen Not Displayed)*. A transcript of the text from this artwork is provided in Subappendix 2.

[204] Graham Harman is used here because as well as being instructive with regard to Heidegger's work, his own philosophy - Object Oriented Phenomenology, draws heavily on Heidegger. Here and elsewhere in this text – Appendix 10 - Harman is referenced in order to simplify and sometimes polarise arguments rather than promote Object Oriented Phenomenologies agendas.

[205] "The German sein corresponds closely, though not exactly, to the English 'to be'" (Inwood, 2000). "The present infinitive, with or without the neuter definite article, das, occurs as a noun: (das) Sein, 'being'. 'Being' may be the being of something in particular, and then it may be its 'existence' (That-being), or its 'essence' (its What-being or fundamental nature)" (Inwood, 2000).

[206] In this document, being is formatted in different ways to indicate its specific association: being - quotidian use. Being - formal specific use without Philosophical inference. *Being* - referring specifically to Dasein. *Being - in reference to Heidegger without invoking Dasein.*

[207] It is difficult to provide an absolute definition for Dasein as, like many of Heidegger's terms, the nuances of its meaning develop over time. Dasein as I refer to it at the start of this discussion is based not its use in *Being and Time (1927),* whereas later the emphasis shifts to adopt its use post the Freiburg lecture on *The Origins of the Work of Art (1935)* and *Contribution to Philosophy (1936)*.

[208] Anthropocentrism is the starting point for the consideration of correlationist proposition in Chapter 9.

[209] In essence, this is the problem of ontological priority. Gorman articulates this as the ordering of dependence and priority and, associating this with "degrees-of-being, the part-whole relation, the relations between space and matter and between time and motion, the relations between universals and individuals", affirms the connections asserted here (470).

[210] The example of the broken hammer is frequently used to explain Heidegger's neologisms Vorhandenheit - presence-at-hand, and Zuhandenheit - readiness-to-hand (Heidegger, 1962 67-73).
[211] This is not to say that Hui says Heidegger is reactionary. In fact, he acknowledges Heidegger's formal deferral of formal relations to *reference* (Hui 117-118).
[212] Enframing is a mode of revealing, a destining of being (Heidegger, 1977 xxxiv).
[213] The German title of this publication is *Beiträge zur Philosophie (Vom Ereignis*) (Heidegger). Michael Inwood provides a definition of Ereignis: "The most general term for an event is Ereignis, from sich ereignen, 'to happen, occur" but also "becoming/to become visible" (Inwood 54).
[214] In some translations of the lecture on "The Origin of the Work of Art", Beyng is used but it is more clearly embedded in Heidegger's argument in *Contributions to Philosophy*.
[215] Like Latour's critique of scientific certainty, Heidegger's position once again challenges the legitimacy of established modes of knowledge production. This point is explored further in Appendix 9.
[216] "Aletheia is Greek for 'truth; truthfulness, frankness, sincerity'", but also taken in Heidegger as "that which is 'not hidden or forgotten', or he who 'does not hide or forget' (Inwood 13).
[217] For Heidegger this is the "first beginning" (Heidegger 2013).
[218] Heidegger builds his argument of the *Event* from this framework and a large part of *The Contributions to Philosophy* is framed as a critique of metaphysical-logic because the tension between the two is a necessary condition for the emergence of truth - "first beginning" *(Contributions* 93).
[219] While Heidegger explicitly rejects Bergson's conception of time as simply an inversion of the Hegelian thesis that space is time, Massey argues that Heidegger develops his conception of time from Bergson (Heidegger, *Contributions* 39, & Massey).
[220] "Bergson's view is in accord with Hegel's thesis that space 'is' time. Bergson merely says the reverse: that time (temps) is space. Bergson's view of time, too, has obviously arisen from an Interpretation of the Aristotelian essay on time. […] Bergson prefaces his analysis of time with an analysis of *number*. Time as space (Cf. *Essai* p. 69) is quantitive succession" (Heidegger, *Being and Time* 500).
[221] Massey appears to take this from *The Contributions to Philosophy,* in which it appears as "the subjectivity of the subject" *(354)* In this he is referring to the Kant inheritance of the Descartian connection between time and ' I think'. This is not developed here as it speaks more to the correlational issues addressed in Chapter 9.
[222] Something that Heidegger deliberately and consistently does as part of his agenda to redress metaphysics.
[223] Ontological priority is the subject of section 3-4 of the Introduction in *Being and Time*. Any revision of this after 'the turn' is towards a simultaneity of Being and object in the *Event,* but the *Event* is always dependent on Dasein and objects are always partly withdrawn.
[224] This is not to imply that *Beyng* provides a full solution to the questions inherent in the inception of differentiated representation. Rather, *Beyng* redirects the question of digital ontology to practice and sets the stage for the discussion of method in Appendix 9.
[225] Heidegger uses the term *twisting free* to describe the overcoming of metaphysics "in the realm of the history of being" (*Contributions to Philosophy* 92).
[226] As argued, temporality for Heidegger is not vested in ontology but in Beyng in-itself (*Being and Time* 18-19).
[227] See 8.5.1
[228] The description of the gigantism of technology as the threat to instinct that Heidegger makes in *The Contributions to Philosophy* is a precursor to his critique of technology that appears later in T*he Question Concerning Technology* (1953) (Heidegger, *Contributions to Philosophy* 142). Gigantism is clearly aligned with his broader critique of metaphysics. David Berry explicitly extends Heidegger's argument to digital technology explaining that "the gigantic is understood as the very possibility of quality being derivational from quantity itself" (Berry, 201).
[229] As a student of Husserl's, Heidegger's early work was indebted to him. It was not until the 1929 Freiburg lecture "What is Metaphysics" that he started to clearly distance himself from phenomenology (Sheehan).
[230] He defines the 'pure' in art as art that is without symbols. Although this counterfactual argument is specifically related to abstract painting, it can be taken as referring to contemporary art concerned with its own subjectivity.
[231] Although sharing some things in common with Ernest Gombrich's 'narrative', Goodman's world-version pluralism clearly distinguishes the two. While Gombrich's *schemata* are progressive constructs that bear some comparison to Goodman's habitual projections, Goodman's 'worlds' are more dynamic in their generation and discovery (Goodman, *Worldmaking* 7-22; Gombrich 33-73).
[232] Both conceptual art and found objects are identified as cases that question a symbolic approach to art.

[233] In *The Languages of Art*, Goodman briefly addresses sculpture, determining that the basic arguments he makes are as "conclusive for sculpture as well as for painting" (19-20).
[234] See 8.5.1.
[235] Unlike the examples of representational paintings, Goodman never directly references abstract artists. However, his description of them corresponds with paintings by Frank Stella and Sol LeWitt of that same period.
[236] This is made clear by Goodman in the *Language of Art* where the concepts of "denotation" and "exemplification" are used more broadly and serve to connect the function of predicates with the question of individuation, differentiation and the digital (*Languages of Art* 3-6 & 52-56).

[237] "But these *a priori* sources of cognition determine their own boundaries by the very fact (that they are merely conditions of sensibility), namely that they apply to objects only so far as they are considered as appearances but do not present things in themselves" (Kant, *The Cambridge Edition*, A39, 183). This alignment with Kant regarding the accessibility of things-in-themselves confusingly aligns Goodman with aspects of transcendental idealism. It is however more reflective of his position to continue to think of him as an irrealist or anti-realist.
[238] In both *The Language of Art* and *Ways of Worldmaking*, Goodman uses the term *practice* in a number of different ways: In some instances, it means actually as opposed to theoretically, while in others it defines a method of worldmaking. While it is never used in reference to artistic practice, neither is this excluded as process that is practiced. I take the later use of the term here and interpret it as the method that determines when art is. The significance of articulating practice as a temporal and spatial ontology is that it anticipates the fundamental nature of erlebs or quail as the fundamental atomic unit. See 8.8.
[239] See "When is Art" (Goodman, *Ways of Worldmaking* 57-70).
[240] Despite the obviously association between Goodman's *show forth* and Heidegger' *bringing forth*, there appears not to have been any philosophical work done with regard to the two. This is perhaps because *show forth* is a relatively undeveloped aspect Goodman's work. While further in depth analysis of this appears connection appears to be warranted, this lies outside the scope of this thesis.
[241] It is not without significance that it is in this Chapter on *The Theory of Notation*, that the definition of the digital taken by D. Lewis is found.
[242] See Appendix 6 *Post Screen Not Displayed*. A transcript of the text from this artwork is provided in Subappendix 2.
[243] Blades cites Andre Lepecki's Redoing *18 Happenings in 6 Parts,* 2007, as an example; however this is one of several subsequent reenactments. Lepecki cites Kaprow as having written, "Each of these parts may be re-arranged indefinitely", but no citations are given. With regard to Goodman's theory of notation this point can also be taken as applying to various re-enactments of Jim Allen's work as discussed in Appendix 9.
[244] Being otherwise would contradict basic axioms which assume that a thing is equal to itself. The Law of Identity, one of three classical axioms, asserts that an object is the same as itself: A=A.
[245] This follows an isomorphic construct that is addressed by Goodman's extensional isomorphism which is set out in the *Calculus of Individuals*. Although not addressed here, it allows for the overlap of subjects as a solution to the calculus of classes.
[246] This is why the phrase 'differentiated representation' creates a metaontological paradox.
[247] Taylor's account here is very concise and maps an epistemic shift or turn from Platonic fundamentals though phenomenology to Heideggerian *dasein*. While it is not possible to follow that chronology here, it significantly positions representational philosophy within that lineage.

Appendix 9 **What Does Practice Want?**

9.1 **Digital Practices**

The dim 16mm footage of *Earthworks* begrudgingly reveals damp, unidentified figures gathered on a bleak tundra, seemingly sharing pieces of paper or occasionally glancing up at the sky[1] (Dadson, *Earthworks*). However, it tells us very little about why this work initiated by Phil Dadson in 1971 is the earliest cited artwork on the Aotearoa[2] *Digital Arts Network* database (ADA). In contrast, the luminous x-ray-like abstraction emerging from the black ground of Ben Laposky's *Oscillons,*[3] seems to justify its position as the earliest example of digital art on the Digital Art Museum's timeline[4] (DAM). Conforming to everything we expect digital art to be, Ben Laposky's status as a pioneer of digital art thus seems assured.

But to what extent are these underlying assumptions justified, when both Dadson's *Earthworks* and Laposky's *Oscillons* were generated on analog equipment? Clearly neither involved what we would today consider to be digital technologies. It is easy to resolve this by explaining that while these works did not directly involve 'digital' processes as such, in context they mark significant contributions to the development of computer art and thus, under established definitions, make some claim to 'being digital'. Indeed, in the case of Laposky, this is the point made by computer art theorist Mike King when he notes the influence of Laposky's work on the development of computer art ("Computers and Modern Art"). Again, as with Evens, we see a slippage between terms, and the further conflation of the digital with the computational.[5] Here, however, it is not my aim to quibble over the semantics of taxonomy, but to understand how the evidently analog practices of a mathematician and a Post-object artist can inform our understanding of *the digital* beyond the techno-computational.

Dadson's *Earthworks* has been singled out here not simply because of its chronological primacy on the ADA website. As a figure central to Post-object Art, Dadson brings into consideration a broader range of practices,

including my own, that extend "sculpture into temporary, multi-part, mixed-media, largely ephemeral situations" (Barton, "Post Object and Conceptual Art"). While elsewhere such practices might have been referred to as post-minimal, conceptual or arte povera in New Zealand the term Post-object Art was generally adopted (Barton, ARTSPACE). Post-object Art practices should thus be understood as part of a continuum of practices that extend beyond the dialectics of medium as framed earlier in regard to the 'post-media' aesthetics of Krauss's "expanded field",[6] in that they give "permission to think […] other forms of practice", in which "sculpture is no longer the privileged middle term between two things that it isn't" (*Sculpture in the Expanded Field*, 38). What might then be more appropriately referred to as Post-object Sculpture, prepares the ground for thinking a practice which is radically open to the possibility of being what it is not.[7]

Earthworks itself is described by Dadson as a "simultaneous, ten-minute performance and recording event – coinciding with the spring and autumn equinoxes" at fifteen globally distributed locations (*Earthworks*). The participants were invited to perform instructions for taking photographs, making film and audio recordings or reporting local conditions for ten minutes. The video of this film is a direct copy of the 16mm footage later edited by Dadson to include still images and the unedited audio recordings of the event.

Similarly, Laposky's *Oscillons,* which he continued to produce and exhibit until 1966, have been selected here not just because of their location on the DAM timeline which acclaims Laposky as a pioneer of digital art, but because in combination with their analog mode of production, the citation of these works as digital draws into consideration the criteria we use to define other so-called 'digital art' practices. Generated on modified analog oscilloscopes, Laposky's *Oscillons,* of which there are reportedly thousands, are in fact photographs of manually controlled electronic waveforms displayed on the phosphorescent surface of a

cathode ray tube. While Laposky's work is singled out here, he should be taken as representative of a number of artist/mathematicians[8] working around the same period with what Laposky termed *Electronic Abstractions*.

That Dadson's and Laposky's works continue to be used to define, or to be defined as, digital art not only speaks to an ongoing confusion surrounding the term 'digital' but, more importantly, serves to highlight a crucial point of intersection at which two quite distinct art practices are retrospectively seen to be making a claim to the term. It is perhaps at the intersection of Post-object Art and Electronic Abstractions that we can identify something further about the ontological nature of the digital in art practice.

9.1.1 **Oscillating Narratives**

In order to consider these issues it is first necessary to reconsider 'digital art' narratives, such as those put forward by King, that are based on formalist values entrenched in media-art histories[9] ("Computers and Modern Art"). Such narratives, claims King, paraphrasing Maurice Tuchman, have "failed to probe beneath the aesthetic and formalist structure" of abstract art, and have thus contributed to a formalist reading of computer art which – as acknowledged by Norbert Lynton – is in most cases a fabrication (King, "Computers and Modern Art"; Lynton, 10). Unfortunately, this sort of Greenbergian formalism is still evident in organisations such as DAM and CHArt (Computers in the History of Art), and seems to perpetuate formalist Media Art narratives.[10] Despite acknowledging the limitations of such an approach, King seems unable to move beyond a formalist reading of digital art and continues to promote a historical account in which the computer plays only a "marginal role in the kind of art that now dominates the fine art world" ("Computers and Modern Art").

This particular formalist lens has tended to limit the reading of Laposky's *Oscillons*. Even more analytically open accounts of computer art, such as Michael Schwab's *Early Computer Art and the Meaning of Information*, to some extent perpetuate this narrow reading by making further formal comparison between Op Art and Algorithmic Art.[11] While Schwab risks being drawn into this formalist dialogue through such comparisons, he clearly has a different agenda – one which at first seems to move away from entrenched New-Media narratives towards an informational approach that re-narrates computer art as being fundamentally more concerned with its inherent information structures than with its aesthetic value ("Early Computer Art"). Thus, in the context of the dematerialised art practices, Schwab points to an alternate reading of computer art that is so informationally focused that it fails to see or even need the computer screen. Instead the viewer is asked to look beyond the defining requisite of the screen to the active composition of the algorithm as idea. In this narrative, consideration then shifts away from the aesthetics of the image to the structures of the algorithms that generated them. Thus, rather than consider Laposky's *Oscillons* as part of a formalist account which seeks to locate computer art in relation to modernist abstraction – as Laposky himself does in calling them *Electronic Abstractions* – it should be possible to *see* past the abstract images to the structures that generate them. In doing so, we can perhaps gain an alternative understanding of how we might understand them as digital art.

In literal terms this task is hindered by the fact that what remains of Laposky's artwork is largely in the form of photographs, and while there are images of his equipment, there appears to be no record of the oscilloscope control settings that he used (Drain).[12] In this case it is pretty difficult to 'see past' Laposky's images. However, this is of little consequence as the point I am trying to make is that Laposky's status as a pioneer of digital art has been made on the basis of formalist

comparisons[13]. There are alternatives to this prescriptive interpretation that, following Schwab's informationally focused reading of computer art, question Laposky's status as a digital artist. If we can justifiably contest our understanding of what constitutes computer art, then by association the definition of digital art is liberated from computational determinism computationally determined interpretation. It is important, then, to understand in more detail the basis for Schwab's argument.

9.1.2 **Information Events**

Schwab develops his argument for an informational approach to art following a line of reasoning in which information is identified with randomness and is treated as dependent on, yet distinct from, meaning. This is achieved by virtue of a correlate equation in which the sum of everything equals 100%.[14] In other words, an artwork is the sum of information and meaning which must always equal the whole. Although Schwab's argument is rather confusingly expressed, he is in essence promoting an algorithmic ontology in which that which a thing is, is inseparable from that which it is not.[15] Information and meaning, subject and object, something and nothing, 1 and 0, are proportionally contingent on each other to the sum of the whole.[16]

The key point here, though, is Schwab's suggestion that, in computer art, information is dependent on randomness. This, he says, should be taken as indicative of a "break [up] from traditional concepts of meaning" and has the effect of holding meaning as separate from information ("Early Computer Art" 37). Such a reframing of computer art thus redefines the role of the artist as a selector of information, rather than the creator of information. The artist's role is presented as being akin to that of the algorithm in that the artist performs the function of ordering the information from which meaning is derived. As such, Schwab's

informational analysis is a clear departure from the type of formalist 'new media' narratives through which the *Oscillons* are defined as digital, and a move towards a reading of art in which systems themselves become aesthetic criteria.

Of course Schwab is not the only person making such arguments.[17] Indeed he is perhaps a little less radical than others like Florian Cramer, who suggests that the history of computer art is a "history of ignorance against programming and programmers", one in which digital art is complicit when it refers to itself as "[new] 'media art'" ("Concepts, Notations, Software, Art"). The term 'media art', then, is typically in opposition to Schwab's argument as it locates meaning as being something inherent in and particular to the media. Cramer echoes Schwab's critique by asserting that digital art histories such as King's privilege "aisthesis (perception) over poiesis (construction)" ("Computers and Modern Art"). As such we can see that both Cramer and Schwab promote an ontology of digital art that is based on a *becoming* rather than a *being;* in a manner reminiscent of Heidegger's *Dasein,* it shifts ontology from a *what* to a *how.*[18] For Schwab, digital art seems to be defined by processes that organise information, and for Cramer in the execution of notation. Both speak to the executability of algorithms – a form of instruction – as the defining characteristic of computer art.

It is clear from Cramer, however, that such a notion of execution is not so much a physical process as it is a mental one. Thus Cramer cites Hugo Ball's Dada poem *Karawane (1916)*, as a form of notational software ("Concepts, Notations, Software"), one that might be capable of contesting Laposky's status as a pioneer of digital art. Any such claim would shift the context for digital art away from formalist comparisons and align digital art with Joseph Kosuth's construct of 'art as idea as idea'.[19] Such constructs emphasise execution over artefact in the sense that they are seen as "an idea or mental plan of the way to do something" (Curley 128). Although neither Cramer or Schwab make such

a direct connection with Kosuth's work, their intention to shift the contextual framework for digital art to the *dematerialised*[20] conceptual art practices of the 1960-70s is made clear through reference to Jack Burnham's exhibition *Software* (1970) – an exhibition Schwab sees as a "brief time when Conceptual Art met Information Technology", and Cramer identifies as being responsible for addressing the question of how contemporary art relates to software (Schwab, "Early Computer Art"; Cramer, "Concepts, Notations, Software").

Although it is in fact doubtful that *Software* was the first exhibition of conceptual art as claimed by Cramer,[21] the exhibition is significant in that it served to articulate Burnham's concepts on *systems aesthetics* in an exhibition format. However, the exhibition seems less instructive here than the essays Burnham published prior to the exhibition itself.[22] Whereas in the exhibition Burnham's ideas on systems thinking are mediated by the work and interests of other artists, in key papers such as "Systems Aesthetics", he lays out his core proposition directly. While other essays emphasise different aspects of his thesis, "Systems Aesthetics" is the text that most specifically addresses the issues we are directly concerned with here,[23] namely, the viability of an alternate computer art narrative that might inform the ontological nature of the digital. In fact, some of the points made in "Systems Aesthetics" not only inform the nature of *the digital* itself but further highlight connections with other contemporary art practices and concerns, thus adding to the alternative narratives proposed by Schwab and Cramer. It is worth side-tracking for a moment, then, to make these connections.

9.1.3 **Systems Thinking**

While on one hand you can take Burnham's systems thinking simply as a "raid on the Fried/Greenberg camp of art criticism", this would fail to recognise the alternative proposition that it presents (Ragain, *Dissolve*

into Comprehension xviii).[24] For while Burnham undoubtedly rejected formalist and object-based art on Marxist grounds, he also attempted to replace its value as 'commodity fetish' with a procedural value: "We are now in transition from an *object-oriented* to a *systems-oriented* culture. One in which change emanates not from *things*, but from the *way things are done*" ("Systems Aesthetics" 31). While we might nostalgically lament the failure of Burnham's prediction in the face of a commodity-driven art market which has managed to repackage *dematerialised* practices as consumable product, the proposition Burnham presents is still instructive. It not only substantiates Schwab and Cramer's alternative narratives by establishing concrete connections to conceptual art practices, but also serves to inform the emerging ontological proposition of this thesis.

While Burnham's articulation of *systems aesthetics* as being fundamentally concerned with the "problem of boundary concepts" aligns with his anti-formalist position, this seems to be an overly simplistic summary of his thinking ("Systems Aesthetics" 32). One can understand how the *boundary concept* is a convenient term for Burnham because of the way it speaks against a formalist framing; however, system thinking also aims to propose an alternative to such materially defined boundaries in the form of concept-driven situations. Boundaries are thus configured not by media but by the artist, whose role is to prepare the 'code'.[25] It is these instructions – or code – that define the routines and structures that process input and output, resulting in what Burnham refers to as "self-metaprograms" ("Real Time Systems" 49). Burnham derives the term self-*metaprograms* from John Lilly who uses *metaprogram* in regard to bio-computing to describe the process of learning to learn that allows parallel processing (6).[26] While Lilly's use of the term focuses more on the metaprogram's conscious awareness of and role in mediating reality, Burnham intends not only that the instructions and descriptions of specific work be seen as a form of command structures, but that the meta-infrastructures of the art world to be seen as part of the encoding of the material with which the artist works.[27]

While Burnham's co-option of computational terminology in this way clearly supports Cramer and Schwab's rewriting of the media-arts narrative represented by King, as exemplified by the use of the term self-metaprograms, systems thinking itself does more than simply argue for a dematerialised-object as a form of *performed*-object. As indicated through the emphasis he places on minimalist artists,[28] Burnham is never truly anti-object in a way that allows him to be totally comfortable with happenings or performance art. Rather, objects are seen as performative because of their own implicit phenomenal subjectivity (Burnham in Lee, 102). Thus a fuller understanding of the *boundary concept* of systems thinking is one of metaprograming in which the invisibility of process takes precedence over the visibility of product, each remaining temporally interdependent in the self-presencing event. This is not the enactment of a method-as-art, but art as an object that is in perpetual meta-dynamics with the context of its production. It is art as an object that is only ever practised in a phenomenological sense. While the exhibition *Software* utilised communications technology, it concentrated on the *invisible* transactional ecologies of Conceptual Art practices (Burnham, "Notes on Art") and defines computer art on the basis of procedural systems rather than formal aesthetics.

So now when we return to a consideration of Laposky's *Oscillons*, it is even harder to give credence to their status as digital art. Even if we try to see past the aesthetics of the image, there is little about them that satisfies Burnham's systems thinking. They seem to actively obscure any reading of themselves as a dynamic self-presencing event.[29] Revealed as essentially formalist, King's historical positioning of them only obscures their true nature. Not only are they analog in their mechanical mode of production, but they are digital only via comparative Greenbergian associations which retroactively attribute status to them by noting their resemblance to subsequent digitally generated computer images. Only

through adherence to such retroactive formalist doctrine can institutes such as DAM continue to declare Laposky as a pioneer of Digital Art.

9.1.4 **Post-object Practice**

In as much as 'Post-object Art' can be aligned with Conceptual Art practices, Dadson's work is typically more closely aligned with Burnham's systems thinking than Laposky's *Oscillons*. Dadson is also clearly less interested in the sort of media-driven and formalist arguments put forward by King and certainly, the type of formalist comparisons that Schwab makes are of little relevance with regards to his work. However, it is relatively easy to see how the systemic structures employed in *Earthworks* fit within the framework of Burnham's systems theory. Indeed, because of the fractured nature of the communication between its globally distributed sites, *Earthworks* seems to be nothing but a system or structure for organising discrete elements. Through its strained and often disrupted connections it draws our attention to the tangibility of its pre-internet network structure. The dank obscurity of the moving image in which it is difficult to discern content, and the overlaid utterances of participants, make it hard to follow any cohesive narrative. Indeed, conversation seems to wilfully ignore content, much like information disregarding data – the landscape as subject might as easily be an *Oscillon,* and the soundtrack network noise. The 'object' that is this image seems to have no value, or at least no value in the formalist sense. Rather, value lies not in the parts but in the relations between them, which – if we follow *systems aesthetics* – is formed by the structures defined by the artist. As a form of metaprogram, the work is driven by an internal logic: it is an object that "takes action on its own internal states" (Floridi, "What Is the Philosophy of Information?" 166). Yet it also reaches beyond its immediate-self to include geo-temporal juxtapositions in its schema – to the tensions between the discrete geographical locations and their temporal unity, conceived of through both the empirical and

universal constant of time. As a structure that we can conceive of but never perceive, the geo-temporal event of the equinox becomes an object in perpetual meta-dynamic with the context of its production, one that perhaps even approaches the consciousness of a self-metaprogram: a form of self-becoming that approaches auto-poiesis (Burnham, "Real Time Systems" 49).

Dadson articulates this in the opening credits of *Earthworks* as an engagement with "a temporal instant in the continuum of universal ebb and flow" ("Earthworks"). Indeed, such metaphysical dualities provide the abstract structural motivation for much of Dadson's work. As Lance Pearce recognises in his review of Dadson's 2014 exhibition *Parallel Harmonies*, the drive to find meaningful ways of inhabiting both our bodies and the world, of being able to mediate between the relations within a work and the relations between works, is the structural motivation behind Dadson's practice (Pearce). Dadson, then, already seems to meet Burnham halfway by abstracting his thinking to a structural level. The work simply becomes a relational structure for executing concept-events within.

Such structural thinking has underpinned much of Dadson's work including the sonic work of *From Scratch* – the experimental sonic performance group Dadson derived from Cornelius Cardew's *Scratch Orchestra*.[30] Indeed, performances such as *Gung Ho 1,2,3D (8,9,10)*, (1980), make this explicit by literally drawing a structural abstraction of the work's triadic structure on the floor in chalk at the start of the performance ("From Scratch"). While such abstractions provide a framework within which the work is performed, they do not fully define the work. Rather, they function as a set of parameters within which the performers sonically and spatially improvise. For both Dadson and Cardew, then, such improvisation is not understood as 'an anything goes free-for-all', but as a carefully scripted event that defines a field of action within which variable autonomy is executed. While John Cage's

influence should not be overlooked here, Cardew and Dadson are clearly more committed to the notion of improvisation.[31] Cage, on the other hand, sought an *indeterminacy* that would eliminate aestheticised and responsive performative acts and allow for a greater degree of autonomy for the performer (McMullen). Thus the sort of visual notation evident in Cardew's *Treatise* is echoed in Dadson's *Feburary Music,* 2015, in which a month-long series of daily drawings operate as a score for a sonic performance by the *Equinox Collective* (Hurrell). Here, although the drawings remain on exhibition for the duration of the exhibition, they become "invisible" – we see past them as the metaprogram of Dadson's structural practice, to the self-metaprogram of the improvised performance. Improvised actions insert themselves into the score as data input into a system in the same way that Schwab describes the relationship between the algorithm and information as working. While the artist defines the algorithmic rules of the work, it is the variability of the improvisational data input that produces the work ("Early Computer Art" 17). It is not that the quality of the improvisation is unimportant; rather, that the resulting work is the product of a structural concept within which improvisational processes function.

While we will follow Schwab briefly again here, it is important to acknowledge the difference and similarities between the agency of information as presented by Schwab and Floridi's *information philosophy*.[32] While both draw on Claude Shannon's work regarding 'information theory', for Schwab the agency of information within a structure defines meaning and is coupled, even compounded, with it. For Floridi on the other hand, information becomes its own material and is increasingly less reliant on the physical world as information itself becomes substance and *re-ontologises* the structures that it operates within ("Information" 11-17).[33] For this to happen information must be "decoupled from its support" – data (Floridi, "Information" 24). Within the *info-sphere,* subject/object distinctions are negated and information

becomes more akin to Cage's *indeterminacy* which, as already noted, is less insightful with regards to Dadson's work and systems thinking.[34]

Thus, returning to Schwab's argument regarding the correlate between information and randomness[35], we should also understand improvisation as an entropic potential – as a set of possible responses within a meaning-making system that inherently produces redundancy through order ("Early Computer Art" 31).[36] Given room for improvisation within an ordered system, a performer has an excess of information – of choices – that necessarily results in redundant data – the actions they don't take. Contradictory to logic, Schwab suggests that it is the disorder of these redundant elements that represents the structure of the work, rather than the other way around. It is through this reversal of hierarchy that our attention shifts from the artefact resulting from a process, to the execution of process itself – away from the *product* of knowledge to the *production* of knowledge.[37] This break from the established economies of meaning-making that Schwab suggests, clearly aligns conceptual art practices such as those included in Burnham's exhibition *Software* with the algorithmic principle of computer art.

Indeed, Post-object art practices such as Dadson's can, as the term suggests, generally be treated as embodying these principles. The material object becomes secondary, giving way to what we might term the post-object object – a set of 'instructions' that focus attention on the information, or metaprogram. Rather confusingly, what appears to come 'post' the object is not *after* at all. As will be argued later, it is in fact a return to the temporal structures within which the *object* itself is brought forth or executed.

Given this apparent contradiction, it is not surprising that Burnham tested out the term post-object in a lecture at the Guggenheim Museum, New York in 1967. While Donald Karsha's *The Seventies: Post-object Art,* which appeared in Studio International in September 1970, is typically cited as

the first printed use of the term, Burnham's lecture preceded this by nearly three years and should, I suggest, be taken as the first documented use of the term.

Even though it is now impossible to establish a direct connection between Burnham and New Zealand Post-object art, I want to suggest that the term was not simply "in the air" as suggested by Jim Allen ("Personal Interview").[38] Rather, I propose the term arrived in New Zealand already fully formed as a direct result of a tour made by Allen through the UK and US in 1968 – some eleven months after Burnham's Guggenheim lecture. While Allen apparently did not meet Burnham until 1980, it must have been pure happenstance that the two did not meet when Allen visited both MIT, Centre of Advanced Visual Studies and Yale School of Art where he met Adrian Hall – another artist subsequently associated with Post-object Art. While Burnham was by this stage lecturing at Northwestern University, he had completed his MFA at Yale in 1961 and was a Fellow at MIT in 1968-9 (Ragain, "Dissolve into Comprehension" 281-296). Hall, on the other hand, who Allen established an ongoing connection with and eventually brought to New Zealand as an artist-in-residence (1971-72), had moved to Yale in 1968 to commence study at Yale School of Art (Allen, "Skin of Years" 101-105). It seems likely then that if Hall did not actually attend Burnham's Guggenheim lecture, he would have at least been familiar with the term.

In fact, we know that both Allen and Burnham saw the work by Pulsa Group at Yale University School of Art and Architecture. Burnham, who had been following the group's activities during 1968 -1969, cites Pulsa's *Untitled* (1969) – the light-sound installation at the Yale Golf Course – as one of the "most ambitious programmed art environments to date" (Ragain, "Dissolve into Comprehension" 135 & 145). No doubt Burnham's own sculptural work with electroluminescent tape[39] in the same year would also have been known to the Pulsa Group. Allen also makes direct

reference to Pulsa in his biography as being "the first time [I] had seen computer-controlled environment, of any kind…" ("The Skin of Years" 105). In addition to this, Adrian Hall was a student at the Yale School of Art and Architecture at the time of Allen's visit, would have undoubtedly have known of the project and was probably responsible for introducing Allen to the group.[40] As a student at Yale, Hall would have at the very least been aware of Burnham's work, and given the "two-way traffic" between Yale and New York (Allen, "The Skin of Years" 103), the nature of Hall's own work and Burnham's upcoming lecture on *Artificial Intelligence* at Yale on 11 November 1968, it is credible that at the very least he introduced Allen to Burnham's ideas. If Burnham and Post-object Art were simply 'in the air' as Allen suggests, then the air was very dank and close indeed.

This is not to suggest that Allen was solely responsible for bringing Post-object Art to New Zealand. Indeed, Post-object Art was clearly influenced by mediated exposure to American practices and a steady flow of artists and ideas from the UK (Barton, "Post-object and Conceptual Art"). However, contrary to the vague comparisons between Post-object Art, Post Minimalism, Conceptualism and Arte Provera offered by recent revisionist accounts, I suggest that we should see Allen's 1968 trip and likely exposure to Burnham's thinking as marking the start of Post-object Art in New Zealand.

Regardless of the details of this argument and whether or not anyone used the term 'Post-object' to Allen, or if he and Burnham actually "made contact", the fact is that Allen was profoundly influenced by what he experienced during his 1968 trip and his work radically changed to reflect concerns that we now understand as Post-object Art. If we extend the discussion a moment longer to consider Allen's work following his return to New Zealand, the influence is clear. Initially presented in 1974 and reenacted in 2011, *Computer Dance* is one section of the three-part work *Contact*. The other two parts – *Parangole Capes* and

Body Articulation will not be discussed here, as the point can be clearly made without reference to them.[41] At the very outset, however – before we even engage with this work – we are asked to confront this three-part structure, a structure which itself seems to operate as a self-metaprogram[42] by allowing variations in format.[43] Regardless of these variations, the meta-structure of the work forces us into a reflective space outside the work in order to conceive of it. We must remain both present in the part we are observing, and cognizant of the structural relation to the whole, in order to perceive it. Within each section of the work we again find similar meta levels of information. Unlike Dadson or Cardew's scores, Allen's verbal instructions for the work provide only the most elementary relational information. Certainly they do not even approach the level of instruction evident in Kaprow's *18 Happenings in 6 Parts* (1959), where even the audience is scripted to move at key stages of the work. The instructions amount to no more than a guide for the task the performers are undertaking. In the case of the 2011 reenactment of *Computer Dance*, this consisted of telling blindfolded performers with paired IR emitter and receivers to 'connect' with each other while being subjected to acoustic and tactile disturbance.[44] This was, I suspect, more than was given the 1974 performers, who simply showed up on the day and performed unrehearsed. Allen's preference for the improvisational tension that such minimal information creates is clearly consistent with Schwab's understanding of entropic potential, which focuses on the immediacy of relational processes within the work. As Tina Barton in her seminal thesis on Post-object Art explains:

> The anti-representational impulse distinguishable in much post-object art of the 1970s was the significant by-product of the contemporary investigation of real-time and real space, which was attendant upon a shift in emphasis from object to situation, from product to process, from art to art information.[45] ("Post-object Art" 121)

Thus in Post-object Art the function of instruction is to provide a structure for the 'real' (improvised) processes of the work, as the work, in a manner consistent with the entropic function of information (randomness) in Schwab's analysis of early computer art. In both cases the structural framework within which entropic processes are executed, are themselves definitive of the work. While the practice of execution itself becomes the work, rather than the output resulting from that process, it is never completely 'decoupled' from the object in Post-object Art. The practice that is 'post' must be taken as inclusive of the object. As Schwab concludes in Post-object [conceptual] Art, "information itself forms the centre of attention" and the role of the "artists is comparable to a programmer" ("Early Computer Art" 40-41).

While both Barton and Schwab identify the semantic function of information processing as central to both Post-object Art and computer art practices, it is Burnham's self-metaprogram that most clearly connects the two and also helps explain the confusion around the classification of Dadson's *Earthworks* as a digital artwork. As an object that arises out of its own condition of being, *Earthworks* might be taken as exemplifying Post-object Art practice. The artist, functioning as a programmer for the entropic information fed to him over the network, provides a structure for making meaning out of the data provided. While this might allow us to understand the work in computational terms, it does not necessarily satisfy a reading of it as a digital artwork. This, I have suggested, is achieved through the specific nature of the structures the work itself uses for organising discrete elements in time and space – structures that require we look *beyond* the object that is the work, to the post-object that is the self-meta-framework that constitutes its formal ontology.

9.2 **Post Objects**

Looking beyond an object is not the same as looking at what comes after or indeed before it. In this sense the term '*post',* as in Post-object, is perhaps confusing given that '*post'* here typically denotes a "disavowal of the object", or rejection of a causal relation to that which follows (Ragain, "Dissolve into Comprehension" xxvii).[46] Such linear temporality is clearly not what Burnham means by metaprograming, nor is it consistent with Post-object Art's commitment to the immediacy of the 'real' (Burke in Barton "ARTSPACE" 4). How then should we understand the '*post',* and how might this inform our understanding of digital art practice? To respond to this question I want to focus on what seems to be an underdeveloped aspect of Burnham's work in order to frame a reading of the problem term, and thus develop a fuller understanding of the functioning of self-meta-frameworks that inform our reading of the digital.

While explaining the function of processing structures and information in art, Burnham employs the term *negentropy* to describe the entropy-reducing potential of a system ("Real Time Systems" 50). Although Burnham cites no source and does not elaborate on his understanding of this term, it seems to be an adoption of Erwin Schrodinger's term 'negative entropy' in *What is Life* (1967). While Burnham is intent on developing a reading of art objects as real-time information systems, and Schrodinger is focused on reconciling how spatial and temporal events operate within the boundaries of a living organism,[47] both are concerned with how relative states of order and disorder are maintained between a system and its context.[48] Thus, as noted earlier by Schwab citing Claude Shannon, entropic potential becomes a core concept in defining ontology as it governs relational differentiation: that which distinguishes one thing from another. While a fuller analysis of Shannon's entropy as it relates to information theory may be instructive, it is sufficient here to frame entropy as a measure

of unpredictability within a system.[49] For Schrodinger, maximum entropy is a state of equilibrium in which no data is exchanged between subject and environment; and for Burnham the same concept is conversely expressed as the potential of data to reduce the entropy of a system – termed *negative entropy*. In both cases, maximum entropy is the point at which no observable events occur and the "system fades away into a dead, inert lump of matter" (Schrodinger, "What is Life" 24). Thus, a reciprocal dynamic relationship between data in the world and information 'in' the system is central to maintaining vitality.[50] Without this accounting of order and disorder, entropy reaches its maximum potential and everything grinds to a halt.

Thus, according to Burnham, the state of inertia is avoided by *negentropy*: a system's ability to reach outside of the system defining it, drawing in new data which is inherently unpredictable but contains the potential for more information, thus maximum entropy *(*"Real Time Systems" 50). *Negentropy,* then, is not to be taken as a negative factor as the term suggests. Rather like Goodman's *show forth* it *brings forth* the potential for information in the form of data from outside a system and is central to the nature of self-becoming. Understood in this way, it is *negentropy* that is responsible for the poiesis of a system.

Both entropy and negentropy are in a sense inverse measures of the same thing – the amount of order within a system – and are practices which work in conjunction with each other. 'Outside' of a given structure, data is unpredictable and 'meaningless'. However, its unpredictable nature is essential to the vitality of *being* whose structure reaches out to consume it, thus producing information and increasing entropy. So it is, Burnham argues, art must always be in the process of reaching outside of its structures, simultaneously subsuming data and reconfiguring itself as information:[51]

> Negentropy is the ability of information to increase the structure and potential energy within a system. Such information is only obtained by expanding the energy of a system outside the one receiving information. Thus the art system has maintained its vitality by constantly reaching out of itself for data. ("Real Time Systems" 50)

It is in this sense I suggest that Burnham seems to understand art as a real-time system – one in which *negentropy* reaches outside of its own *metaprogram* to realise itself as semantic information in the present. It is important to note that while Burnham draws on concepts from what we now understand as *information theory*, his conception of art as an information-processing environment is clearly not limited to technological systems: he incorporates Hans Haacke's *Chicken Hatching* (1969) within his understanding of real-time practices as readily as he does Haacke's *Visitor Profile* (1970). What is proposed, then, is a far broader, non-partisan, formal ontology which focuses on the agency of systems rather than the materiality of the content.

With this understanding of a system's real-time self-meta agency, we can now return to the question of the prefix 'post' as signifying something other than that which comes after the object and make sense of Post-object Art's real-time commitment. In self-meta systems, entropy is managed by continuous real-time events of self-becoming that I identify here as *practice*. A self-meta system thus functions as a form of auto-poiesis from which information emerges as a result of the practice of the system. Looking beyond the object then does not mean to look at what happens when objects are no longer instrumental in making meaning – post-object – but to shift our focus from the object to the system while never losing sight of the object as part of that system. In fact, following Husserl, the *object* I suggest is phenomenologically maintained by a subject who, fading out of focus, sees beyond herself to experience the object. The post-object

can then be taken as a Husserlian return to "things themselves" when objects are intuitively understood as arising out of relational practices (*Logical Investigations* 168). Although, as already discussed, such pure ontological reduction of this nature is problematic with regard to the differentiated digital entity that we seek to understand, metaprogram structures such as those proposed by Burnham and Schrodinger negate the transcendence of phenomenological intention by encasing it within the relational framework. There is no outside, beyond or before as every object that has relation to another object is ontologically committed to that object. All intended objects are thus part of the entropic potential of the system that enables it to reach beyond itself and maintain semantic vitality. Yet in this intending gaze we never lose sight of ourself, as we are the lens though which we produce meaning. While phenomenological intentionality looks beyond itself as subject, relationally it can never look beyond its own metaprogram, for it incorporates every *known* object as data within its entropic system. Nothing, including the subject, is a priori of relational practice.[52]

Again here if we return to Dadson's *Earthworks* we can see the agency of *negentropy* being played out as the meta-system of the work attempts to *intend* participants as objects against the background of network noise that seems intent on obscuring them as much as the weather does. Developing the previous assertion that the work operates as a system in perpetual meta-dynamic with the context of its production, we can now identify the method that sustains it as the practice of *negentropy*. That the data in the form of recordings, observation and images seem unrelated is of no concern to the practice of *negentropy*. In fact, this disordered data is what the metaprogram of the work requires to avoid entropy and maintain semantic vitality. This, too, makes sense of Dadson and Cardew's use of improvisation as negentropic practices that balance the highly entropic structures of the work.

Post-object Art's commitment to the 'real' is in fact a commitment to the *practice-of-the-work* as a semantic agent. It is, then, through practice – the practice of maintaining entropic potential within a system – that meaning is constructed. It is in this way that Post-object Art requires we look beyond the object to the metaprogram that constitutes the real-time system of the work. As seen through the analysis of Post-object work, practice emerges as a core methodological concern. But exactly what does it mean for a work to practise itself as suggested above?

9.2.1 **The practice of work**

In the previous section I introduced the idea of *practice* as the method by which semantic vitality is realised through a reading of Post-object Art's real-time commitment. This commitment is seen as functioning like Burnham's systems thinking which draws on trans-disciplinary cybernetic concepts proposed by Lilly, Shannon and Schrodinger. While this serves to establish parallels between information processing structures and artistic frameworks, in this section I want to explore how this notion of *practice* ontologically informs the digital and how it might *environmentally*[53] operate with regard to artistic research – how forms of practice might function as rigorous methods in an academic research framework. Exploiting the ambivalence of the noun *work as a* deverbal, I will firstly address practice as a self-emergent method through an analysis of Heidegger in relation to Burnham.[54] This analysis eventually serves to identify two methodological sub-classes of *practice* that are discussed with regard to academic research paradigms, an argument that leads to the proposition of practice as a real-time system of knowledge production.

Burnham's commitment to real-time systems is vested in his critique of the art world, as evidenced through the notion of the self-metaprogram. As mentioned earlier Burnham's concept of self-metaprograms frames the art world as part of the artwork, and is the basis on which Burnham laments the scarcity of artists working *with* art systems ("Real Time Systems" 55). *Systems Aesthetics* agenda, then, is in part to debunk the formalist illusion that objects in themselves "are the material basis for the concept of the 'work of art'" (Burnham, "Real Time Systems" 50).[55] Taking Burnham's use of the word *work as a* deverbal noun, we can understand the method through which metaprograms posit the art object as an event – although Burnham himself appears not to have fully realised the potential of this proposition. Art as *work*, becomes a work of art not simply by virtue of aestheticising systems as product – a process by which systems are appropriated as just another avant-garde signifier committed to the *maintenance* of art criticism (Ragain, "Dissolved in to Comprehension" 193-206) – but, I suggest, by ontologically committing to the *work* of art as a real-time event.[56] Although Burnham's promotion of systems art subsists on a critique of semiotic reductionism that threatens to leave the artists "with little if anything to do" (Ragain, "Dissolved in to Comprehension" 201), he was unable to anticipate the subsequent objectification of the *systems aesthetics* by technology, and assignation of the digital to the status of objecthood. To unpack the significance of this deverbal slippage between noun and verb – object and event – we need to return to Heidegger to inform the methodological construct of metaprograms.

As discussed earlier in section 8.8, *being, or* Dasein, is central to Heidegger's philosophical proposition and marks the ontological distinction between *being* and beings as signified by the hyphen that Heidegger starts to use in his later work to separate das and sein (there and being). In comparison, Burnham's formalist critique recognises that while the work of art is empirically *there* (das), this is ontologically different from its *being* (sein) art. For an artwork to be, it must *work,* not

just be *a* work. Of course, this assertion has parallels with Heidegger's analysis in the *Origin of the Work of Art*. We will come to a fuller discussion of this text shortly,[57] but for now by simply interpreting *work* as *being* we can gain new insight into Burnham's appropriation of Lilly's term metaprogram as that which "considers sources, inputs, outputs and central processes rather than just the end result of the process" (Lilly 22). Indeed, if I dare take this comparison one stage further, Lilly's inception of metaprogramming affirms the connection between Dasein and *systems aesthetics* as an *event* rather than an outcome, through an ontology of the mind as a biological computer driven by a "critical control metaprogram labelled I" (Lilly 7). According to Lilly, the parallel processing affordance of metaprograms enables a sense of simultaneity that is taken as the procedural ontological equivalent of *being*. However, for fear of evoking Lilly's transcendent 'supraself meta-creators', this is as far as I am prepared to take this analogy. So we will quickly return to the relatively mundane problematic of things-in-themselves to consider metaprogram methods in relation to *being*.

Following Heidegger, the post-object proposition presented by Burnham's metaprogram is, I suggest, not a strict ontological question commensurate with the concept of the Kantian '*thing-in-itself*'. Kant's transcendental idealist position asserts that, in appearance, "objects conform to mind rather than mind to objects" and thus the '*thing-in-itself*' is beyond our knowledge of it (Bryant "Onticology").

> I understand by the transcendental idealism of all appearances the doctrine that they are all together to be regarded as mere representations and not things in themselves, and accordingly that space and time are only sensible forms of our intuition, but not determinations given for themselves or conditions of objects as things in themselves. (Kant, *Immanuel Kant's Critique of Pure Reason 345* A369)

Kant contrasts his idealist position with an absolutist interpretation of transcendental realism in which space and time subsist independently of our perception of them, and are given in themselves as a priori. This applies regardless of whether you follow Liebniz's relational argument or Newton's absolute argument – as realist arguments, both treat space and time as independent of perception.

> To this idealism is opposed transcendental realism, which regards space and time as something given in themselves (independent of our sensibility) (Kant, *Immanuel Kant's Critique of Pure Reason 345-355* A369).

But neither realist nor idealist arguments seem helpful here. Both remain problematic regarding the question of the digital as they negate differentiation through an insistence on transcendence and the withdrawal of *the thing-in-itself*.[58] If we make ontological claims to the *thing-in-itself* on the basis of an idealist argument, then the *thing-in-itself* is predicated on our experience of it, and thus cannot be differentiated from us. If, on the other hand, we adopt the realist position that the *thing-in-itself* is a priori given of our experience of it, then we have no way of confirming its existence independent of us.[59]

Providing an indication of a way forward out of such subject/object dualisms, Heidegger's ontological difference can be seen as realist in the sense that through the construct of present-at-hand, entities are seen "*quite independently of the experience* by which they are disclosed", and idealist in the sense that it is human being (Dasein) that reveals things – "that with and through its Being, this *Being* is disclosed to it" ("Being and Time" 228 & 32). The deverbal duality of *Being* thus provides a resolution to the opposing ontological arguments of realism and idealism by concatenating both within the one word. *Being* thus constructs an ontology in which subject and object are covariants that

deny both a priori existence of things-in-themselves and a posteriori knowledge of things-in-themselves.[60]

Returning to consider the *work* of art in these terms we can, through a reading of Burnham's real-time metaprogram, posit art as a form of *Being* in that it rejects dualist ontologies in favour of a covariant *Being* 'that discloses itself as *work* with and through its *work*'. Citing Douglas Huebler's work, Burnham further defines the term metaprogram as a method that "creates a quality of experience that locates itself 'in the world' but is not called upon to judge, nor to infer 'meaning'" ("Real Time" 53). In fact, the manner in which the referenced work – Huebler's *Site Sculpture #42, Parallel Pieces* (1968) – uses mail offices distributed along the 42° parallel, is reminiscent of Dadson's use of equinox in *Earthworks*. In both pieces the nature of the *work* is defined by the work's nature – the metaprogram of latitude and the solestial configuration of the equinox. The very nature of the *thing* is, that it is, through its meta inputs and outputs, inherently ontologically uncertain as it vacillates between being work and work being.

These two artworks should, however, be understood as more than simply a real-time system in which the artefact is inseparable from its means of production. This would imply there was some form of distinction in the first place, thus insisting on a post-process object and evoking problems of transcendence. Here, then, we should note a point of distinction between Burnham's systems aesthetics and process art which, in his critique of Rosalind Krauss's *Passages in Modern Sculpture* (1977), Goodman describes as being limited by "Wolfflinian dichomities"[61] (Ragain, "End Game" 68). Rather, in keeping with the concept of '*post*' as a looking beyond, I wish to pursue an alternate reading: one in which we should understand things-in-themselves as *being-there-working* – or as being *practice*.

The challenge of verifying this conception of *practice* without resorting to conjunctive reasoning – logic based on a combination of two givens – is the challenge of maintaining methodological coherence with a subject, for what is proposed is that we cannot take a subject other than *practice (Being)* as given in itself, and thus no subject other than practice can be differentiated.[62] In denying the subject as a thing-in-itself – by making it conditional on *practice* – we must ask if is it even possible to present a verifiable methodological framework without turning *practice* itself into a subject and thus negating the proposition? Indeed, this is the suspicion under which practice-based research has fallen – as being too subjective to constitute knowledge. To put it in the context of Burnham's thinking, we must ask what is the system by which we can re-ontologise *work* when the *work* calls itself into question as a method?

9.2.1.1 **Formal Indicators**

While Burnham's rather undeveloped interpretation of Lilly's meta-programming concept is not instructive here, we can leverage the connection between *Being* and *work* to consider how Heidegger's method of formal indication constitutes a response to this methodological question. I will spend some time on this before returning to consider Burnham's metaprogram because it is core to understanding the methodological platform of research.

It is important to stress, however, that even though this method occupies a central role in the conceptualisation of a digital practice, it has inherent limitations. Within Heideggarian terms of reference these constraints do not compromise the methodological proposition. It is only when we step outside the contingency of the *beyng* that there is a need to radically refine this method. However, before we can do this, formal indication itself needs to be positioned as method with regard to artist's

practice and the production of knowledge. The remainder of this section assumes this purpose, while Appendix 10 addresses the phenomenological limitations of this in order to articulate a method through which the digital as an in-itself can be practised.

Heidegger first introduces the principle of formal indication in a 1921/22 lecture series. Subsequently published as *Phenomenological Interpretations of Aristotle,* the lectures were, as the subtitle suggests, intended as an *Initiation into Phenomenological Research*. As a grounding in phenomenological research methods, these lectures critique the dominant methods of scientific objectification as dictated by inductive methods, and promote instead an indicative method that "does not present fully and properly the object which is to be determined. Indeed, it merely indicates, but, as genuinely indicative, it does give in advance the principle of the object" ("Phenomenological Interpretations" 26). Even though this is the clearest definition Heidegger gives us for what he means by formal indication, it remains frustratingly elusive as a method.[63] Yet it is this elusiveness that is itself ultimately intended to be insightful. Indeed, it is scarcely used in *Being and Time* for the very reason that we are attempting to resolve – namely, the issue of "how does now one gain access to the question of the meaning of Being without also engaging in the corruption of covering it up" (Streeter 414)?

In the most general terms, Heidegger's method can be taken as a derivative of Husserlian phenomenological methods in that he adapts Husserl's *indexical* construct. There is no need to recount that development here as it is well documented,[64] and it suffices to note that Heidegger takes from Husserl a phenomenological method of *indication* as a way of maintaining the *indexical orientation* of the indicator (Streeter 421-423). In other words, Heidegger's method of formal indication emphasises a first-person commitment to meaning that is inherent in the notion of *Being*. It does this by *pointing* to its subject in

such a way that "the hearer (reader) occupies the role of the 're-enacted', the one upon whom fulfilment depends if there is to be fulfilment at all" (Streeter 423). Rather confusingly, the use of the term 'formal' here has a totally different meaning from its use in Appendix 8, where it denoted a method of formalised logic.[65] In this context it takes its meaning from Husserl, who uses it in a phenomenological sense to differentiate between material fact and ontological essence (Smith, "Pure" Logic"). It is not intended to be taken as an explicit or official statement, but rather as the implicit acknowledgement of the person or, (as I will argue later) the thing doing the indicating (Shockey 532). 'Indication' is read as providing "direction and principles" in such a way that the reader/viewer maintains the agency of revealing (Dahlstrom 783-784).[66] This is vital to Heidegger because such revealing – or unconcealment, as Heidegger would have it – is an essential quality of *Being* in the world and thus a revealing of *truth*. Truth in this context is simply the openness of *unconcealment that reveals things-in-themselves*.[67] Things-as-they-are, are only revealed or made present at hand by *Being in* which there is the inherent truth of un-concealment. Phenomenologically speaking, what is perceived is real for you. This is essential to Heidegger's ontological proposition which demands a potent agency of *how* rather that *what*. Only by methodologically maintaining the agency of the reader/viewer can Heidegger make a case for *Being* as *truth* – where truth is taken as an un-concealing of the thing-in-itself. "'Formal indication' points us in the direction in which we are to look." (Gadamer in Kisiel, 33)

The methodological problem Heidegger faced was how to communicate the concept of *Being* through *Being* – how to "point to truth without making conclusive their claims to truth", anticipating that others would follow, thereby *unconcealing* the ontological *truth* in their own *Being* (Streeter, 425). The alternative would be to explain the subject in empirical terms through inductive reasoning, a method which in Husserlian phenomenological terms would fail to take into account its

own normativity and thus negate the hermeneutic validity of the claims being made. Heidegger, having inherited a hermeneutic philosophical stance from Husserl, sought a more radical method "that did not merely describe how the world *is*, but showed how it *must* or *ought* to be" (Rouse 1).[68]

A consequence of Heidegger's method is – as evidenced in his writing style – that the conventions of academic reasoning, whereby the framework of an argument is revealed to us in advance, is rejected. Instead, in reading Heidegger, we find ourselves fighting to find direction in and make sense from the agency of our own interpretation – attempting to connect threads of ideas that we must discover for ourselves in the metaprograms of texts. As Hans-Georg Gadamer explains: "We must learn to say what shows up there and learn to say it in our own words. For only our own words, not repetitions of someone else's, awaken in us the vision of the thing that we ourselves were trying to say" (Gadamer in Kisiel, 33).

While Gadamer's development of Heidegger's ontological difference offers a clear, methodologically premised critique of inductive methods and the 'natural sciences' (Gadamer 38-43), his position is subtly distinct from Heidegger's on several significant counts. These I take in part from Walter Lammi as being fundamentally governed by the question of *method* and time (448).[69] Although Gadamer no more provides a method in *Truth and Method* than Heidegger does in *Being and Time,* language serves significant yet different methodological functions for both. These functions are relevant here as they help to clarify the way in which indicative methods are 'practised' in this thesis.

Rather than taking Gadamer's clear and accessible writing as a 'taming' of Heidegger that helps bridge the indicative gap between writer and reader as suggested by Jürgen Habermas (in Lammi), both the method employed and philosophical function of language presented by

Gadamer are seen here as working against an ontologically differentiated self-becoming that is the intended function of the formal indication and *Being*. In this, the difference between Gadamer and Heidegger is irreconcilable: for Gadamer, language is being which can be understood; whereas for Heidegger what can be understood is *Being* itself.[70] This is not to suggest that language itself is not a form of *Being* but, rather, that language is understandable only as *Being*. It is important not to misrepresent Gadamer here, though. While he is – due to his position in relation to the human sciences – deeply invested in language, he is not referring exclusively to textual language. In this regard, Gadamer takes language as "any language that things have" (470). For Gadamer, language is a universal construct that stems from the hermeneutical phenomenologies' ontological constitution: "Thus we speak not only of a language of art but also a language of nature" (Gadamer 470). The distinction here between Heidegger and Gadamer, then, is not so much language as it is how to enter the hermeneutic circle.[71] This, however, is essentially a question of how you deal with time.

9.2.1.2 **Fore-told**

In that the Hermeneutic circle is concerned with the compounding referential relationship between parts and wholes, it is taken here to inform the question of a digital practice: how is it that things that are differentiated, and thus separate from the whole, can also be part of the continuity of whole? And conversely, how is it that a continuous whole can even be conceived of, if it is made up of distinct parts? Thus the hermeneutic circle, that we see played out in different ways in Gadamer and Heidegger's approach to language, presents us with two different methodological responses to these questions, each intent on providing us with different points of entry into the hermeneutic circle. It is worth expanding on this briefly here as it helps clarify the reason for this thesis' methodological engagement with Heidegger's indicative method.

Heidegger's use of language is a logical result of the method of formal indication that seeks to point or perhaps "throw" the reader into the space of the hermeneutic circle; the space that is of the hyphen in Da – sein, the clearing of the there-being. Our entry to the interpretative space of understanding is through the *fore-structure* of *facticity*[72] which "implies that an entity 'within-the-world' has Being-in-the-world in such a way that it can understand itself as bound up in its 'destiny' with the Being of those entities which it encounters within its own world" (Heidegger, *Being and Time* 82).[73] *Fore-structure* is a given of the facticity of being in the world.[74] It is the forward bias of *fore-structure* which constantly pushes being beyond itself into self-becoming and understanding that is, for Heidegger, the point of entry into the hermeneutic circle. That Dasein already has *fore-structure* is an existential state of the *facticity* of *Dasein's* being-in-the-world "in such a way that it can understand itself as bound up in its 'destiny' with the Being of those entities which it encounters within its own world" (Heidegger, *Being and Time* 82).[75] Formal indication is simply a method of creating a clearing in which the fore-structure of *Dasein* can project itself into the hermeneutic circle.

Gadamer on the other hand does not use the method of formal indication and thus his treatment of language and his point of entry into the hermeneutic circle is very different from Heidegger's. Instead, Gadamer develops the concept of "historically-effected consciousness" that looks to the continually forming horizons constructed in the interpretative reading of a text (300-341). For Gadamer, understanding thus involves an awareness of the cultures and histories in which subject and object are embedded as they enter into the hermeneutic circle.[76] Albeit that these horizons are dynamically fused with the process of becoming, the "horizon of the present cannot be formed without the past" (305).

Even though Gadamer is careful to emphasise the contemporaneity of the past and present in becoming, this does not provide a methodological solution to the question of differentiation on two counts. Clearly such a contextual phenomenology would immediately negate the independence of the-thing-in-itself by failing to resolve the question of self-becoming that is a necessary condition of the digital. The self-becoming of an historically-effected method cannot in-itself be said to be of-itself, as it becomes in part through a comparative temporality that draws on the past. We are left, then, with confirmation that despite, or perhaps because of, its aesthetic obscuration, Heidegger's method of formal indication can be *provisionally* adopted as a viable basis for the development of a discrete practice.[77]

While there is more to say regarding Heidegger's method with regard to understanding differentiation and the *Origin of Work of Art* (2006), we must first return to our point of departure which was a discussion of Burnham's metaprogram. As stated earlier, Burnham's call is for a *systems aesthetic* that ontologically redefines art as a dynamic self-becoming event that forms in the meta structures established by the artist. This, I have suggested, is an ontological shift from *art-work* to *art-as-work*, and directly parallels Heidegger's *ontological difference* that seeks to present the thing-in-itself as a *how rather than a what*.

The question that seems to evade Burnham is, how to establish a method for this re-ontologisation without getting drawn into some form of transcendent instruction that negates the ontological proposition of work as a *thing-in-itself*? For Burnham, this question never seems to arise because his horizon is in part conditioned by the historical-affected metaprograms to the art world – the "art movements, significant stylistic trends, and the business promotional and archival structures" that surround the practice of art (Burnham, *Beyond Modern Sculpture*). For Burnham, the *thing-in-itself is* historically indebted. In this regard, Burnham is closer to Gadamer than Heidegger. The 'command structures' that

drive the concept of the metaprogram ultimately lie outside the conditions of their own becoming which, reaching out to their entropic potential, makes them appear as horizon lines inscribed on subjects by cultural and historical conditions. If metaprograms are seen as providing an entry point into the hermeneutic circle, then, in line with Gadamer, they must also be seen as a negation of the discreteness of being through an historical positioning.[78]

On the other hand, if we compare this criticism of Burnham's metaprogram to the reading of Post-object Art as a looking *beyond* the object to the practice of the artwork as becoming in-itself, we find a significantly different point of entry to the hermeneutic circle. As the post-object looks beyond itself, it in effect throws itself forward into the time of its own becoming. While Dadson's *Earthworks* and Allen's *Computer Dance* have been discussed in terms of their use of structures, this is not what defines them as digital works. As much as Dadson might draw scores as metaprograms for the work, they do not insist on positioning the being of the work historically; instead the scores serve as indicative structures that invite improvisation within the becoming of the work. The work does not look back to the horizon of those instructions from within the hermeneutic circle as it is not prescribed by it. Rather, the scores, like Heidegger's writing, point to a clearing in which the work might self-realise.

The proposition made here is that Heidegger's method of formal indication provides a platform from which, following Burnham, a line of reasoning can be pursued that aims to look *beyond* the object to the meta-prgramme of the artwork becoming itself. In Burnham's terms, formal indication serves as a method – a "'trigger' for mobilising the information cycles" (*Beyond Modern Sculpture* 50). It presents us with a resolution to the methodological challenge of how to look beyond the object-based ontologies in which the digital has become embedded as being purely techno-computational, towards a post-object-oriented

ontology of differentiation that is based in the method of becoming itself. Further to this, by establishing parallels between the *work of art* and *Being,* I have proposed the work of *practice* as a revealing of knowledge, and argued that within phenomenological constraints it provides a rigorous, methodological framework from which to make claims to knowledge. However, this needs to be taken one step further in light of the treatment of the deverbal use of *work* which, as noted earlier, leads to consideration of two methodological sub-classes of *practice* implicated in the becoming of the work of art.

9.2.2 **The work-of-art**

While the distinction between the *artwork* and the *work of art* mirrors the ontological difference between the *what* and the *how,* the *work-of-art* itself also demands to be understood in terms of the method of becoming because, as such, the work of art is inherently temporal – existing as discrete subjective experiences through *Being.* However, following Heidegger's onto-epistemic orientation in the *Origin of the Work of Art,* the term 'work of art' rather confusingly vacillates between meaning the object thingness of *what* and the active thingness of *how*.

For clarity, the use of *artwork* here refers to the *what* of the art object, and the *work-of-art* to the global *how* of art practised. In addition to this, I introduce the terms *work-of-the-artists* to identify the methods used by the artist in producing the *artwork,* and the *work-of-the-audience* to address methods used by the audience in engaging with the *artwork*. The *work-of-art* is thus the totality of the *what* and the *how* of *artwork,* artist and audience interactions. The tripartite modelling of the *work-of-art* is not without precedent. From Harold Rosenberg's the *Anxious Object* (1964), to Amelia Jones' *Body Art/Performing the Subject* (2007), and *Claire Bishop's Artificial Hells* (2014), it has appeared in various guises and provides a useful structure to position this work against[79] – 'against'

because here the use of this approach is an analytical ploy, as will eventually be shown. The dismantling of *the-work-of-art* into its parts in this way is a conceit. Rather than buying into the traditional artefact-artist, viewer dynamic, these terms are only ever intended here to provide a way of teasing out the relational agencies that operate between these 'actants' as formal indications so that *the-work-of-art* as a whole can start to be methodologically satisfied in differentiated terms. While this risks emphasising the constituent parts, the focus is always on developing an understanding of relational practices – formal indication in particular – as a method of knowledge production. The emphasis is always on *work* rather than the subject of that work. Although this focus might suggest an allegiance to 'participatory art' – and indeed there are points of common interest – the commitment here is quite different. Compared to Bishop's definition of 'participatory art' there is no common interest in social engagement here (*Artificial Hells*). Rather, this inquiry is more concerned with the abstract onto-epistemic dimensions of how things come into being through relations. In that the method of formal indication suggests an indicative subject and object, relational or participatory might seem to be appropriate terms to use. However, in order to distance this thesis from the social aspects of 'participatory art', and at the same time avoid association with the detachment of terms such as 'spectator' or 'viewer', the term 'audience' is used here. Although as we will see, this too is ultimately subsumed by the totality of the *work-of-art* as a method of becoming.

The preliminary methodological position set out here is not a 'Humpty Dumpty' redefinition of terms in which words are twisted to suit the argument (Frayling 2).[80] Neither is it an irresponsible 'straw-man' argument seeking to escape accountability (Haraway, "Promises of Monsters" 483-484). Instead, the argument takes on the 'thorny issue' of what Christopher Frayling calls research *for* art – "Research where the end product is an artefact – where the thinking is, so to speak, *embodied in the artefact*…" (5). However, rather than approaching the

question from the perspective of research, as Frayling and many others do, the argument here focuses on the construction of knowledge. The tendency to centre the debate on research is reflected in the titles of many recent publications where, as variations on the theme of 'practice as *research'*, 'art as *research'* or '*research* in the arts' and so on, emphasis is placed on research as the determinant term.[81] While many would argue that this is necessary in order to position art practice within a broader academic framework, this is seen here as an implicit internalisation of relativist paradigms of knowledge production that are inherently detached from *practice*. Thus 'spoken', the methods that disqualify practice as research on the basis of their inadequacy when it comes to satisfying institutionalised criteria for knowledge production, are muted.[82] At best, *practice-led* methods are seen here as subordinate to the dominant academic research frameworks.[83] By focusing on knowledge generation rather than research output, this project aligns itself with Donna Haraway's critique of disembodied scientific objectivity and instead seeks to practise situated objective methods that can never be fully known in advance ("Situated Knowledges"). Thus, "situated knowledge" is not a substitute for academic rigour; in fact, as argued by Haraway, it is a more critical methodological position than the "god tricks" of relativism that promise objectivity ("Situated Knowledges" 584). As Haraway explains, "The god trick is self-identical, and we have mistaken that for creativity and knowledge" ("Situated Knowledges" 587). The alternative Haraway formulates is the "material-semiotic actor": borderless generative becomings that materialise in embodied interactions ("Situated Knowledges" 595). In its 'trickiness', the material-semiotic actor practises a knowledge of becoming that is equivalent to the unconcealing function of Heidegger's formal indication. Both play 'tricks' with the ontologies of things-in-themselves and insist on a form of knowledge production that is a bringing forth out of *essence* – essence being that which things project ahead of themselves as procedure or, we might say, methodology. Methodology, then, is that which "accounts for something through something known, and at the same time confirms

the known through that unknown" (Heidegger, "Age of the World Picture" 61). In the case of art, this necessitates an adherence to its own 'inexactitude' or situatedness as a methodology.[84] The 'trickster' that Haraway and Heidegger recognise is thus a methodological object-subject 'double-movement' that is formed in practice rather than in observation.

Barbara Bolt also makes this connection between Heidegger and Haraway, but perhaps more importantly she also locates knowledge in the context of practice-as-research, and identifies three ways in which art *should* be understood as research: as an unconcealing rather than a correspondence; through a practical engagement with things; and, as an emergent process rather than an outcome (Bolt, *Heidegger Reframed* 197-198). While Bolt is insightful, her argument is limited in that it fails to ask the question of how this is achieved and, in her analysis of student work, she repeatedly slips back into reductionist research narratives (Bolt in Boucher, 152-156). Ultimately, with regard to understanding the practice of knowledge, Heidegger is more helpful than Haraway in my view. However, it is not the 'practical' examples of hammers, stones and lizards that help us here, rather it is the even more abstract concept of formal indication that is instructive.

Much of Heidegger's argument in *Origin of the Work of Art* has already been laid out here in the discussion of how formal indication and hermeneutics serve to frame the *thing-in-itself* – the *thing-in-itself* being central to the question of differentiation. The reason for developing these themes independently, instead of simply referring to *Origin of the Work of Art* from the start as might have been expected, is that Heidegger assumes our prior knowledge of them. In keeping with his own method, references to formal indication and hermeneutics in *Origin of the Work of Art* are oblique at best.[85] Indeed, Heidegger talks to the circular nature of art and artwork while never mentioning hermeneutics but, as stated earlier, he does not address his method directly outside of *The Basic*

Problems of Phenomenology. In order to be explicit about the foundations of my argument, it was therefore necessary to build an understanding of these concepts before arriving at *Origin of the Work of Art*. We turn to it now, not to validate those arguments, but to further develop the methodological rational as it relates to the *work-of-the-artists* and the *work-of-the-audience*[86] as, in order to meet the criteria of research, it is necessary that the method used is operative in both conditions. These two approaches are developed in the following section.

9.2.2.1 **The work-of-the-artist**

The *work-of-the-artist* is no less the *work-of-art* in the literal sense that it is the work of making art. However, the *work-of-the-artist* is also predicated on the *artwork* that is the formal indication, from which the *work-of-art* is set forth for the audience. The *work-of-art* is thus thrown into a hermeneutic circle in which "the artist is the origin of the work" and the "work is the origin of the artist" and "neither is without the other" (Heidegger, *Origin of the Work of Art* 1). While Heidegger begins his analysis of *Origin of the Work of Art* in this way, it quickly becomes apparent that his purpose is not simply to establish an ontological framework for art, but to use the hermeneutic methods of art as a way of articulating the thingly becoming of being itself. The work of art thus sits at the very core of Heidegger's onto-epistemic thesis in that the thingness of art embodies the origin of becoming.[87] The origin is that of which we can ask no more. It is that behind which there is nothing, and by which the *thing-in-itself* is *differentiated*.

In the context of *The Origin of the Work of Art,* formal indication is a method employed in the *artwork* for 'leading' the viewer, or in Heidegger's case the reader, to reveal the *thing-in-itself* though their own *Being*. While this can be seen as a strategy of the *artwork* – perhaps

even one that operates like a form of code waiting to be executed,[88] it does not follow that this method is employed in the production of the *artwork*[89]: methods of production are not inherently embedded in the artefact. Given that we are concerned fundamentally with digital practice, the question to consider is to what extent formal indication – as interpreted in *The Origin of the Work of Art* can be taken as a discrete method of artistic production and, if it can be taken as such, then who or what would be doing the indicating and to whom? In asking this question it seems that we once again are confronted by the problem of entry into the hermeneutic circle: even if it is the artist doing all the indicating to themselves, then surely this, too, necessitates some a priori condition that is as problematic to a discrete ontology as any other subject/object relation – even an a priori self necessitates a degree of objectifying differentiation.

The solution put forward by Heidegger in *The Origin of the Work of Art* is that the activity of making itself is less a sense of the hand working than it is of knowledge working, or knowledge being set forth. Heidegger's argument develops out of an analysis of the techne (τέχνη or τεχνίτης[90]) – having the dual reading of artist and handwork, as being founded in alethea (ἀλήθεια[91]) – literally the state of not being hidden. To not be hidden is to be seen or known.[92] Thus alethea is the revealing of the truth of *being*. The artist's *being* (techne), being one and the same as their handwork, brings forth the unconcealment of knowledge:

> The word τέχνη names rather a way of knowing. To know is: to have seen, in the wide sense of seeing that says: to perceive what is present as present. The essence of knowing rests, for Greek thinking, in ἀλήθεια [alethea], i.e. in the unconcealment of being. This bears and leads every comportment towards being. Τέχνη, as knowledge experienced in the Greek way, is a bringing-forth of beings, insofar as it brings what is present out of concealedness properly *into* the unconcealedness of its outer look to *the fore*;

> τέχνη never signifies the activity of making. (Heidegger, *Origin of the Work of Art* 42)

The notable conclusion of this quote points out that knowledge generation is *not* a practical activity, implying that the definitive aspect of the *work-of-the-artist* is not that of physically making, rather it is the event of bringing forth knowledge – alethea. Yet Heidegger also reminds us that while the physical activity of making is not in itself an act of knowledge production, neither can the artist bring-forth knowledge without it. The *work* of art is not a process of doing by the artist. The *work-of-art* is the formal indication through which *Being* comes to knowledge. A similar argument is framed in terms of 'practice-led' research, by Paul Carter's conception of *material thinking*.[93] *Material thinking* discourse centres around a small group of interdisciplinary researchers in Australia and New Zealand,[94] although through the involvement of researchers such as Bolt and Katy Macleod, it is more broadly engaged with 'art as research' debates.[95] *Material Thinking*, as articulated by Carter, is a form of "*creative research*" which sits in contrast to narrow "reductive empiricist notions of research" (*Material Thinking* 7). As a form of knowledge production it is concerned with the process of articulating a kind of research that "bring(s) something into being that was not there before" ("Material Thinking" 7), and locates such processes of un-concealment and 'invention' within a complex set "of interactions involving factors of bodily possibility, the nature of materials and physical laws, the temporal dimension…" (Morris in Carter, *Material Thinking* 8). As such, it rejects the objectification of art as research though scientific paradigms of knowledge production.

Despite apparent parallels between Carter's framing of art practice and Heidegger's reading of techne, there is no direct discussion of the *work-of-art* as a formal indication in *Material Thinking* circles. Bolt is one of the few researchers in this area who attempts to relate *Material Thinking* directly to Heidegger. However, her analysis is limited to a discussion of

vorhandenenheit (present-at-hand) and *techne* (Τέχνη), as presented in two of Heidegger's better known texts[96] – *The Questions Concerning Technology* and *Being and Time*. While the concepts of *vorhandenenheit* and *techne,* as presented in these texts, are clearly relevant and help inform *material thinking*'s 'practice-led' positioning, they support only a limited understanding of Heidegger's explication of bringing-forth with regard to art practice.[97] Indeed, Bolt's narrow reading misinterprets significant aspects of the Heideggarian framing of knowledge. While she is correct in citing handwork – or, as she calls it, 'handlability' – as the process of conjunctive material revealing, she links this too closely to material *physis* in an attempt to validate 'practice-led' research methods. The result is a mistaken justification of *Material Thinking* as tacitly informed research that presents art practice as simply a subject for explicit written reflexion (Bolt, "Heidegger, Handlability").

Heidegger makes it clear, however, that it is *not* the performative action of practice – the handwork or techne (τέχνη) of making – that produces art; rather it is the *work-of-the-artist* as *Being* that brings forth knowledge. *Being* is arrived at through the method of formal indication in which the artist is thrown forward into knowledge as a *thing-in-itself*.

The 'practice-led' research methods presented by Bolt and Carter, are then a weak form of formal indication that oversimplifies what artists do in producing knowledge, and mistakes handwork in itself as the method of knowledge production.[98] For Heidegger, the artist's claim to knowledge production is not through making as such; rather it is in *being,* arrived at through formal indication. Of course, the aspects of practice that are so problematic in academic terms – identified by Carter as failing to satisfy semiotic image-text discourses – are amplified by this approach (Carter, *Material Thinking* 13). Formal indication makes no compromise on explication through discourse and is resolutely discrete in its temporal becoming. As a method, then, formal indication is in radical disregard of the discursive conventions of academic research, and takes

the 'art as research' debate well beyond the familiar limits: of dialectical reasoning (Holdridge and Macleod); of the validating methods of reflexivity and reflectivity (Dallos and Stedmon); the explicit, tacit and ineffable models of knowledge (Biggs); 'expositions' of art as research (Schwab, *Exposition of Artistic Research*); perhaps even beyond the subjectivity of isolationist self-defined criteria (Biggs). The point that we should take heed of is that if the *work-of-art* is to make a real contribution to academic knowledge then it needs to separate itself from the explication of things and define itself in terms of the original meaning of knowledge – unconcealment.

> Thus the explication of the thing according to stuff and form, whether it remains medieval or becomes Kantian-transcendental, falls into currency and self-evidence. On account of that, it is, no less than the other named explications of the thingness of the thing, an overtaking of the being-thing (das Dingsein) of the thing. (Heidegger, *Origin of the Work of Art* 14)

However, we are not concerned with the discursive aspect of method here;[99] simply the method by which the activity of art making can be seen to make a claim to knowledge production in and of itself. As a method of knowledge production within the *work-of-the-artist,* formal indication necessarily sits outside 'practice-led' arguments that attempt to "give their work a kind of discursive legitimacy" (Carter, *Material Thinking* 12). Neither does it yield to the sort of reflexive knowing promoted by Bolt as being the function of the exegesis ("Non Standard Deviation"). In fact, following Heidegger, such explications of the *work-of-art* actively obstruct the production of knowledge by instrumentalising work – negating formal indication and limiting the entropic potential of *Being*.

As such, we might return to consider Post-object Art's commitment to 'real-time and space' in the light of *formally indicative* methods. As

already established, in Post-object Art practices where the structure of the work provides for a method of organising otherwise differentiated parts, we are propelled past the materiality of the object without negating it. As seen in the earlier cited works of Allen and Dadson, this management of real-time events most obviously manifests as various forms of instruction.[100] Daniel Dahlstrom interprets such instructive methods as performative in the sense that the ideas they convey can only be realised though enactment (790). However, it is important to note that such 'scripts' – to use Dahlstrom's term – do not prescribe an outcome prior to the event of the work. Rather, such methods manage entropic potential by *indicating* methods of self-becoming – that we now also understand via Heidegger as a form of knowledge. We need to be reminded here that it is, thus, the measure of unpredictability within a system – entropy – that holds the potential of knowledge production, and conversely maximum entropy – already structured and defined data – holds no potential and is antithetical to the production of knowledge. New knowledge necessarily arises out of entropic disorder. Methods such as instructions function as a formal indication by ordering entropy so that knowledge can be brought forth. As Burnham explained, the circular balance of this system is maintained by negentropy: a systems ability to reach outside of the system defining it by drawing in new inherently unpredictable data *(*"Real Time" 50). To the extent that the effect of negentropy is to maintain the vitality of information *in* the system, we can see it as a method of formal indication. Formal indication can thus be understood as a system's ability to point to that which is outside of the information defining it to draw in new data which, through its inherent disorder, contains the potential for generating new knowledge. Knowledge itself – as established fact – is thus left in a rather unattractive state of maximum entropy – the point at which it "fades away into a dead, inert lump of matter" (Schrodinger 24).

The difficulty in grasping or articulating these concepts is due to the hermeneutic circularity of the arguments presented by Burnham and

Heidegger. Everywhere we turn, our questions are thrown back at us as the answer! We are asked to conceive of art making as an event that emerges out of the very system that it is part of. Further to this, I argue, both see circularity as a necessary condition of knowledge production: Heidegger very explicitly so, through his treatment of alethea as unconcealment; and Burnham less explicitly but nevertheless clearly through his conception of *negentropy* as the structuring of information (knowledge). The key point here is that knowledge[101] is not a thing that can be explicitly stated or invested in an object in any way. Knowledge is not even something that can be tacitly acquired through practice, as suggested by Bolt. Knowledge is the *event* of unconcealment that is arrived at by being pointed in a certain direction by a method such as formal indication.

If we ask what, in the *work-of-the-artist,* does this indicating, the answer is equally as circular: it is the artwork – not as artefact, but as the sum total of the metaprogram as a condition of its production – the *work-of-the-artist*. The *work-of-the-artist* is to reach out of the entropic cycle of the known to that which is indicated in the *work-of-art* itself. Only in doing this – by *being* in work – can new knowledge be revealed.[102]

9.2.2.2 **Making News**

To help ground these concepts it is perhaps useful to compare another of Allen's works – *News* (1976), with its 'reenactment' by Mark Harvey in 2015.[103] The undocumented 1976 performance of *News* consists of a simple action in which the artist, seated facing the audience, intently sets about repeatedly crumpling up and flattening out a single page from a broadsheet newspaper. During the course of the approximately 15-minute performance, the newspaper slowly disintegrates – the shreds falling slowly on the floor at the artist's feet until there is nothing left for him to hold on to.

Treating this as a self-instructed action in which the artist defines for himself a simple task, it is clear that the *work-of-art* is not in the activity of making as techne – the handwork of practice. Yet without enacting the instructions, the potential of the work is never realised. Caught in the circular becoming of the action, the artist knows what they are to do, but they do not know what will happen until they do it. Again we are reminded of Heidegger: the artist is the origin of the work, the work is the origin of the artist, neither is without the other. We are also reminded of Goodman: differentiation through syntactical and semantic concatenation. The artist is intent only on the task that is ready-at-hand, in the essential *being* of the work, as suggested by the formal indication of the self-instruction.

By contrast, in Harvey's 2015 reenactment of *News,* the artist seems painfully aware of the original work that he is emulating, to the extent that his actions appear disingenuous or at least estranged from the original instructions. The performer seemed plagued by the anxiety of representation: Am I doing it right? Are the shreds of paper small enough? This sits in direct contrast to Allen's self-instruction where there is only an expectation of action not outcome. Although Harvey carries out the same actions, the *facticity* of the work is already established. Indeed, it is readily apparent that what Harvey enacts is not so much related to Allen's self-instruction as it is to the object arising from those actions – the *artwork*. This, after all, is assumed to be the nature of a reenactment: to represent. Once having been made manifest as merely present-at-hand, the *work-of-art* – distanced from itself by its own ontic-manifestation, is glaringly absent. Obscured by objective and historicised knowledge, the discrete nature of the *thing-in-itself* that was the *work-of-artist* in the 1976 performance is supplanted by the actualised artwork.

In equating instruction to *indication* in this way, there is a risk of casting Heidegger as a linguistic idealist and reducing everything to a function

of language.[104] Indeed this is a crude example of formal indication intended only to clarify the argument, not define the term. However, following Matthew Shockey, I argue that because *indication* is always tied to "the being of the one doing the indicating", it is always "brought to language without being initially predetermined by it" (528). However, I also reject Shockey's assertion that formal indication should not to be taken as anything other than a philosophical method based on both Heidegger's evocations of it with regards to *The Origin of the Work of Art,* and on Shockey's own positioning of *Dasein* in regard to formal indication. Rather, what defines an instruction's ability to operate as a formal indication is an essential acknowledgement of the *being* of the entity who will be enacting it. This, then, is where we can clearly see the distinction between the 1976 and 2015 versions of *News.* Allen is ontologically committed to the action, in that his *Being* is active in asking the question. Harvey, on the other hand, is not ontologically committed to the becoming of the work in the same way. Rather his commitment is to the linguistic preconception of the work as reenactment, from which the work itself "cannot stand forth out of concealedness" as the *work-of-art* – as knowledge (Heidegger, *Origin of the Work of Art* 50).

Beyond the direct comparison of these two performances, we should also consider the specific nature of the interaction between the artist and the newspaper with regard to formal indication. If formal indication is operative as an artistic method beyond performance – as a method of communication rather than production – then we need to understand how the newspaper itself might perform an indicative function. Recalling the earlier question regarding the extent to which formal indication can be taken as method for artist production, we should again ask who or what is the indicative agent in the interaction between artist and material? Whilst the self-instruction has been framed as a formal indication, it is clear that within the event of the work itself there is a more reciprocal interaction occurring.

As the artist crumples up and flattens out the newspaper, it gradually begins to disintegrate – shreds of now illegible text dropping to the floor. This transformation is the newspaper's material response to the actions of the artist, but at the same time the effect of the action on the material is in part determined by the nature of the material. If the same action was undertaken with a sheet of plastic, then it would not respond in the same way. Speculatively suspending our correlational assumptions here, we might consider this as a material response to the indicative function of the action.[105] The action suggests a certain way for the material to behave and, depending on the material, recreates with a corresponding indication. This reading is consistent with Bolt's explication of Haraway's construct of the *material-semiotic-actor,* and also helps posit *material thinking* as a "dynamism, the outcomes of which cannot be known in advance" (Carter, *Material Thinking* 3). However, unlike both Bolt and Carter, who seem happy to accept the entanglement of this dynamic without further scrutiny, I propose that the artist-material interaction described above is a reciprocal formal indication in which – paraphrasing Heidegger again – neither the artist or material is without each other. The artist's actions serve as formal indication to the material, and the material responds through its inherent physical properties.

Such a proposition is, of course, a departure from Heidegger's understanding of formal indication as a philosophical mode of inquiry inherently linked to the human qualities of *dasein* (Dalsthrom), and should definitely not be taken as a suggestion that materials engage in philosophical thinking.[106] How, then, can the extension of formal indication to non-human agents be justified? Taking each word in isolation, there is relatively little problem with accepting the notion that things 'indicate'. While this is the basis of the preceding argument, it is also apparent in Heidegger's rather crude example of a car indicator (*Being and Time* 107-114). However, it is very clear here that what he means by indicating is different from signification. Indication is not a matter of one thing standing in for another; it is derived from

Zuhandenheit – the ready-to-handness of the indicator.[107] It is predicated on the relational existence of the human being it is indicating to. In the case of the newspaper, its indicative function is only realised when it is picked up by the artist.[108] Indicating is "if we take it as formally as possible, a *relating"*(*Being and Time*108). In this sense it is clear that material, for Heidegger, can operate as a non-semantic indicator.

The term *formal,* on the other hand, is more problematic because of its implicit acknowledgement of the facticial[109] existence of the indicative agent – thus the privileged phenomenological function of *dasein*. As Heidegger explains in *The Fundamental Concepts of Metaphysics,* inanimate things such as stones – or perhaps newspapers – are *worldless* because "in its being a stone it has no possible access to anything else around it" (*Fundamental Concepts* 196-197). Thus being 'without a world', it is implicitly denied facticial existence of itself. This, then, is a limitation of Heidegger's conception of formal indication that has been exposed by separating the work-of-art into its constituent parts*;* Formal Indication is phenomenologically constrained by its inability to conceive of a non-anthropocentric ontology though its insistence on privileging *Dasein*. We can move beyond this limitation to conceive of a non-anthropocentric *formal,* towards what we might, following Karen Barad, understand as an 'agential' formalism, in which the emphasis shifts from material things to relationships. If we do so, it *might* then be possible to pursue an ontology in which the *thing-in-itself* – the differentiated digital can be taken as relational rather than material.

Without resolving this, the *formal* will always be conditional upon constructs of empirical logic that manifest as linguistic semantic propositions and negate the potential of material assertions of knowledge such as those that proposed by *Material Thinking*. Thus reduced to semantics, materials are once again purely a subject of *Dasein.* Operating as merely signifying constructs, such semantic methods inherently deny access to *the-thing-itself* and thus to the digital.

While *Material Thinking* in its current form fails to resolve this problem, and struggles to extricate itself from the entrenched semiotic reductionist models of knowledge it critiques, we will for now accept the proposition Carter put forward, that materials operate *formally* through a semiotic excess of materiality that exceeds signification ("Interest: Ethics of Invention" 15-16). By this, Carter is taken to mean that when materials appear to us in an ambiguous state they have become decontextualised, and that in this decontextualised state they promote a re-contextualisation in which new associations and meanings promote themselves – they become *formal* by virtue of their material facticity. While this explanation is sufficient to allow us to proceed, it will be necessary to revisit the problematic question of *formal* indications' anthropocentric tendencies once we have addressed the issue of the audience and the artwork.

9.2.3 **The work-of-the-audience**

While the argument has focused on formal indication *as* a discrete method in terms of the *production* of art, it remains to be shown how this method operates with regard to an audience's engagement with an artwork – what was defined earlier as the *work-of-the-audience*. It is important to do this because of its implications for the communicability of knowledge, and because it further informs our understanding of *digital* practice.

With perhaps the exception of Carter's material thinking, practice-led terminology has become the prominent term for describing artistic research methods (Haseman 148).[110] Despite its own doctrine regarding the agency of materials, material thinking remains fixated on the handwork of the artist as the 'author's knowledge'.[111] If we are to pursue a form of knowledge production situated in the method of formal indication, then it is necessary to leave behind such author-centric

dogma. Thus, with regard to the *work-of-the-audience,* it is curiously more relevant to articulate the methodological framework around what is understood as *practice-based* methods – methods which, following Frayling, Linda Candy defines as being more concerned with the creative artefact as the basis of the contribution to knowledge (3). It is this implied communicative function that makes *practice-based* research problematic in terms of relativist constructs of knowledge that – inverting Heidegger – strive to hold something other than the unknown accountable for what is known,[112] and that insist on pursuing a singular objectivity. If *practice-led* research is taken as approaching practice as a practised-subject in need of reflexive explication,[113] then the orientation of *practice-based* research is toward the communicative and relational agency of the artifactual outcome of practice. Thus the term *practice-based* is used here in order to ask: in what ways does formal indication serve as a viable communicative method in regard to the artefact?

In addressing the question of the audience and communicability with regard to formal indication, it is worth recapping the points made regarding the *work-of-the-artist*. The argument made is that as a method of un-concealing knowledge,[114] through the handwork of the artist, formal indication bears similarities to Carter's *Material Thinking*. However, formal indication is more specific in that it identifies the explicit dynamic between materials, processes and artist as being a relational knowledge event in which artwork and artists are contingent upon each other. As such, *indication* is inherent in relation and is understood as applicable to both human and non-human agents. [115]

The task here, then, is to address the problems that arise in positioning formal indication as a communicative method. By further highlighting these problems in terms of Haraway and Heidiegger's meta-objective frameworks, some of the limitations of *practice-led* research with regards to the constitution of knowledge will be identified. This in turn also clarifies the methodological stance of this thesis, that knowledge needs be

practically realised in the *being* of artwork-audience relations, not just in the *work-of-the-artist*.

9.2.3.1 **Leading Practices**

Given the level of abstraction involved in the construct of formal indication, it could be assumed that the artwork-audience relation might mirror that of the artist and artwork. However, in the practice of *making* art, indicative agency is realised though the handwork (techne) of the artist. While Heidegger reminds us that *indication* is inextricably linked to the practice of events, he also asserts that *making* is not to be taken as the activity of handwork itself. Yet neither is it without handlability. Neither is without the other. Thus in terms of artwork-audience relations, where there is typically no practice of the hand as such, it might reasonably be assumed that formal indication is not instrumental. This would mean that knowledge – in the terms defined – cannot be brought forth by art-audience relations that consist only of an objective subject-object dynamic. In such cases there can be no unconcealing, only understanding, because between artwork and audience there is no point of entry into the hermeneutic circle via handwork (techne). Forced to 'hold' the artwork at arms length, the audience can do nothing but 'observe' it from the 'god-position' of objectivity – a position that, as Haraway reminds us, we have mistaken for creativity and knowledge ("Situated Knowledges" 587).

Reduced to the status of a passive subject, artefacts thus become suspect as the basis of a contribution to knowledge, because any knowledge that is derived from them is attributed to the agency of the audience – in which case it is the audience who is seen to be subjectively commissioning knowledge, rather than the artist. The inadequacy of the artefact, in terms of verifying any claims to knowledge made by the artist/researcher, then requires explication – a

function typically assumed by the exegesis in *practice-led* research. If formal indication is shown to be non-operative in artwork-audience relations, then the reflexive explication of *practice-led* artefacts appears necessary to objectively validating artworks as research.

The failing of the *practice-led* approach is that, in such explication, the *work-of-art* is represented rather than realised. It is, to use Heidegger's term, 'enframed' by the reductive tendency of objectivity. Such enframing denies the potential of art to operate indicatively – to be part of the relationality through which knowledge is brought forth. While Heidegger develops the nature of enframing though his critique of technology, he is also clear that it is not limited to technology but is a more general "way in which the real reveals itself as standing-reserve" (*The Question Concerning Technology* 23). *Standing-reserve* is the way in which the framing of things inherently structures things so that they are no longer revealed as things-in-themselves – they are ready-at-hand rather than present-at-hand. Thus we can understand enframing as the imposition of a particular structure onto a subject.[116] "Enframing is the gathering together that belongs to that setting-upon which sets upon man and puts him in the position to reveal the real, in the mode of ordering, as standing-reserve" (Heidegger, *The Question Concerning Technology* 24). The meta-tendency of the exegesis is to enframe practice.

In Haraway's terms, the enframing of practice is understood as an "instrument of vision: an optics of political positioning" that places practice within the established structures of academic research. As such, the sort of reflexive explication promoted by *practice-led* research is an obstruction to the production of knowledge as a bringing-forth out of the essence of the relationship between artwork and audience. "Enframing conceals the revealing which, in the sense of *poiesis*, lets presences come forth into appearance" (*The Question Concerning Technology* 27). Whilst it might be argued that any visioning is an enframing, and

therefore formal indication is no better than anything else, this is a misunderstanding of the methodological function of formal indication.[117] Like 'situated knowledge' in formal indication, there is no subject of knowledge to enframe.[118] There is only knowledge *in* the relations between things, not of things. Knowledge emerges as the thing-in-itself, providing it is not subject to the enframing practice of explication. Here, then, there is another point of difference between Heidegger and Haraway. For Heidegger, knowledge comes forth in the constant becoming of Dasein, whereas for Haraway "situated-knowledge" is diffractive in its construction of knowledge.[119]

Bolt further emphasises this tendency of practice-led research to enframe art when she distinguishes between the artwork and *work-of-art*: "We can identify artworks, classify them, interpret them and make evaluations according to criteria established by the discipline of Art History. We can exhibit artworks and study the reception of them. However, does this allow us to get any closer to the 'work of art'? (Bolt, *Art beyond Representation* 5). Bolt is instructive here, not only in that she confirms the arguments made above, but also because she extends the problem of enframement to the representation of art by other practices. "In this representationalist world, there is a separation of subject from the object of research" (*Art beyond Representation* 7). In fact, Bolt's thesis is that it is necessary to go beyond representation towards a "performative logic of practice" (*Art beyond Representation* 8). Although it is not necessary to expand on this fully here, it does again serve to highlight not only the problem of representation, but also the difficulty of articulating the digital through any means other than its own becoming: to speak of a *thing-in-itself* is to conceal that thing itself through representation.

We do, however, need to be cautious here so as not to twist Heidegger's words to our own ends, in order to build a case for practice as that through which knowledge is both formulated and communicated. Bolt's argument, as compelling as it is, largely reflects Heidegger's early

thinking, before what he termed the *Kehre* – the *Turn*.[120] Although Heidegger wrote about this change in position, there are still different interpretations about its implications. I will not attempt to unpack those here, but do want to qualify my use of Bolt's argument against representation as it is affected by this. The *Turn* is a change in thinking about the reciprocity between human *being* and the world (Sheehan *The Turn*). Central to this is a shift in the way that language and *being* interrelate. It is clear from various accounts that, while Heidegger forges a new connection between language and *being* when he says "language *speaks*", this is not a total abandonment of his core ontological thesis of *being* in which *Being* is a priori to language (*Poetry, Language, Thought* 187-208*)*. Rather, as Cristina Lafont asserts, it is a structural problem that is inherent in *Being and Time,* one which is intended to demonstrate the connection between discourse, understanding and intelligibility (161; 63). Unfortunately, Heidegger's phrase 'language speaks', is not very helpful in clarifying this. As explained by both Lafont and Sheehan, this phrase is intended as a shift in emphasis, not a recanting of the ontological primacy of *Being*. Language and representation are made possible by *Being* in the shared discourse of the world (Lafont; Sheehan *The Turn*). Even after *The Turn,* for Heidegger representation is not that which precedes *Being*. So when Heidegger says 'language points', he is not deferring indicative function to language itself as that which brings forth. Rather, I assert, he is maintaining the position that it is through formal indication that we are thrown into the unconcealing of knowledge, in which language, like indication, always occurs in the relationality of the world. Thus Bolt's interpretation of Heidegger with regard to language and representation is upheld, and we can return to the troublesome issue of how knowledge is manifest in the artwork-audience relations.

9.2.3.2 **Reading News**

In the sense that 'news' – as derived from the French *nouveau* (new) – refers to the coming into existence of both people and things,[121] the title of Allen's work *News* pushes us beyond objective interpretations of it, to ask how *new* knowledge is situated in it. Is news objectively new in and of itself, or is it subjectively new news for the reader?

The title of Allen's work is a little tricky here. As an analogy for the constitution of knowledge, it helpfully condenses the artist, artwork and audience all into a single event that articulates the complexity of how formal indication operates across multiple situated levels. But it also highlights the hermeneutic difficulties raised with regard to language and representation, and the communicability of knowledge – even if it is old news. If we are to take this work as new *news,* then who is it new for, and what is the news of? As suggested earlier, this is the difficulty with Harvey's reenactment – it was old news.[122] But my purpose here is not to unravel that further, but rather, I want to understand how the audience is situated in the constitution of new knowledge. If we accept Heidegger's proposition that knowledge is brought forth out of unconcealment – a process through which it might be considered as *new(s)* – then how does the audience participate in that becoming if the signifying object is semiotically constrained? How does the audience read *News* without objectifying it?

Because formal indication necessitates some form of handlability to enable a conjunctive material revealing of knowledge, then an obvious solution is to literally give the audience a *hand* in the work: give them some practicable way in which to partake in the revealing of knowledge with the artwork, such that in what emerges as the work of art, neither is without the other. While Allen never hands the newspaper over to the audience in *News,* this is a strategy central to his *Tribute to Hone Tuwhare* (1969). Reconstructed in 2010, the work consists of three implied cubic

volumes, each approximately two metres, aligned one after the other; the central one being an inflated PVC cube, while on either side suspended from a grid and illuminated from above dense strands of nylon filament fall to just above the ground. In one of these, the nylon is interspersed with strips of paper inscribed with text from a poem by Hone Tuwhare.[123] Allen's intent here is clear, if through nothing other than the poem's title – *Thine own hands have fashioned* (1957) *(*Tuwhare 34-35*)*. Expanding on this in a recent video interview, Allen explains that his intention was to place the words in the hands of the audience – by asking them to "get inside the installation and actually run the poem through their hands" (*Interview with Jim Allen*). The rather literal inference taken here is that the 'reading' of the work-of-art is embedded in the practice of running paper though one's hands in such a way that the text is spatially reconstructed by the participation of the audience. However, Allen is also very clear that he was concerned not just with reading the text, but reading it in such a way that body was instrumental in its composition as the audience moves from one strip of paper to the next.

In comparison to *News* where the artist-audience relation serves as a *formally indicative* method in the production of the work, in *Tribute to Hone Tuwhare* Allen replaces his own handling of the paper with that of the audience. If we can make such an analogy, the decomposition of the work in the hands of the artist is paralleled by the composition of it in the hands of the audience. Through this simple act the audience becomes formally embedded in the indicative practice of the work, such that neither the artefact nor the audience can be separated from each other. In this sense we might say that the work-of the-audience is to practise the work-of-art.

While this literal example of formal indication being placed in the hands of the audience is helpful to make the point clear, it is of course overly simplistic. Obviously there are subtler ways in which audience-artwork relations can function as a formal indicative method. Allen was perhaps

aware of a need for less literal methods, as suggested by his desire to "bring in the rest of the body" through the use of nylon filaments and other tactile elements (*Interview with Jim Allen*). Although a far cry from the "total installation" discussed by Bishop,[124] Allen goes on to say that he wanted to "wrap the whole body in the work" and have people "get inside the installation" ("Installation Art" 14; "Interview with Jim Allen"). For a work of this limited scale this is a rather ambitious claim to make, as each cubic volume of the work barely extends beyond the dimension of the body. Thus it is necessary to consider these comments in context of the exhibition as a whole which – in the 1969 format – embraced a number of works as a single piece ("Interview with Jim Allen").[125] The inference is that Allen sees the body as being implicit in revealing the installation in the same way that the hand reveals the text. In navigating the installation, the audience assembles the work, perhaps even 'collaging' it together as they go. There is no single artefact; the artefact is the emergent realisation of the work in the 'hands' of the audience. Allen, of course, was not the first to employ this type of strategy.[126] Indeed, the 2010 exhibition *Points of Contact* is an implicit acknowledgment of Hélio Oiticica's influence on Allen in regards to the audience's participatory penetration of installation space (Cann; Bishop "Installation Art" 63). However, as Brian O'Doherty argues in his critique of the White Cube, such strategies took on new significance with the advent of Kaprow's *Happenings* in the 1950/60s.[127] It is not so much the gallery space that I want to engage here as the body within the space of the installation – although admittedly the boundary is blurred. For this reason the focus here is specifically on O'Doherty's *The Eye and the Spectator*, through which, in making reference to Kaprow's 1961 Happening, *Words,*[128] sets up a binary tension between the modernist *Eye* and the postmodern *Spectator*. Each, O'Doherty argues, contests knowledge of the artwork though different perceptions of it in regard to space – the *Eye* as an objectifying knowing that holds the-work-of-art at arm's length in order to analyse and reflect on it. Almost echoing Heidegger, O'Doherty asserts that the blocking function of objective

knowing – the *Eye* – makes us "feel like we can no longer experience anything if we don't alienate it first" (52). In contrast, the *Spectator* inhabits the space and 'feels' the work "making possible such experience as we are *allowed* to have" (O'Doherty 61) – *allowed* to have because the *Spectator* passively "sits on command" as "art conjugates him" (39-40).

All metaphors aside, the point is clear: that the viewer with 'his' disembodied Eye sees the work with a particular institutionalised vision[129]; whereas the *Spectator* is blind to everything but their own embodied experience.[130] "The Eye and the Spectator stand for that process, which continually restates the paradoxes of consciousness" (O'Doherty 1). Perhaps predictably given the time of writing, O'Doherty's solution to this paradox is the mind: the mind of "hard-core Conceptualism" that "identifies the *Spectator* with the artist and the artist with art", thus mediating between the two (64).

While these dualisms are not especially helpful here, there is clear relevance in the argument that supports our reading of Allen's intentions towards his audience. O'Doherty is also helpful in that he contextualises the changing role of the audience in relation to well known concerns about the nature of gallery space. The point to make here, however, is that the audience's body – not just their disembodied aesthetic and objectifying eye – is an essential part of gaining knowledge of the artwork. To assume otherwise would be to place the audience in the installation/exhibition without a body, perpetuating Descartian dualities and privileging the assumed objectivity of the institutionalised eye. The act of seeing, be it in a white cube or otherwise, is embodied, therefore seeing is as much a practicable action as handling.
O'Doherty's *Eye* is like the disembodied objectivity of Max Headroom reductionism that, as Haraway observes, "doesn't have a body; therefore, [he] alone *sees* everything…" (*Situated Knowledges* 575). However, rather than slipping into a dualist oppositional response as

O'Doherty does, Haraway avoids the singular pitfalls of both *Spectator* and *Eye by* insisting "on the embodied nature of *all* vision and so reclaim[s] the sensory system that has been used to signify a leap out of the marked body and into a conquering gaze of nowhere" (*Situated Knowledges* 581; my emphasis). Through the assertion of *all* vision, Haraway rescues the hands of Allen's audience from the susceptibility of subjectivity. She shows a way of thinking through formal indication as a science of becoming that opposes singular constructs of knowledge by proclaiming situated knowledges "where partiality and not universality is the condition of being heard to make rational knowledge claims" (*Situated Knowledges* 589). Only by holding on to the singularity of an absolute knowledge does the singular dogma of academic knowledge remain viable.

So when we speak of artwork-audience relations in regard to formal indication as a method of knowledge production, it is important to acknowledge that this is a singularity of multiple positions that relationally constitute situated knowledge. In the 'hands' of the audience the work is practice, not necessarily through direct physical engagement with the artwork but through being in embodied relation to it, such that the audience is the origin of the artwork and the artwork is the origin of the audience and "neither is without the other" (Heidegger *Origin of the Work of Art* 1).

9.2.4 **Artwork**

Having established the terms by which formal indication provides a viable method for realising discrete forms of practice by both artist and audience, the question of the factitial existence of the artwork arises once again. If, as signalled earlier, the totality of the *what, how*, artwork, artist and audience interactions forms the totality of the *work-of-art*, then how is the artwork itself positioned as an actant in the unconcealment of

the *work-of-art*?[131] This mereological question returns us to the hiatus of the term *formal* with regard to the factitial existence of the inanimate beings which – in being without a world – are incapable of accessing anything around them and therefore are not taken as *formal*. As noted before, this appears to be a phenomenological constraint of Heidegger's conception of formal indication.

The problem with this restriction is that it insists on a subject – one that only exists phenomenologically at the bequest of the artist or audience. In terms of a discrete method, such an ontology demands that an objectifying *Eye* acknowledge a subject outside of its own being and, in doing so, it negates differentiation. Seen as a transcendent 'god-trick', this position also obstructs the self-realisation of knowledge, as discussed. Given that the whole purpose of evoking formal indication here in the first place was to avoid this methodological conundrum, it seems we have reached a methodological impasse, or at least a point of departure from Heidegger.
It is here, then, that we must do away with the contrivance of discussing the *work-of-art* by breaking it down into constituent parts – the *artwork,* artist and audience – and resolve the formal potential of the artwork by focusing on the interconnectedness of the *proposition presented by 'when art is'*.[132] Maintaining the contextual reference point of Post-object Art, Conceptual Art's attempted *dematerialisation* of the *artwork* might then be useful as a point of departure to consider the implications that performative methods have on the formal function of artefacts.

9.2.4.1 **The work of this artefact**

In as much as Allen's Post-object work is seen as being affiliated to Conceptual Art, we might also consider it to be 'dematerialized'. This rather loaded term is, of course, indebted to Lucy Lippard and John Chandler who, in 1968, argued that in Conceptual Art, the material is

negated ("Dematerialization of Art"). It is not necessary, nor is there space, to recount that history here, or to revisit the arguments that ensue, but rather, my purpose is to explore the methodological implications of eliminating the inanimate material artefact. Of course, the first thing to acknowledge is that Post-object artworks – like many other forms of work that come under the broad banner of Conceptual Art – never completely did away with the object, as Lippard suggested was possible in the 1960s.[133] Despite its commitment to the immediacy of the 'real', and its performative tendencies, the object in Post-object Art remained operative as a semantic agent in most works.[134] While various Post-object Art practitioners moved into performance and new media fields,[135] the dematerialised post-object remained committed to the primacy of the *idea* rather than to a task of physically negating material form (Lippard, *Six Years* vii). It was never the explicit aim of Post-object Art to do away with the object, even if, as Barton asserts, it was in part a "rejection of the art object as commodity" (*Post-Object Art* 8).

Post-object Art – like other so-called dematerialised practices – was subject to many of the same issues of commodification that subsequently saw it co-opted into the art world as artefacts in the form of documentation.[136] Such documentation and ephemera have, of course, become de facto works in the absence of other material artefacts. Recalling the critique of Harvey's reenactment of *News,* we are reminded that, following Heidegger, the documentary function of such representations has the effect of obstructing the production of knowledge and runs contrary to formal indication's potential to discretely realise *the digital*. Beyond the problematic issues of documentation, Dorothea von Hantelmann also points out, the prospect of dematerialisation is questionable in the first place, given that art by definition necessitates some form of mediating artefact.[137] Thus, she says, "a truly dematerialized artwork has never existed and cannot exist…" (*How to Do Things*). As getting rid of material form has proven to be historically ineffectual and axiomatically contradictory, it seems

necessary to stick with the question of the material artefact and try to understand in what other ways it might be possible to consider material objects as possessing *formal* facticity.

The persistent nature of materiality is brought into question by Tino Sehgal's work which, being resolutely without artefact, has been discussed in terms of 1960s dematerialisation.[138] As von Hantelmann describes; "[…] in the work of Tino Sehgal there are no objects. His work is realised as actions, as movement and talking; the only material support they require is the human body" (*How to Do Things*). Very much like the body in Post-object or Conceptual Art practices, the 'performers' or 'interpreters', as Sehgal prefers to call them, operate within a script provided by the artist. This script governs the interpreter's interactions with gallery visitors, but also allows them latitude to improvise within it. Despite similarities, Sehgal is adamant about the distinctions between his 'sculptural' work and Conceptual Art's dematerialised legacy. The basis of this distinction is the difference between dematerialisation and *deproduction* – the simultaneous materialisation and dematerialisation of the work. Whereas 'dematerialisation' was conceptually motivated by the desire to transcend the object and 'opt-out' of the art world's economic structures, *deproduction* is invested in those structures to give material form to the work. As Sehgal explains: 'Deproduction' in itself isn't of particular interest to me but the simultaneity of production and deproduction is" (218). On the basis of this, Sehgal asserts that his work – which conforms to standard gallery hours and operating within the temporal terms of the visual-art exhibition – should not be read as performance, as this involves interpersonal, temporarily defined representations. In contrast, Sehgal's work is "always there, like another artwork" (218).[139]

While *deproduction's* accreditation of production helps define Sehgal's work as 'sculptural', its visual arts status is also informed by the definition of performativity developed by Judith Butler from the linguistic theories of

John L. Austin (*Excitable Speech*). However, as Bolt points out in her discussion of performativity in art research, while Butler's work has inspired Performance and Theatre Studies, the understanding of it as a methodological tool for artistic research is still largely based on Butler's arguments, not all of which are relevant to a visual arts context (Bolt, "Artistic Research: A Performative Paradigm" 133).[140] Bolt also acknowledges the significance of the work done by von Hantelmann's in this regard, of particular relevance here as it focuses more on the performative function of the artwork than the performative act of its production. However, the basis of the distinction that Butler makes between performance and performativity remains applicable: "The former presumes a subject, but the latter contests the very notion of the subject" (Osborne 33). As von Hantelmann clarifies, performativity should not be taken as meaning that something is 'performance-like'; rather it should be seen as indicative of a "shift from what an artwork depicts and represents to the effects and experiences that it produces [...], from what it 'says' to what it 'does'" ("Experiential Turn" 1). The basis of this definition is that it is impossible to make clear distinctions between constative (reality-describing) performance and performative (reality-producing) actions.[141] Because actions are by definition performative, it is tautological to refer to performative actions as such. Von Hantelmann points out the useful absurdity of this definition in art practice; all art making has a reality-producing function which is to produce a reality-making 'experience' which itself is a performative act. What really defines performativity in a visual art context is, then, not just that it produces a thing, but that the thing which it produces is the subject of production ("The Experiential Turn" 1). In contemporary art, this is taken as a reflexive double action that emphasises the performative effect of the performative act that produces it.

This is the strange doubling effect that the *dematerialisation* of Sehgal's work realises. By removing the material artefact, the audience is confronted with the question of where the artwork is. "Where's the

product? When does it get reified?" (Sehgal 219). The response, of course, is in the performative experience of the work, of which the audience is the subject. It is this reflexivity that locates Sehgal's work within visual arts discourses. Sehgal's work is sculptural because, like both Post-object and Conceptual Art practices, it is performatively concerned with what the experience of it does, rather than what it represents. Allen's desire to have the audience 'get inside the installation' is then no less a performative method than Sehgal's – through their actions both audiences are responsible for the becoming of the work. Like Allen, Sehgal hands the work over to the audience in the sense that they are given agency in realising the work. It is not that Sehgal's audience is necessarily expected to do anything, as Allen's is, but simply that their presence itself produces the work. The artefact in this work is the audience who "is always confronted with him or herself, with his or her own presence in the situation, as something that matters, as something that influences and shapes this situation" (Sehgal 219).

9.2.4.2 **Formal Artefacts**

By locating the performative agency of the artwork with the audience, Sehgal poses an interesting question – one which von Hantelmann touches on when she acknowledges the tautology of the term performativity by arguing that "there is no performative artwork, because there is not non-performative art-work" (*How to Do Things*).[142] It would be a mistake to treat this statement superficially – because artworks are an artefact of the artist's performative act, art is by definition performative – although von Hantelmann does go on to state just that (*How to Do Things*). The more interesting question this statement raises is: where in the artefact is performativity situated? Sehgal and Allen are both clearly interested in locating the performative agency of the artwork in the audience. It is through the audience's performative act that the artwork is factitial. The facticity of artwork is no longer just the

performative artefact of the artist, but is also the result of the *work-of-the-audience*. While the artefact is performatively situated in the audience, the audience is also the constative subject – they are also that which might be described as being the artefact. As a *being* aware of its own existence in the world, the audience is inherently *formally* enabled. Thus, because the artifactual subject of the work is human, the artwork is imbued with *formal* qualities. This is the rather disconcerting position that Sehgal puts his audience in, and one has significant methodological implications.

In the performative doubling of the audience, Sehgal constructs a *formally indicative* artefact – one that is both capable of indicating, and has factitial existence in and of itself. In this we can reasonably say that performative artworks are *formally indicative* because they inherently involve a human agent, and that performativity is a method through which the artefact becomes a *formally indicative* agent.

If, however, we want to extend this logic to artworks in which the subject is not human – to so-called "material artefacts" – then we must ask not where but *how* is performativity situated in the artefact? Here it is helpful to return to Haraway's notion of *situated knowledge* with regard to vision. While there is little difficulty in understanding the performative handlability of Allen's *Tribute to Hone Tuwhare,* because of the direct physical involvement of the body in reading the text, it seems more challenging to suggest that the same logic can be extended to vision. But when Haraway reclaims the sensory system – and in particular vision – as being embodied, it is clear that vision is as much a performative method as touch because it, too, is reality-producing.

Following Austin: if saying things has a reality-producing performative function, then seeing things should also have a reality-producing effect; Austin's argument that words create reality though declarations such as 'I do' or 'I name', should be equally applicable to 'I see' (*How to Do*

Things with Words 235). As with speech, when we see things they come into existence not just for us but for others too.[143] Seeing is like speech; it does not assume truth, just existence.[144] Although in many instances seeing remains a subjective knowing, as a *situated knowledge* this does not diminish its value as a research method. In any case, seeing is as much a tool of objective methods as it is situated knowledge, one which Haraway points out is a 'god position' that makes claims to objective knowledge. Situated vision is necessarily embodied. In being embodied, it becomes performative in that it 'produces' that which it sees. Artefacts are performative because they become real to us through our bodies, regardless of what senses our body uses to materialise them.

This is not to say, however, that artefacts on their own are performative and therefore *formal*. Neither is it an adoption of an idealist or phenomenological position that posits the world as being conditional on our perception of it. Rather, it is to argue for a materiality of formally situated performativity, in which neither the artefact nor audience can be spectated from each other. Artworks themselves are formally satisfied by the *contingency* of *the-work-of-art* that is the performative (reality-producing) totality of the *what, how, artwork,* artist and audience interactions.

The emphasis placed on *contingency* here is significant because although these interactions, like quasi-objects*,* privilege relationality, they remain contingent upon reason – human *Being* as reason for being – as practised by either the artist or audience. As long as this correlation is maintained, the human contingency of *the-work-of-art* satisfies the formal needs of indication by providing sufficient cause. If this correlation contingency is called into question, then the *formal,* either as a condition of *Being* or as a method of logic, becomes problematic. However, as stated at the start of this Appendix, my purpose here is to position formal indication as a method with regard to art practice and the construction of knowledge. Thus the question of the contingency of *sufficient reason*

or *cause* remains open until it can be addressed more fully in Appendix 10.

9.2.4.3 **To be practised**

In setting out the terms for this discussion of formal indication, care has been taken to distinguish between 'participatory art' and the approach taken here in terms of the totality of artefact, artist and audience relations, termed the *work-of-art*.[145] However, it is also acknowledged that formal indication – interpreted here as a relational method – is similar to 'participatory art' in some ways, and in part, this comes about from the way that the *work-of-art* has been analysed. While the role of the artefact has been worked through here in terms of its relationship to the audience, its participatory function still warrants some further clarification, if for no other reason than because of the connection between 'participatory art' and 'interactive art', which is typically taken as involving so called digital technologies. Because of this, it is worth clarifying some distinctions between the type of interactions involved in formal indication, and how these are similar to, yet distinct from, interactive art.

While some of the points made here pertain to the definition of digital art established in Appendix 8, the focus in this Appendix has been *methodological* rather than ontological, although admittedly this is a distinction blurred by the theoretical position adopted. The clarification revolves around the question of what is to be practised – the artefact or the *work-of-art*?

A similar question is addressed by Nathaniel Stern in his work on interactive art and embodiment, although his aim and position are very different from mine. In asking, "How might the body's continuity, and its potential disruption, be attended, provoked and contextualised in

contemporary art?", Stern recognises that the body and the things it relates to are in a constant process of reforming themselves ("The Implicit Body" 233). As discussed earlier, this process involves the *always-going-on-ness* of bodies and artefacts staged within the artwork (Stern, *Interactive Art* 89). Stern understands this as part of an *implicit body* schema, but Sehgal might understand it as the process of *deproduction,* and Heidegger as a condition of *Dasein*. The *implicit body* is an unfolding of self which functions in a similar way to formal indications' performative reality producing function, in contrast to *constative* reality describing actions.

In a fundamental sense, Stern's approach corresponds with the methodological position taken here. However, Stern is committed from the outset to an investigation of 'interactive art' which, I argue, he treats in strictly technological terms (*Interactive Art* 6). Although Stern urges us to "forget technology and remember the body", he also limits his inquiry by defining interactive art and interactive installation as being "works of electronic and digital art that feature: various forms of sensors or cameras for input" (*Interactive Art* 6).[146] This narrow and rather limited reasoning seems to be derived from Brian Massumi's *inter-given* as the 'work' by which bodies become themselves. While this is not unreasonable, the problem is that Stern takes 'work' to mean physical activity, and thus he sees it as necessary to have people move in order to interact.

But, as already established with regard to *Material Thinking*, such present-at-hand interactions can become obstructive to the bringing forth into existence through the function of formal indication. When the body sees itself practising – as was discussed in regard to Harvey's reenactment of *News* – the body posits itself as a performer representing a practice. Confronted with this anxiety of representation, the body is no longer *per*formed as Stern would have us think; rather it is *pre*formed and already completely given.[147] I argue that there is no need for the audience to 'interactively' wave their hands around in order for art to

work. It is, I suggest, a technological assumption that the body needs to *per*form to the interactive system. In doing this, technology obscures the *work-of-art*.

The questions to ask in the context of interactive art are: when is the body not moving? When are we not in the state of becoming, of being thrown forward into ourselves? When is the work of the *work-of-art* not being performatively enacted by audience–artwork relations?[148] Bodies and objects work together. They work together by being in relation. Work is not done by the hand or the body per se; it is done by *Dasein* – being-there. Being-there with and in relation to the other: the audience to the artwork and the artwork to the audience. In relating, formal indication moves the body forward into the becoming of the work. As discussed through Serres, it is relationality that moves the body, not the other way.[149] Things are always in relation. However, they are not always becoming. Rather they need *cause* to bring them into being – into a differentiated being, through a specific relational method.

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[1] This footage is now available online at https://vimeo.com/29706398 (Dadson, *EARTHWORKS* 2012).
[2] Aotearoa is the Maori name for New Zealand.
[3] *Oscillon 40* (1952), can be taken here as representative of the series of similar images that Laposky produced during the 1950s and 60s.
[4] DAM is one of many current online media art histories which could have been used to define Laposky's work in this way.
[5] See 8.3
[6] See pages 10-11.
[7] The suggestion of a radically inclusive otherness is introduced here in order to signal a connection to the collapsing of difference found in Tristan Garcia's conception of 'compactness'. See Appendix 10.2.4. Seen through the lens of a common radical ontology, Post-object Art practices are seen to be consistent with the 'flat' – later defined as 'flush' – ontologies that are central to this thesis.
[8] Otto Beckmann, Mary Ellen Bute, and Herbert Franke also developed animations or images from analog oscilloscopes during the 1950s and 60s.

[9] Narrative which King attributes largely to the influence of Alfred Barr, the Founding Director of the Museum of Modern Art, (1929-943). Barr promoted a Eurocentric agenda premised on art historical genealogy from which two main streams followed Cubism and Fauvism (Barr 9).

[10] Paralleling Kant's use "logic to establish the limits of logic", Greenberg's adopts a formalist position in which self-criticality becomes the immanent mode of practice (Greenberg, "Modernist Painting" 85). Although not developed in this thesis multiple inferences can be taken here with regard the recursive problem of resolving differentiation through the practice of differentiation. Like the Kantian logic on which it is based, Greenbergian formalism becomes hermetically self-determining and thus paradoxically resist the dualism of objectivity typically needed to differentiate between things. While this clearly speaks back to issues of digital differentiation that were addressed in appendix 8, it also can be extended to inform the methods of knowledge production discussed in this appendix. But as well as raising questions about how practice is practiced, Greenberg's Kantian based formalism also locates formalism in regarded to correlational critiques discussed in appendix 10.

[11] Specifically, Schwab compares the works by Michael Noll's *Waveform* (1965), to those of Piet Mondrian and Bridget Riley.

[12] The Illinois Institute of Technology houses the archive of Laposky's work and contains more than 6000 photographic plates of which only 125 were ever presented. h

[13] A comparison which at best has been based on photographic images, images which if we want to be technically pedantic are themselves analog images of images produced on analog equipment.

[14] Schwab draws on Claude Shannon and Rudolf Arnheim to make this argument.

[15] A point that echoes Tristan Garcia's construct of the thing-in-itself. See 10.2.3.

[16] In reference to Goodman we might also add semantics and syntax, although these are not opposition in the same sense.

[17] Clearly the concept of algorithm as art has become or is in the process of becoming mainstreamed when there are galleries dedicated to collecting and exhibiting and archiving algorithms, major American museums hold research and development forums on them, and The Wall Street Journal runs articles promoting the algorithm as the next "Hot" thing (Hotz).

[18] See 8.8

[19] Already mentioned briefly in 7.1 with regard to Kay and 7.9 in regard to Goodman.

[20] Schwab draws specifically on Lucy Lippard and John Chandler's essay "The Dematerilization of Art".

[21] While this position is reinforced in Melissa Ragain's recent publication of Burnham's writings and interviews, in fact Donald Karshan's exhibition *Conceptual Art and Conceptual Aspects* occurred some seven months earlier.

[22] Cramer and Schwab's concentration on *Software* may be due to the fact that until Melissa Ragain's 2015 publication *Dissolved into Comprehension,* his texts were less readily available.

[23] *Towards a Post-Formalist Aesthetic* for example presents more of a Marxist critique of Formalist art than "Systems Aesthetics" (Ragain, *Dissolve into Comprehension* 110-114).

[24] Positioning Burnham against the self-determinacy of the formalist concerns noted in 9.1.2 (footnote 2), this also suggest that "Systems Aesthetics" is a shift away from the correlational determinacy of differentiation.

[25] The syntax of the work.

[26] Lilly's publication *Programming and Metaprogramming in the Human Biocomputer* was first published in Sept 1968 and thus predates Burnham's use of it in "Real Time Systems" *(1969)* by some sixteen months. However, it is possible that Burnham was exposed to Lilly's work in 1966 via a presentation Lilly made at the Jewish Theological Seminary as noted in the foreword of the second edition.

[27] "Art movements, significant stylistic trend, and the business promotional and archival structures" are all identified (Burnham, "Real Time Systems." 49).

[28] In "Systems Aesthetics", Robert Morris, Carl Andrea, Hans Haacke, Les Levine, Robert Smithson, Donald Judd are cited.

[29] Similar to the way in which Kay perceives the Monad. See 8.1.

[30] Dadson participated in Cardew's Scratch Orchestra while in the UK during the late 1960s.

[31] While the influence of John Cage's work on Cardew and Dadson must be acknowledged, as it is Dadson's work that is the subject under discussion, engagement with Cage's work is limited here.

[32] Already introduced as part of the discussion of representation in 7.5.1 Floridi's appears again in Appendix 10.

[33] According to Floridi this applies specifically to instructional information as opposed to factual information (*Information Philosophy: A Very Short Introduction* 34-35).

[34] This method of 'decoupling' semantics and syntax is in contrast with the concomitant nature of Goodman's *world-versioning.* Floridi's separation of subject and object necessitates representation which, with regard to the digital, is seen as being problematic.

[35] See 9.1.3

[36] Schwab draws directly on Shannon's construct of information redundancy (Schwab, "Early Computer Art" 30).
[37] Schwab argues that art criticism is not an appropriate method for understanding early computer art as it was largely produced by non-artists; whereas a historical method is relevant as it contextualises the work in the context of technological development ("Early Computer Art" 3).
[38] While Allen kept a diary of his time in the US during the 1968 tour and draws on details from this in his biography, there is no information available regarding Burnham's schedule during this time. I am fortunate to have had the opportunity to clarify issues with Allen; however, Burnham is in advanced stages of Alzheimer's. Based on Burnham's network it can reasonably be assumed that he saw certain events.
[39] In *Beyond Modern Sculpture* Burnham dedicates a chapter to light and includes an image of one of his works: *Two Four-Unit Modulator Tapes* (303).
[40] In interview with Tony Green, Allen refers to *we* thoughout the section covering his activities in Boston and New Haven. This I take to refer to Adrian Hall as it directly follows a discussion about him Allen (*Skin of Years* 102-105).
[41] A description of the work is provided by Allen in *Skin of Years* (42).
[42] The term 'self-metaprogram' is taken here form Jack Burnham. This concept is developed in 9.2.1. Burnham's original spelling is maintained.
[43] In the first iteration of 2011 reenactments at the Govett-Brewster the sections were separated by short intervals, whereas in the ArtSpace Auckland version they were staged on successive nights. This is commented on by Allen in *The Skin of Years* (277-278).
[44] The reference here is to the preparations for 2011 performance of *Contact* where, as part of the technical team, I observed Allen briefing the performers.
[45] This anti-representational stance is consistent with the critique of representation with regard to the digital, set out in Appendix 8.
[46] In cases such as post-digital, the reading of post- has shifted away from an after to a concurrency: to a change in the state of the subject rather than a temporality.
[47] From both the disciplines of Physics and Chemistry.
[48] We can see the connection here to Schrodinger's earlier thought experiment with a cat in a box, that illustrated the paradoxical entanglement of quantum superposition.
[49] Shannon entropy principle has been applied to both information theory and thermodynamics but is taken here with reference to information theory in which entropy is the measure (bits) of binary questions required to determine the content of an item of data.
[50] Again a reciprocity that mirrors the concatenation of Goodman's semantics and syntax.
[51] In the case of Dadson's *Earthworks* this operates at a number of levels both within the four-stage structure of the work – distribution, performance, evidence, compilation – and Post-object Art's meta-dialogue with the art world as framed by Allen and Wystan Curnow in the foreword of the seminal Post-Object Art publication *New Art: Some Recent New Zealand Sculpture and Post-object Art* (Dadson, in Allen and Curnow, *New Art*).
[52] The significance of this is developed further with regards to New Materialist relationality in Appendix 10.
[53] Environment is used by Burnham in "The Aesthetics of Intelligent Systems" (Ragain, "Dissolve into Comprehension" 144) and by Heidegger with reference to umwelt – the world around us (*Being and Time* 93).
[54] A deverbal noun is a noun derived from a verb.
[55] Burnham's systems aesthetics and formalist critique tended to "define the art object in Marxist material terms", a position which Ragain points out has "resonance with our current moment" – taken here as being in reference to New Media Art discourses ("Dissolved in to Comprehension").
[56] As an event *in* time. See being *in* time, 8.7.2.
[57] See 9.2.2.
[58] The issue of the withdrawal of objects is discussed with regard to Harman in 10.2.
[59] The fundamental limits of epistemology is a central theme of Appendix 10.
[60] It is important to stress that while this informs the practical method being sort it is only a partial solution to the problem of the in-itself due to inherent limitations of *Being*. The remainder of Appendix 9 operates within these limits to establish a methodological foundation, however, in Appendix 10 the contingency of *Being* is addressed to develop a method of practicing the digital without such limitations.
[61] In *Principles of Art History*, Heinrich Wolfflin formulated a reading of form and style using five paired opposites – linear v painterly, plane v recession, tectonic v a-tectonic, multiplicity v unity, absolute clarity v relative clarity. In comparing Krauss to Wolfflin, Burnham suggests that Krauss' conception of process art is simply a continuation of formalist values to which Burnham was opposed.
[62] Indeed, this is the issue problematised in Appendix 9.

[63] As Mathew Shockey notes, Heidegger does very little to define his use of this term ("What's Formal about Formal Indication?").

[64] See Streeter, "Heidegger's Formal Indication", and Dahlstom, "Heidegger's Method".

[65] See section 8.3.

[66] Heidegger himself uses the term *cognitive comportment* to describe the way formal indication brings us to objects ("Phenomenological Interpretations" 42).

[67] Heidegger derives this definition of truth from the Greek *aletheia (truth), which stems from letheia – "that which is 'not hidden or forgotten', or he who 'does not hide or forget'* (Inwood 13). Truth as aletheia is consistent with Latour's conception of subjective truth as discussed in 8.6.1, or a Goodman *world-version* as discussed in 8.4.

[68] This point is reflected in the interweaving narrative of this text which is intended to allow the reader to reveal what is indicated for themselves.

[69] Lammi identifies four issues; truth, method, origins of the work of art, and time. I take method and time as being instrumental in constitution of the other two, which I suggest result as a necessary outcome of them.

[70] This appears as "'Being that can be understood is language' to be read", in *Truth and Method* (470)

[71] This might also be defined as the distinction in Heidegger's thinking before and after the "turn", in that after Being and Time, Heidegger moves away from the precondition of hermeneutic phenomenology and becomes increasingly invested in the "fore-structures" of *Being*. This is analysed by Gadamer in *Truth and Method: The Hermeneutic Circle and the Problem of Prejudices* (268- 278).

[72] While facticity – the condition of fact – is generally contingent on human experience here, later in this text it is used in a non-correlational sense. This difference is discussed in 9.2.1.

[73] Facticity as the founding of sufficient reason – the given from which causation can be established – is taken here as the being of humans in the world. While the basis of facticity is not drawn into question here it becomes a significant issue when its presupposition is called into question in section 9.2.1.

[74] While I have used the collective term *fore-structure* here it should be noted that it is further defined as an interpretative structure founded on fore-having, fore-sight, and fore-conception (*Being and Time* 191).

[75] I note, with reference to subsequent critique, that this – the fore-structure of Dasein – is the inherent limitation of the digital in-itself.

[76] Gadamer's interpretation of *Bildung* – "The *concept of self-formation, education, or cultivation*" – is central to the formulation of his hermeneutic argument (8).

[77] Although formal indication will be further developed in its own terms in this Appendix, it will be subject to further refinement in Appendix 10, under the critique of non-correlational arguments. Without grounding the method of formal indication in this way, the more radical treatment of it proposed cannot be rigorously defended.

[78] Again, this is a limiting temporal contingency that will be addressed in Appendix 10.

[79] This tripartite constitution resembles the approach Bishop takes in *Installation Art: A Critical History*, in that it addresses *the-work-of-art* as a "single situation" (10). Installation and the position of the audience within it will be central to this discussion.

[80] The Humpty Dumpty principle is cited by Frayling, Michael Biggs and Daniela Buchler as being an argument that relies on changing the meaning of words to suit an argument being made ("Research in Art and Design"; "Eight Criteria"). As Frayling interprets this as a question of legitimisation ("Research in Art and Design". 2).

[81] *Practice as Research* (Barrett and Bolt); *Thinking though Art: Reflections on Art as Research* (Holdridge and MacLeod); *Art as Research: Opportunities and Challenges* (McNiff); *Practice as Research in the Arts* (Nelson).

[82] Publications on arts research typically base their arguments around the UK Higher Education Funding Council (HEFCE) definition of research for the Research Assessment Exercise (RAE), as exemplified by Stephen Scrivener: "The word "research" has become part of the artist's vocabulary and the art world has committed wholeheartedly to the competitions for research funds provided by the HEFCE and the Arts and Humanities Research Board" (2). The HEFCE defines research as "an original investigation undertaken in order to gain knowledge and understanding" (HEFCE) In addition to this, PhD research is typically cited as needing to demonstrate an understanding of "how its research contributes to knowledge, what kind of knowledge is produced" and "how these artefacts convey knowledge" (Scrivener 2).

[83] The use of verbal articulation as a metaphor is an acknowledgment of the function of Haraway's metaphor of vision, and that encompasses a paradoxical objectivity that is, like lipsyncing, both embodied and technologically objective ("Situated Knowledges" 581).

[84] Substituting art for science we can interpret Heidegger as reading: art "becomes research though the projected plan and through the securing of that plan in the rigor of procedure. Projection and rigor, however, first develop into what they are in method. The latter constitutes the second essential characteristic of research" (*Age of the World Picture* 60).

[85] It should also be noted that *Being and Time* and *The Basic Problems of Phenomenology* were first published twenty-three years before *Origin of the Work of Art*. In this sense, *Origin of the Work of Art* can be seen as a further refinement of Heidegger's central thesis.
[86] Although perhaps problematic in relation to material artefacts, the term 'audience' is used here precisely because of the performative associations it carries. Audience positions the artefact as event rather than thing.
[87] Although art here as it is with Goodman earlier is seen to embody core philosophical concerns, as prescribed by Heidegger art is not restricted to fine arts.
[88] While we are reminded here of the parallels between code and instruction in Burnham's work, the indicative function of instruction is also discussed later with regard to the work of Tino Sehgal.
[89] In fact, it could be argued that historically the intention was to conceal the function of that process.
[90] In English appearing as *techne*. The common translation of this into technique is inadequate and misses the nuance of the original term.
[91] In English ἀλήθεια appears as *alethea* meaning truth. Heidegger replaces this rather inadequate term with his own term *entbergen* – to unconceal. A definition has already been provided in 7.8.
[92] Recalling Heidegger's phenomenological affiliations.
[93] Paul Carter is the Creative Director of the Australia-based *Material Thinking* – a lab for analogical thinking that maintains the material thinking website: http://www.materialthinking.com.au A book with the same name, *Material Thinking,* was published in 2004.
[94] An independent journal, *Studies for Material Thinking*, has affiliations with Paul Carter and is based in New Zealand. It focuses on the critique of research from the vantage point of materiality and poiesis. https://www.materialthinking.org/people
[95] See Bolt's *Material Thinking and the Agency of Matter* and *A Non Standard Deviation* (2007).
[96] I have used the work techne here instead of the Greek Τέχνη so as to maintain continuity with the German *vorhandenenheit*. Bolt does not refer directly to *vorhandenenheit or the common translation of it 'present-at-hand',* using instead the term "handlability" ("Heidegger, Handlability" 2004).
[97] While these are seen as two key texts, the *Origin of the Work of Art* speaks more directly to the issues of concern here.
[98] It should be noted here that in this section we are talking about how the making of the work operates onto-epistemically. We are not addressing its communicability here. Thus the argument Bolt presents around reflexive writing is not applicable as this sits strictly outside the making process.
[99] This question is addressed in the following section.
[100] In Dadson's *Earthworks* this is evident in the independent observations made by participants at each of the globally discerned sites. In Allen's *Computer Dance,* the open-ended nature of the briefing given to participants affords agency within the metaprogram of the work as it emerges.
[101] In the sense of unconcealment.
[102] The interwoven narrative of this text attempts to put the reader in this position with regards to both the reading of this text and meta-text of Appendices of Catch | Bounce.
[103] The reenactment was presented at an Arts Foundation Icon Awards ceremony of which Allen was a recipient. The author was present at this performance. It should also be noted that Harvey also reenacted *News* in 2014, as part of a collaboration with Allen – *Jim Allen's News (2014)*. This exhibition also included two new works – *News Floor* and *News Wall*, in response to the original, which for reasons of conciseness are not discussed here. See http://www.circuit.org.nz/film/news-wall-0 and http://www.circuit.org.nz/film/news-floor-0
[104] See Richard Rorty – *In Defense of Eliminative Materialism*, 1970.
[105] In Appendix 10 this correlational assumption is developed further to 'speculatively' inform the method of indication.
[106] This point is made within the constraints of Heideggerian phenomenology and is not intended to infer that materials do not have agency which in other context might be considered as an undertaking of epistemic work.
[107] Also see 10.2 regarding ready-to-hand and causation.
[108] It is important to note the causal agency of the artist in indicative function, as this constraint is developed further in Appendix 10.
[109] Facticial is a Heidegarian neologism that means simply the state of "being-already-in a world" (*Being and Time* 293).
[110] While no doubt other possible terms could be put forward here, Brad Haseman points out that terms such as "'practice as research, 'practice based research, practice-integrated research, 'studio research'" have have not become as prominent as, 'practice-led research' (147).

[111] "In this relationship, materials are not passive resources to be used by humans in the shaping of an artwork, but rather there is a reciprocal inter-relation in which "we shape them as much as they shape us" (Bolt, *Heidegger Reframed* 154).
[112] The reference here is in contrast to Heidegger's definition of method as that which "accounts for something through something known, and at the same time confirms the known through that unknown" (*The Age of the World Picture* 61).
[113] A function typically performed by the exegesis.
[114] Where knowledge is understood as the revealing of the truth of *being* – ἀλήθεια.
[115] The term *Formal* on the other hand is more problematic as in Heideggarian terms it is strictly anthroprocentric. But for now we have accepted that materials operate *formally* through a semiotic double movement in which non-human things have *formal* properties.
[116] *Standing-reserve* is translated from the German *Bestand*, which in the sense Heidegger uses means to hold something in a stock of ordered resources. *Enframing* is translated from the German *Gestell* and is that which places things in order (Inwood).
[117] Formal indication as the instrument of *Being* is a method that evades linguistic hermeneutics.
[118] This is also key to understanding how Heidegger epistemologically evades subjectivity. As Francois Raffoul explains, "Dasein is not another word of either consciousness or subjectivity" (Raffoul 252).
[119] This point of difference will emerge again in Appendix 10 with regard to Barad where it will be used to inform vital materialism and 'agential realism'.
[120] The *Turn* is taken as occurring between the writing of *Being and Time* (1926) and the *Letters in Humanism* (1946). While it he uses it for different purposes in the terms addressed here, it is taken as a change in his thinking about Being and truth (Inwood 232-233).
[121] The Shorter Oxford English Dictionary defines new as "not existing before; now made" (Trumble, "New"). Etymologically derived from nouveau, new is applicable to both people and things (Trumble, "Nouveau").
[122] See 9.2.2.2.
[123] Of Ngapuhi descent, Tuwhare was a New Zealand poet whose writing address cross cultural vernacular post war issues. His first collection of his work was published in 1964.
[124] Bishop uses Ilya Kabakov's term "total installation" to enter a psychoanalytical account of installations. This is of little direct interest here in that its commitment to the psyche is secondary to relational concerns.
[125] The 1969 exhibition "Small Worlds: 5 Environmental Structures" included *Tribute to Hone Tuwhare, Small Worlds, Space Plane and Environment no.1*.
[126] Since Kurt Schwitters' *Merzbau* (1923-1937) sought to have "the spectator stand *'in'* a piece of sculpture", installation practices have sought to position the audience within the work as a participant ('German critic' as cited in Rosenberg 76).
[127] Bishop, while acknowledging the significance of Happenings in the 1950s, argues that installation art proper only arises in the 1970s and 1980s. However, like O'Doherty I see the critical realignment of the gallery space in the 1950/60s as signalling a more significant rethink of audience agency. This is discussed in more detail regarding Allan Kaprow in subappendix 3.
[128] *W*hich bears comparison to Allen's *Tribute to Hone Tuwhare* in more than just its use of text.
[129] In O'Doherty's argument this is the institutionalised White Cube.
[130] In *Algorithmic Offsets and Irreducible Formulas*, I use Samuel Beckett's *Film* (1965), as a way of exploring the agency of objects and our engagement with them. Beckett's use of the 'eye' of the camera speaks to the issue touched on here. See subappendix 1.
[131] The totality of the *work-of-art* can be seen here in the context of questions raised regarding Goodman's critique of set-theory. Despite Goodman's conception of *showing forth,* signalling an ontological turn that can be compared to Heidegger's *kehre (turn)*, he does not consider the mereological implication of this because only concrete entities are admitted as part ("Constructive Nominalism"). The question in regard to the totality of the *work-of-art* is then firstly a nominalogical one regarding the ontological status of relations. As argued with regard to Heidegger this ontological shift reframes mereology such that parts cannot be seen as separate from the event of their becoming (*Origin of the Work of Art* 1) See 9.2.2.1.
[132] This proposition refers us directly back to the point reached at the end of Appendix 8 regarding the *showing forth* as the 'how' of 'what' is. See 8.9.
[133] Dorothea von Hantelmann also makes this point in *How to Do Things With Art*: "Apart from very few exceptions, there has never been a 'dematerialization' of art" (ch 3).
[134] This is not meant to imply that Post-object Art was void of political motivation. But rather its anti-establishment art world tendencies were never as heightened as they were in the US (Lippard, *Six Years*), perhaps because of the limited scale of the New Zealand art market at the time.
[135] For example, Leon Narby into film and Dadson into sound art.
[136] Perhaps the ultimate acknowledgement of dematerialisation's 'failure' is the 1973 publication of *Six Years* – Lippard's own publication which serves as a reference book gathering together

ephemera from 1966 to 1972, and the 2013 exhibition "Materialising 'Six Years'", at the Brooklyn Museum (Lippard; Morris and Sacker). It is hard to see how the irony of valorising 'dematerialised' artefacts by such editorial and curatorial acts can have escaped either Lippard or the exhibition's curators Catherine Morris and Elizabeth Sackler. With regard to Post-object Art, we can cast the1998 exhibition "Action Replay: Post-Object Art" and its accompanying catalogue in the same light (Barton, "Te Ara").

[137] According to Hantelmann, even language performs such a constative materialising function as developed subsequently though Butler and Austin.

[138] While both Bishop and von Hantelmann raise the issue of dematerialisation with regard to Sehgal's work, Sehgal also frames the work in this way through the titling of works such as *Instead of allowing something to rise up to your face dancing bruce and dan and other things,* 2000, which makes direct reference to works by Bruce Naumann and Dan Graham.

[139] The work conforms to standard gallery hours but also exists as a commercial product that can be owned like another artwork (Sehgal).

[140] Bolt identifies the Deleuzian aspects of Butler's work regarding iteration and convention (*Artistic Research* 134).

[141] Theses terms derive from Austin's work on linguistics. I am subsuming language as a class of action here for clarity's sake. Austin illustrates this with the example of the effect that words like 'I pronounce you man and wife' have on reality. In many ways this is the same reality producing act that Duchamp's readymades pivot on. But the inverse is also true. As Martha Buskirk points out with regard to Robert Morris and *Statement of Aesthetic Withdrawal*, statement can also un-produce reality. So really what is meant is that performative acts are reality changing (2003).

[142] In Butler's terms, there is no outside.

[143] Seeing is easily mixed up with the notion "sense-data" which Austin subsequently develops (*How to Do Things*). Sense-data assumes a correlation of truth between what is seen and what is. Rather, what is meant here is that when something is seen it becomes known to be. In this sense, seeing is performative because it is reality-producing. For example, seeing a UFO does not mean that extraterrestrial spaceships exist any more than painting a unicorn means unicorns exist. (As discussed re Goodman and representation in 8.5.) It simply means that something came to be known to me as existing. Thus, while sense-data is correlational, seeing as described here is not.

[144] Taking this a little further we might reflect on Goodman's example of the Unicorn. Although never seen per se, the Unicorn comes into existence by means of a similar mechanism of construction that allows for abstract entities to be admitted into his nominalist system. See 8.5.

[145] The key distinction is with regard to social engagement. See section 9.2.2.

[146] Stern actively critiques a technologically determinant view of interactivity and argues for a focus on what the body does, but then distances himself from relational, situational and conceptual practices.

[147] While Stern draws on the Deleuzian notion of *preformism* here, more pertinently in terms of the stated limits of correlationism that will be addressed in Appendix 10, Barad provides a way of giving "matter its due as an active participant in the world's becoming…" though *agential realism* (Stern, "The Implicit Body" 233; Meeting the Universe Halfway 136).

[148] While we could extend this to include artist-artwork relations the focus here, following Stern, is on interactivity within audience-artwork relations.

[149] See 8.6.1.

Appendix 10 **What Matters**

10.1 **Forgotten Objects**

As if shaken by some internalised interference pattern, Richard Dupont's cast resin figure *Untitled (#5)* (2008), which features on the cover of the exhibition catalogue for *Out of Hand: Materialising the PostDigital*, epitomises the confusion that seems to surround populist conceptions of digital materiality in an arts context (Labaco). This work, like others produced by Dupont, is made by using software to manipulate 3D scans of the artist's body so that they can be 'digitally' distorted. In the case of *Untitled (#5),* the distortion has the appearance of passing an interference wave through the form. These computer models are then reproduced using traditional casting processes, and were presented in the exhibition "Out of Hand" as 'digitally materialised' sculpture (Labaco).

The suggestion presented by the title of the exhibition is that the digital somehow displaces the 'hand' in the production of this work – although both Dupont and Ron Labaco, the curator of the Museum of Art and Design exhibition, are quick to point out, with regard to many works that use digital technologies, nothing could be further from the case. [1] The hand is never 'out' of digital practice, although probably not in the way they intend. Nevertheless, the danger of titling exhibitions with catchy phrases such as *Out of Hand* as a means of promoting them as 'digital art' is clear[2]: all too easily it leads to misconceptions that reinforce the type of erroneous and dialectic readings of the digital, as discussed briefly in section 8.3.[3]

But the focus here should not be on limitations of the curatorial vision or, indeed, Dupont's work per se, but the state of ontological *inertia* that such readings infer on objects.[4] While this inertia seems to confound the tension between artefact and process by attempting to ontologically define artefacts in terms of process, it disregards *practice* as that which is omitted in the dialectics of artefact/process reasoning.[5] To put this in

Heideggerian terms, one could say that such dialectic reasoning is the result of "the abandonment of being by being" (Heidegger, *Contributions* 88).

However, to say 'abandonment' is perhaps to underestimate the all-inclusive nature of dialectics for, as Theodor Adorno tells us, in dialectics nothing is left out or unaccounted for, even that which has been abandoned. Self-evidently, everything is either A or *not-A*. This can also be expressed as A minus *not-A* = 0: a logic construct that we find encapsulated in the binary opposition of thesis and antithesis, of the Boolean true/false, the binary 0 and 1, and indeed the digital and the analog. Each element is defined by not being the other.[6] What Adorno argues in *Negative Dialectics* is that this reasoning always in fact leaves something out.[7] What is left out is neither A nor *not-A;* it is what is *not-not-A* – that which falls outside of the dialectic reasoning of artefact and process: practice.[8]

Negative Dialectics, on the other hand, provides a way of thinking about this *not-not-object*: the nothing that is neither object or not-object. No – less than nothing, because nothing is a something. It is a *non-identity* – a term Adorno offers an alternative to *identity thinking.*[9] Moreover, as Deborah Cook explains, *identity thinking* seeks to fit things to their concepts by subsuming them under systems of classification and representation. Thus, an object only is when it is identified by the subject classifying it. On the other hand, *non-identity thinking* seeks to "grasp the object by means of possibility to indicate what an object might become…" (Cook) – perhaps it could even be said that to think a non-identity is to *speculate* about the *unreasonable* way in which things might be different.[10] What artefact/process dialectics leave out is the ability to grasp what the object-artefact might be in the practice of becoming itself. 'Abandoned' in this way, objects are forgotten and left to subsist in a state of ontological inertia.[11]

Thus, while an artefact might have been made using a so-called 'digital' process, the *work-of-art* is not inherently digital as a consequence.[12] A thing is digital because of how *it* is differentiated in being or becoming in-itself. Artefacts such as *Untitled (#5)* are then mistakenly perceived as being digital because practice is confused with process, and process itself is misrepresented as being.[13] Thus, despite its means of production in the terms defined here, there is, I suggest, nothing digital about *Untitled (#5)*. The state of ontological inertia it exists in makes it difficult to forget 'it' – the object – and focus on the *not-not-it* of its practice. It is as if the erroneous facticity of it being 'digital' is constantly brought to hand without ever being ready-to-hand. In this inertia, there is no indication about the way in which practice might proceed. *Beyng* hesitates, and the object wavers. This ensuing stasis is not, however, the sort of productive entropic uncertainty that points to the emergent potential of *how*. This is *not* an ontology of *becoming* that energetically throws entities together to *bring-forth* knowledge; rather it is hesitancy in the face of dialectic determinacy that leaves something out: the possibility of the work being practice.

A useful way of thinking about this with regard to Adorno is as a 'message in a bottle' where "[t]he communication of artworks with what is external to them, with the world from which they blissfully or unhappily seal themselves off, occurs through non-communication…" (*Aesthetic Theory* 5). The message in the 'message in the bottle' is not whatever is written on the scrap of paper inside the bottle. It is in the inaccessibility of that message in the context of the uncertain tide it is thrown into. Its communicative potential lies in the practical possibility that it might be found, not in the declaration of what will be read. Extending this through a reading of Adorno, James Hellings suggests that there is no implicit certainty that the artist, as author of the message, knows what the message is, either (23-30). The art object emerges for artists, as much as for the audience, in the *possibility* of practice, not the realisation of it. The

uncertainty of this possibility is what makes objects negentropically hesitant.[14]

In *Untitled (#5)* there is no clear indication about how to proceed with the *work-of-art,* as the potential of relations is perceived as secondary to ontological facticity of audience and artefact, subject and object. Politely circling in dialectic servitude to the causal event of the artefact, subject and object engage in a familiar correlational refrain. Each deferring to the other as the point of entry to the hermeneutic circle, subject and object hesitate, abandoning the *work-of-art* and the *not-not-it* of practice to *identify thinking*. Obviously, this dithering should not be taken in the literal sense, as depicted by the wavering hand of *Untitled (#5)*. Rather, it should be understood in terms of the ontological condition of its becoming, which – being one of unconcealment and revelation in practice – manifests as the artefact's causal inability to escape its *ontocentric* tendencies; tendencies in which the *becoming* of the work is somehow trapped in the dialectic rational of material form without recourse to the *unreasonableness* of practice.[15]

The term *ontocentrism* is again an appropriation from Floridi, who uses it in *Information Philosophy* to argue for an ethics of information ("Global Information Ethics"). Although not irrelevant, these particular ethical motivations are not of direct concern here, and yet Floridi's approach is instructive as it results in a *basic* levelling of the ontological plane.[16] Such 'levelling' is seen as central to the development of a way out of the correlational limitations of dialectic reasoning that are currently frustrating the practice of *formal indication* as a differentiated in-itself.

Ontocentrism develops out of Floridi's argument for treating all entities as information, regardless of whether such entities are animals, plants, paintings, books, stars or stones ("Global Information Ethics" 15; Allo et al). In this sense, it represents a non-anthropocentric ontology. However, this ontocentric levelling is only partial, and it remains correlationally bound.

The anthropo-centric and anthropo-eccentric taxonomy it presents remain ontologically committed to being*s*: beings that Floridi calls 'patients', the "assets or 'corpus'" in an ecosystem ("Defence" 16). As long as such beings are bound together with agents in "ontic trust", ontocentrism remains steadfastly patient-oriented and beings-centric. In other words, while Information Philosophy is non-anthropocentric, it remains ontologically committed to objects, the so-called 'binding' of which is not itself afforded ontological equivalency. In this sense the ontological levelling that Floridi puts forward is subject to dialectic critique as developed in regard to the 'abandonment' of practise.

Following Adorno, while it can be argued that Information Philosophy promotes an ontological levelling of objects, it is also shown to 'forget' the *becoming* of subject-object relations. Adorno's position is subtly different in that it challenges the strict demarcation of subject and object by arguing that subjects are made real – hypostatized – by objects, rather than the other way around. Put simply: we do not perform objects; they perform us. The reason for this, he says, is that "objectivity can be conceived of without a subject; not so subjectivity without an object" ("Subject and Object" 501). While the prioritisation Adorno places on objects is not of particular relevance here, the recognition that subjects are performed or practised, is. Adorno, thus, not only identifies what is left out, but also recognises that things are made or become, in the practice of subject-object relations. This adds another dimension to the ontological levelling of Information Philosophy, which as Capurro points out, is quite different from the Heideggarian ontological commitment to *Beyng:* ontocentrism is beings-centic not beyng-centric ("Floridi's Metaphysical Foundation" 21). While conceding this point and acknowledging that the "Heideggerian perspective might be somehow enriching", Floridi marks the ontological distinction taken here as the cause for the ontological hesitancy evident in Dupont's sculpture ("Defence" 23). Beings without the relational *reason* to practice are not *beyng* in practice.

Untitled #5 is ontologically hesitant because the 'hand of the artist' and the invisible 'finger of the digital', each pointing in different directions, are confused about how to materialise *beyng* in practice. As a result, the ontological 'how' of the work – its *being* – is uncertain, even if its being is concrete: it is ontologically bereft of cause. In Appendix 9 the tension between substance and action was identified as being essential to maintaining the vitality of the work.[17] It was also suggested that the indicative potential of *Beyng* was limited by *Dasein's* anthropocentric tendencies.[18] Conceiving of Dunlop's work in *ontocentric* terms highlights that these two issues are not conditional on one another. This means that just because an artwork is non-anthroprocentically conceived, it does not follow that the vitality of the work is ensured. As stated earlier, without such vitality, subjects and objects are seen as secondary to the potential of their own relations. Such vitality requires reason – *sufficient reason* – but this is not evident in merely 'levelled' ontocentric ontologies, or indeed inherent in even flatter non-correlational ontologies. Thus, we need to develop a fuller understanding of non-correlational ontologies in order to address the hesitancy that is manifest in *Untitled #5,* as lacking *sufficient reason*.

Consideration of both Information Philosophy here, and more particularly Burnham's self-meta-programmes earlier, suggests that systems maintain themselves by reaching out or pointing to entropic disorder (negentropy) outside the system. What is described here as inertia is then really the result of the artworks' ontological inability to do this – to avoid reaching a state of inertia by allowing for the disorder or unreason of practice.[19] The so-far unchallenged assumption has been that, like water finding its own level, self-meta-programmes innately know how to do this and what to point to. Although the need to address this was signaled in Appendix 9, it was set aside so the basic construct of *formal indication* could be developed without further complication by correlational critique. The aim here, then, is to question the contingency of *sufficient reason* that has up until now been taken as given, and see if non-correlational

ontologies – collectively referred to here as Speculative Ontologies – are able to resolve the question of causation with regard to the event of the in-itself.

I frame this as an ontological problem not just because of the onto-epistemic context in which the argument has been developed, but also because ontology as a sub-field of metaphysics necessarily involves *some* recourse to the question of causation. Without it, the ontological 'stuff' of the world such as *Untitled (#5)*, just sits around inertly without there ever being a reason why anything should ever happen at all. Even so-called *vibrant* ontologies of *becoming* cannot, I suggest, avoid addressing this question. Thus, while causation is metaphysically implicit in ontology, not all ontologies have *sufficient reason*, or more formally – 'final cause' – "that for the sake for which a thing is" (Aristotle, *Metaphysics* 36). Of course, things can still *be* without sufficient reason, but to *indicate* in such a way that things are *brought forth* out of inertia requires something more.

10.2 **Cause Without Reason**

> Efficient causation is that kind of causation whereby the parts compose the whole; final causation is that kind of causation whereby the whole calls out its parts. Final causation without efficient causation is helpless; mere calling for parts is what a Hotspur, or any man, may do; but they will not come without efficient causation. Efficient causation without final causation, however, is worse than helpless, by far; it is mere chaos; and chaos is not even so much as chaos, without final causation; it is blank nothing. (Peirce 124)

To begin the process of examining *sufficient reason,* I want to return to Harman's reading of Heidegger that was touched on earlier,[20] and look

specifically at the way Harman attempts to develop "a new theory of causation" in support of Object Oriented Ontology. This will enable us to see how this differs from Heidegger's treatment of 'final cause' ("Time, Space, Essence").[21] Causation – taken here as the question of what motivates practice to be practiced – is approached in this way in order to ground some of the problems, albeit in a necessarily limited way, but also to provide a context for introducing other non-correlational causal propositions. Based on the correlational limitations discussed with regard to differentiation and representation,[22] non-correlational ontologies such as Object Oriented Ontology are seen as platforms that offer a potential means of liberating differentiation from human perception. This is important because, without it, the digital will always be digital for us and not for itself, and therefore differentiation – as described in Appendix 9 – is always conditional.[23] The issue of causation thus brings the correlational condition into focus, so that a digital practice without the contingency of *sufficient reason* can be articulated.

I should emphasise again that the aspects of causation which are of interest are *not* causal relata – the things that are in relation – but the relations themselves: the manner, and in particular, the motivations by which relata come into relations. The difficulty of course is that the ontological construct of *Beyng* has compounded these so that the 'what' of relata is conflated with the 'how' of relations. As this could mean that our question gets stuck in a circular non sequitur about the relation of relations to relations,[24] for the sake of clarity it is better to remove relata from consideration as much as possible and focus just on causal relations.

Before addressing Harman's attempt "to revitalise the theme of causation that has largely vanished from philosophy", it is perhaps necessary to briefly outline what it is that is supposed to have disappeared ("Time, Space, Essence" 1). Of course this is an impossible

task within the confines of this thesis, but within limited scope it is useful to provide some context as it clarifies the key problem: that some motivation is needed for mereological participation beyond various forms of deference to some unknowable mediating agent.

In this regard, Michael Austin's "friendly Disagreement with Graham Harman" provides a counterfoil to Harman's position, placing his theory of causation in a broader context ("Exist Is to Change").[25] Treading nimbly around, but not passing over Aristotle's four causes,[26] Austin identifies six ways of viewing causation: occasionalism, empiricism, correlationism, naturalism, relationism and vitalism. Austin's argument is that none of the first five approaches adequately address the Aristotelean 'final cause': "that for the sake for which a thing is" (Aristotle, *Metaphysics* 36).[27] This is because in one way or another each causal proposition rests on a transcendent metaphysical argument.[28] For occasionalism and empiricism, causality – in the form of either a "meddling god who intervenes in every least event in the universe"; or the dispassionate logic of pure reason (it does not really make much difference which) – is simply taken as a given (Harman, "Time, Space, Essence" 2; *On Vicarious Causation* 194): something happens because something else says it does! Correlationalism,[29] says Austin, falls into the same trap by making causality a function of experience, without doing anything to address why that experience occurs in the first place: something happens because I think it does! Although a rather vague term, naturalism – being only concerned with the matter of 'stuff' and not the question of why – is dismissed rather mockingly by both Austin and Harman as "metaphysics fit for a two-year-old" (Harman, *Prince of Networks* 109).[30] Perhaps ontologically closer to questions of concern here, relationism – under which Austin locates both Latour and Whitehead – tends to reduce ontology to relations and in the end provides "no causal mechanism that allows it to detach from one set of relations and re-ally with new forces" ("Exist Is to Change" 78). Of course, the rejoinder here might be 'what allied them in the first

place?', but this then enters into the circular argument that has already been dismissed: the argument that relations themselves don't provide 'final cause' for relations being.

It is into this causal vacuum that Harman introduces his 'new' theory of causation – although it's not *new* at all, but certainly a calling to account of previous positions as outlined above. As might be anticipated, the point of entry for Harman is Heidegger's tool-being and the *ready-to-hand* and *present-to-hand* of objects.[31] Discussion of these concepts has been limited until now in order to avoid getting sidetracked. However, it is now necessary to expand on them because they are central to Harman's argument for causation.[32]

Tool-being is a phrase that Harman uses to refer to Heidegger's conception of the way humans interact with the world.[33] For Harman this is the key to Heidegger's philosophy, but also, I suggest, to his own theory of vicarious causation (Harman, *Tool-being* 4). Tool-being speaks directly to the relational difference between being with an object (present-at-hand), and being alongside an object (ready-to-hand). In this sense, being with an object is a theoretical attitude which projects the factuality of the object.[34] What Heidegger wants to return to with *Beyng* is a state of being alongside – being absorbed in the world rather than seeing it at a distance as a thing that simply occurs (*Being and Time* 80-81). In Heidegger's oft-cited example, the hammer is used to explain this:

> The less we just stare at the hammer-Thing, and the more we seize hold of it and use it, the more primordial does our relationship to it become, and the more unveiledly is it encountered as that which it is – as equipment. The hammering itself uncovers the specific 'manipulability' ["Handlichkeit"] of the hammer. The kind of Being which equipment possesses – in which it manifests itself in its own right – we call "readiness-to-hand" [Zuhandenheit]… If we look at

> Things just 'theoretically', we can get along without understanding readiness-to-hand. But when we deal with them by using them and manipulating them, this activity is not a blind one; it has its own kind of sight, by which our manipulation is guided and from which it acquires its specific Thingly character. (Heidegger, *Being and Time* 98)

> The ready-to-hand is not grasped theoretically at all, nor is it itself the sort of thing that circumspection takes proximally as a circumspective theme. The peculiarity of what is proximally ready-to-hand is that, in its readiness-to-hand, it must, as it were, withdraw [zurückzuziehen] in order to be ready-to-hand quite authentically. (Heidegger, *Being and Time* 99)

In these quotes it is almost as if we are really talking about two quite different things inhabiting the same object – one a 'real' object as equipment, defined and tangible yet ultimately withdrawn; the other a more readily available 'sensual' object that is revealed though use.[35] Recalling earlier discussions of knowledge production, it is of course though this being alongside of, being ready-to-hand, that the 'truth' – *aletheia*, is revealed.[36] However, this still does not provide us with any 'final cause': what motivates things to 'pull up' alongside other things: to move from concealment to un-concelament?

At this point, despite the fact that Harman derives his theory of causation from Heidegger, a significant difference is apparent in the way each approaches the problem. Hedeigger's conception of causation comes out of the primal fourfold of "earth and sky, divinities and mortals" (*Poetry, Language, Thought* 149).[37] Of course, Heidegger's account – as he attempts to locate causation within the fourfold by asking questions such as: "what unites them from the beginning" and "what does 'cause' really mean" – is far more convoluted than there is time to explain here (Heidegger, *Question Concerning Technology* 6-

12). But it suffices to say he eventually concludes by saying that 'final cause'[38] is bringing-forth: the revealing of that which is concealed (Heidegger, *Question Concerning Technology* 11-12).[39] As discussed earlier, this reading is derived from the Greek aletheia – "that which is 'not hidden or forgotten'" which he translates as 'truth' (Inwood 13).[40]

Despite these differences, what is clear is that final cause – as bringing-forth – happens in the gathering of elements in a fourfold.[41] While there is a dialectic tendency to interpret this as meaning there must be a symmetrical place of withdrawal in order that things can be revealed from somewhere, this would require a fifth unknown entity – a problem, seeing as we only have a fourfold ontology! It is this deferral that results in Harman labelling Heidegger an 'occasionalist': "On the one hand, objects withdraw into inscrutable depth. On the other, we know that they somehow relate, or nothing would happen…" (Harman, "Time, Space, Essence" 5). Therefore, Harman agues, there must be some other unknown entity responsible for making things happen.

I find Harman's argument here particularly limited in that it only seems capable of thinking in dialectical terms of interior and exterior, concealed and unconcealed, ready-to-hand, present-at-hand. I want to suggest that we should understand Heideggarian causation as existing in neither the interior-withdrawn or the exterior-present, but in a *non-identity* that is both and neither at the same time. We will return to this point shortly, but first I want to give further consideration to Harman's theory of causation.

Harman's solution to what he sees as the universal problem of causation – the contest between any two entities in the world – is to retreat even further into the interior of objects; to the total withdrawal of the object within itself, a withdrawal that extends beyond the reach of both present-at-hand and ready-at-hand, on into infinity.[42] What happens as a result of this is that causation becomes oriented to the

'new' primal fourfold – a quadruple object that is constructed by pairings of features: Real/Sensual and Qualities/Object.[43] In this, the 'real object' is never fully available. What one object encounters of another object is only ever its 'sensual qualities'. Objects themselves – the 'real objects' – says Harman, cannot be touched and our "access to the things themselves can only be indirect" (*Quadruple* 73).

Although necessarily brief, this account of the quadruple object is sufficient for us to identify relevant questions with regard to individuation and causation. Harman speaks to these when he observes that "total autonomy is incompatible with relations of any sort…" (*Quadruple* 69). Indeed, this is a fair summation of the problems that confront the digital, too – how to be differentiated without being represented? Or, as Harman explains in relation to Heidegger: "On the one hand, objects withdrawal to inscrutable depths. On the other, we know that they somehow relate, or nothing would happen and presence-at-hand would not exist" ("Time, Space, Essence" 5). But, if anything, quadruple objects are even more resolutely discrete than Heidegger's present-at-hand tools, as they are "always receding from one another" – each successive withdrawal instigating another and so on (Harman, *Quadruple* 75). Like a matryoshka doll, the substance of 'real objects' is merely a shell concealing itself ad infinitum. Providing no stable figure on which to build cause, the quadruple object functions as a doll of all dolls or a class of all classes. Rather than resolving causation, it defers to an ever-absent entity that can never ultimately be held accountable as an individual in nominological terms.

To be fair, however, even though Harman does dissect the object in this way, he does hold cause to account. As the 'real object' withdraws ever further inside itself, Harman evokes *indirect* causation as a solution to the causal problem.[44] Here indirect causation or, as Harman rebrands it, 'vicarious causation', simply means that some intermediary is involved in the causal interaction of entities. Contesting the

accountability of this, Austin sees the ultimate inaccessibility of the real object as a fundamental limit to Harman's ontology, arguing that it doesn't really address "final cause" – the question of why change occurs at all ("Exist Is to Change" 66). However, while I agree that Harman's ontology is causally inadequate in terms of addressing the question of differentiated individuals, it is not because he doesn't provide a "final cause". Harman is very clear about this, saying that vicarious causation results from the internal fusions between various parts of the quadruple object (*Quadruple Object* 99-102).[45] To save unpacking this even further, we can use Peter Wolfendale's relentless forensic analysis of the quadruple object to make the point. Wolfendale's challenge to Harman's vicarious causation is with regard to the efficacy of 'allure', the term Harman uses for the special "fusion of withdrawn real objects with accessible surface qualities" (*Quadruple Object* 104). In what way, asks Wolfendale, "can allure be said to succeed where representation fails?" (Wolfendale, 101). Indeed, while allure performs a vicarious function between 'real' objects and 'sensual' objects, there seems little to distinguish it from the problems of representation discussed in section 8.5 with regard to phenomenology. Harman only adds further weight to this criticism by identifying an unspecified "intentional agent as the vicarious cause of otherwise separate phenomena" ("*On Vicarious Causation*" 219).[46]

Thus it is not that Harman doesn't provide an explanation for why things happen, as Austin suggests, but that his solution is plagued by the same problems that he observes in Heidegger: making cause contingent on resolutely withdrawn objects is in the end no different from making it dependent on 'tools' that are neither present nor ready at hand. In both cases, reality disintegrates under the "impossibility of causal connections between two substances" (Heidegger, "Time, Space, Essence" 2). Cause thus becomes as unknowable to us as it is irrevocably unavailable: an occasionalist class of all classes and a *reason without cause*.

10.2.1 **Irresistible gains**

If Object Oriented Ontology can be seen as an ontology without a *real* object, as suggested by its withdrawal into the quadruple object, this is perhaps because *that* object is speculative in the sense that it raises questions about what epistemic access is granted to it. Indeed, in as much as Object Oriented Ontology is a subspecies of 'Speculative Realism',[47] as Harman concedes, such absolute knowledge of objects is necessarily rejected (Harman, *Bells and Whistles* 6). While there is no need to untangle the intricacies of these particular factions of post-Kantian thought here, it is necessary to address the epistemic assumptions that seem to have been shadowing the question of digital differentiation, no matter which way we have approached it throughout this text. Most of the questions raised regarding what it means for a thing to be digital – what it means to be individuated instead of represented – seem to come epistemically undone by the question of what provides sufficient reason. Unfortunately, the answers provided to this question invariably lead to charges of occasionalism, as we have seen with Harman and Heidegger. Occasionalist arguments cannot lay claim to the digital because they defer the in-itself to another un-named entity. This is the inherent weakness of formal indication. What we need to find out, then, is if there is a *practical* alternative. I stress practical here to remind us that, as we navigate through Speculative, Realist and Materialist, flat and flush object oriented philosophies, our purpose is to look for more than just a philosophical solution to the correlational limitations of formal indication. That said, we will again leave practice to one side for a while as we consider philosophical responses to this problem.

This task is made all the more difficult by the lack of uniform terminology surrounding what can at best be described as a loosely grouped matrix of thinkers, unified primarily by their opposition to correlationism. Nuances of interpretation amid this group have lead to multiple threads of

sometimes complementary and at other times conflicting positions that make referring to them collectively problematic. For this reason, the focus of the analysis here tends to be on individuals rather than schools of thought. That said, using collective terms such as Speculative Realism is un-avoidable and thus it is necessary to define the use of these to the extent possible. Unless otherwise stated, Speculative Realism is taken as broadly inclusive of positions deriving from the Speculative Realism Workshop[48] in 2007, and includes Object Oriented Ontology and Speculative Materialism.[49] Similarly, 'New Materialism' is used broadly in reference to various forms of relational ontologies, largely limited here to Vital Materialism or Agential Realism.[50] In cases where it is necessary to refer to Speculative Realism and New Materialism collectively, I take the lead from Levi Bryant, Nick Snick and Graham Harman's articulation of the "speculative turn", and propose the term *speculative ontology* (Bryant et al, *The Speculative Turn* 1-18).[51] Although this risks being confused with other speculative philosophical propositions,[52] its emphasis on the speculative anticipates the practical resolution I am working towards in this thesis.

As well as this point of clarification, the position of this thesis regarding what I am collectively calling speculative ontologies needs to be stated. As Robin Mackay, Luke Pendrell and James Trafford point out in the introduction to *Speculative Aesthetics*, the immediate promise of flattening ontology proposed by speculative ontology appears to have irresistible appeal to the art world (Beech et al 1). With an economy that goes beyond the democratic agendas of "the avant-garde's provocations or the social experiments of relational aesthetics", Tom Trevatt argues that Speculative Realism speaks to a more 'cosmic' universe in which "art does not rely on human subjectivity as the final guarantor" (Trevatt in Beech 27). Evoking artists Robert Smithson's contention that art should *not* be 'interesting' – interesting to humans, that is – Trevatt suggests that such 'cosmic' levelling is directly opposed to the Duchampian conception of the human as an 'art coefficient'

which performs art in such a way that we "are the meaning of the work" (Trevatt in Beech 28). Although it seems unnecessary to pit humans against the world in quite this way, Trevatt's point is pertinent in that it problematises the status of art beyond the limits of human reasoning, suggesting instead that the cosmos might be as interested in art as we are!

As irresistible as such cosmic levelling seems to be, its uptake by artists and critics has, as Andrew Cole asserts, been "beset by contradictions, misguided assumptions, and outright fallacies" (Cole 319). Indeed, the superficial interpretations that Cole rightly seeks to address seem naively blind to the human coefficient of art practice. The sort of token agentic empowerment of non-human 'things' that we encounter in many contemporary artworks that engage with these ideas, is typical of what Quentin Meillassoux would likely consider 'naive' readings of speculative matter/realist thinking (Meillassoux 2008).[53] Taking artist Elvin Flamingo's *The Symbosity of Creation* as an example[54], the need for more considered artistic responses to the problem of correlationism is apparent. Currently in its fifth year, this twenty-year long bio-art project consists of a series of specimen cabinets, within which a glass labyrinth of scientific flasks and tubes provides an architecture within which a colony of ants constructs its environment. To suggest that we should be blind to the demiurge of the artwork and accept the proposition that the work "lives its own life" in symbiotic harmony with the human amid the contrivance of scientific apparatus, is to miss the primary correlational dilemma entirely (Czarnecki). Such ineffectual gestures appear to be blind to their own indexical orientation toward the human. As Cole infers, it seems self-evident that you can't have an art practice if humans are not at the centre of it.[55] Unless it is possible to usurp the assumption of the human in art practice and still produce something we can call art, then works such as *The Symbosity of Creation* will remain constrained by the correlational imperative. Anything else, no matter how well intended, is

simply an empty aestheticisation of a much more complex and significant problem.

These brief comments regarding the infusion of speculative ontology into art discourse and practice are made in order to establish distance from some of these more limited interpretations, and to assert why, in pursuit of the digital in-itself, neither a superficial response or a coefficient retort will do. From this, I wish to signal the need to develop a more sophisticated understanding of non-correlationism and its implications for art practice; but also signal the need for practice itself to be rigorously open to *radical* speculative solutions that are prepared to address *both* coefficient and cosmic positions. This is challenging, not just because of the depth of philosophical knowledge required to understand the complexity of correlational critiques, but because from such an informed position, art practice itself seems confounded by the sufficiency of its own reason: when ontology is truly flattened, then causation – with which it is inextricably connected – is absolutely disinterested in art in-itself.

10.2.2 **Flat Ontology**

When I talk of a *flat-ontology* here I should be more specific. I am not speaking of it in Floridi's *ontocentric* sense as a levelling because, as suggested by Bryant, flattening does not impose equivalency ("Flat Ontology"). Whereas ontocentrism reduces individuals to the same ontological type, I seek an ontology that treats all things as individuals in their own right – not as elemental units (DeLanda, *Intensive Science* 47).[56] In contrast, we can thus see how *ontocentrism* fails to create individuals and insists on classes. Thus we should also understand that Floridi's *Philosophy of Information* is a reductionist theory in which levels of abstraction reduce everything to the same atomic element – semantic content.[57] As Bryant explains with regard to Speculative Realism, while

flat-ontologies don't deny that things are made up out of other things like atoms, these "atoms are not more real that the rock and the rock is not less real than the atoms or atomic particles" from which it is composed ("Flat Ontology"). Or, put in more abstract terms by Ian Bogost, "all things equally exist, *yet they do not exist equally*" ("Materialisms"). This, then makes clear why it is important to introduce Speculative Realism here: it offers the potential of locating that which is differentiated *in-itself*. From the fundamental assertion that everything is equal yet not the same, it is clear that the intention is to treat entities only as individuals. Yet this does not make Speculative Realism the post-Kantian equivalent of Goodman's nominology, because in also allowing for things to be made up of other things, and for those things to be individuals too, it is clearly using a class argument which, on the basis of the Russell Paradox, leads to an ontology of infinite regression which has no finite cause.

Flat-ontology, conceived of in this way, thus seems to leave us with the same difficulties encountered with *Set Theory* in section 8.3.1. However, this does not mean we should abandon the Speculative Realist cause without looking beyond this question of equivalency, to ask where causation is located within such flat, non-correlational ontologies. While we have seen that Harman's *vicarious causation* is weakened by its occasionalist tendencies, it was suggested that Heidegger's *fourfold* might somehow manage to evade the duality of internalisation or externalisation of causation by being present in both and neither at the same time. To position this more clearly, then, it is helpful to examine Meillassoux's perhaps more radical approach to the non-correlational positioning of causation or sufficient reason.[58]

Meillassoux, of course, coined the term *correlational* as a way of encapsulating all thinking by which "we only ever have access to the correlation between thinking and being… [and] cannot think the realms of subjectivity and objectivity independently of one another." (*After Finitude* 21). The various mutations of what we now know as Speculative

Realism,[59] have rallied around this call for a rejection of the Kantian *in-itself,* so much so as to make it their own. I do not want to go over what has been covered in depth elsewhere in terms of Meillassoux's core thesis.[60] I do, however, want to look specifically at the question of *facticity* and how this relates to the question of sufficient reason, so that we can re-consider *becoming* as the method of evading occasionalism and allowing things to be *brought-forth* for themselves.[61] Of course, doing this without falling in line with the *correlational* 'two-step' is difficult, so I will be succinct in outlining Meillassoux's core argument 'against' correlationism.[62]

The so called "*correlationist* two-step", together with the "correlationist circle", form the basis of Meillassoux's 'assault' on modern philosophy[63] (*After Finitude* 22). These two terms present different ways of approaching the *thing-in-itself*. The more familiar *circle* is the problem we have been encountering with regard to representation and our inability to think of the *in-itself* without being implicated in it.[64] Meillassoux calls this 'weak' correlationism (*After Finitude* 52-59). The *two-step,* which focuses on the primacy of relations rather than subjects, is also familiar to us in the various quasi and meta entities discussed earlier in sections 8.6.1 and 9.1.4. Meillassoux calls this 'strong' correlationism and cites Heidegger as a prime example (*After Finitude* 5–8).[65]

Both the strong and the weak forms highlight the difficulties encountered here with regard to identifying a differentiated non-representational entity – an *in-itself*. The unifying unresolved problem is that *thought internalises everything* – a problem we see played out in Harman's withdrawn object. His solution – obviously not unrelated to Meillassoux's, given their common commitment to Speculative Realism – is to deny access to the *in-itself* altogether by sublimating it within a 'sensual' in-itself. This, I have suggested, is a surrogacy that no matter how seductively presented is representation by another name. It does not, however, go quite so far as to make the *in-itself* 'real' object obsolete

and leave only relations – as perhaps Serres and Leibniz might be seen to do, or as Haraway and Jane Bennett similarly suggest. It is here, too, that Harman seems to have pigeonholed Heidegger because of his commitment to the relational event of *bringing-forth* – although whether this is quite as irretrievable as Harman suggests remains to be seen.

In pursuit of the digital we have then arrived at a place very similar to that which Meillassoux confronts – the correlational *in-itself*; a position resigned to the factical limits of human thought, as defined by the necessity of sufficient reason. The digital, it seems, is unthinkable and unrealisable unless we can think an absolutely differentiated *in-itself* that is outside of the thought/being construct! But what would it mean to do that? To think an un-thought? Or maybe to think a thought beyond reason?

Ironically, Meillassoux's 'radical' proposition is not that we throw out correlational thinking, but that we accept the limitations of thinking/being as the *in-itself*. In other words, instead of trying to wriggle free from the correlational binding, we should take absolute facticity to be such that it could be different from how it is for us. If the inaccessibility of the absolutely differentiated *in-itself* is the impossibility of thinking something outside of our own thoughts, then the logical consequence of this argument is that *facticity* – the contingency of being human – must be understood as "the non-facticity of facticity" or "the non-factual essence of fact" (Meillassoux, *After Finitude* 129). Thus the contingency of sufficient reason – that is, reason for us as humans – is without reason, or as Meillassoux explains, "it is unthinkable that the unthinkable is impossible" (*After Finitude* 68-69).

Clearly the term *facticity* here has a radically different meaning than elsewhere in the text.[66] Whereas to Heidegger *facticity* is taken as a given of being in the world, Meillassoux makes no such assumption: it is *not-being* that is taken as fact, as the only contingency there is. Facticity

now assumes an inverse reading for the remainder of the thesis – one in which the non-factual is factual, the un-thinkable is thinkable and un-reason is reasonable.

But rather than being an Undecidability Problem in which no finite outcome can be determined,[67] this "principle of unreason", as Meillassoux calls it, undoes sufficient reason by turning the *in-itself* into facticity of unreason. Film and Media theorist Thomas Sutherland summarises this compounding argument succinctly, saying: "Facticity is the principle of 'un-reason': absolute contingency – and thus the absolute absence of sufficient reason" (T. Sutherland, "Law of Becoming" 162). While this explanation leaves many aspects of Meillassoux's compelling argument – such as 'ache-fossils' and 'hyper-chaos' – open to subsequent discussion, it is adequate for the argument here to address the point of interest regarding sufficient reason. In particular, the interest is how we can re-read *bringing-forth* in the unthinkable absolute of being *in-itself,* such that it avoids occasionalist critique.

10.2.3 **Unthinking being**

Of course, as Harman shows in his treatment of Meillassoux, it is easy to find reasons to brand ontological arguments as occasionalist.[68] We should, then, look at Meillassoux's labelling of Heidegger as a relational correlationist a little more fully. This is not to defend Heidegger against such claims, but rather to consider if *bringing-forth* might exist without the contingency of sufficient reason; or, put more positively, to consider if un-reason might *bring-forth* the digital in-itself. Setting aside the distinctions of 'strong' and 'weak' forms of correlationism for reasons of clarity, Meillassoux's primary charge against Heidegger is that despite his emphasis on the ontological primacy of the *event* over the subject and object, "Heidegger, remains faithful to the correlationist exigency

inherited from Kant and continued in Husserlian phenomenology" (*After Finitude* 18). In other words, the *event* is always a *human* event in which phenomena are represented as present-at or ready-to *our* hand. It is this co-propriation of subject and object – the inseparable connectedness of man and beings – that marks Heidegger as part of the post-Kantian continuum from Meillassoux's perspective.[69] While Heidegger can be seen to conform to this correlational critique, it should be pointed out that this does not reflect the ontological doubling of the "authenticity and inauthenticity" of beings developed in *Being and Time* (68). As acknowledged earlier, and argued by others,[70] the *ontological difference* can be seen as residing in the tension between realism and idealism. While this doesn't dismiss Meillassoux's charge, it does make it provisional on a fuller understanding of un-reason with regard to becoming.

In order to focus the discussion on non-correlational bringing-forth, I want to look specifically at Meillassoux's treatment of *becoming* and *bringing forth* in a journal article which appeared after the first publication of *Après la finitude* in 2006, and before the English translation in 2008 ("Potentiality and Virtuality"). It is not that I place a special significance on this interval of time, but that the article, perhaps having crystallised some earlier thoughts, addresses the question of *becoming* in greater depth. In particular, section 5, "Ontological Consequences of the Non-All", is of interest here because it sets out to "determine the sense of a becoming within which laws themselves would be contingent" (Meillassoux, "Potentiality and Virtuality" 69). Immediately evident here is a clarity about becoming that seems to get lost in the complexity of the articulation in *After Infinitude*.[71] What Meillassoux is arguing for is *not* the abandonment of becoming per se, but for a becoming *without* contingency or reason: a bringing-forth of *in-itself* from *un-reason*, in which becoming is in- and of-itself, and not for us.

Such a becoming is in marked contrast to a becoming that is a pre-determined bringing forth of an a priori something – a something that is otherwise unavailable to us. This, then, is the basis of Meillassoux's correlational charge against Heidegger: that what is *brought forth by beyng,* is *brought forth* from somewhere else and is therefore not in-itself; and there remains some correlation between subject and object from which relationality stems. Subjects as such are contingent on the assumption of there being sufficient reason for them to already be. This, then, imposes a severe limitation on our conception of formal indication: while formal indication may be uncommitted to its subject, it still assumes the existence of a subject prior to it being indicated. Because to indicate assumes the prior existence of some other thing to point at, even if we don't quite know what that other thing is.[72]

Thus emphasising the primacy of relations does not, in Meillassoux's understanding, exempt being from the correlational circle. What Meillassoux is after is a more radical becoming – one without the necessity of anything becoming at all: becoming without the contingency of sufficient reason. The solution which he proposes – one to which Heidegger might not have been unsympathetic – is time:

> I posit that time can bring forth any non-contradictory set of possibilities. As a result, I accord to time the capacity to bring forth new laws which were not 'potentially' contained in some fixed set of possibles; I accord to time the capacity to bring forth situations which were not at all contained in precedent situations: of creating new cases, rather than merely actualizing potentialities that eternally pre-exist their fulguration. If we maintain that becoming is not only capable of bringing forth cases on the basis of a pre-given universe of cases, we must then understand that it follows that such cases irrupt, properly speaking, from nothing, since no structure contains them as eternal potentialities before their emergence: we thus make irruption ex nihilo the very

> concept of a temporality delivered to its pure immanence (Meillassoux, "Potentiality and Virtuality" 72).

Although it is time that is given the credit here, the radicalness of this proposition rests in the argument that what is brought forth comes out of *nothing,*[73] as this alone is without the contingency of that which already exists. It is un-reason or "contingency *alone* that is necessary" (Meillassoux, *After Finitude* 130). So it is not that *bringing-forth* or *becoming* are problematic in themselves, but that they too must also be susceptible to contingency – to *unreason*.[74] Since there can be no assumption that things will become, as they are not a priori given, time becomes the arbiter.

The treatment of time needs some brief explication here also.[75] Time is not seen as a linear arrangement of possibilities in which there are a finite number of potential outcomes, rather, it is that which creates *un-reasoned* possibilities that otherwise would not exist. To explain this, Meillassoux compares correlational time in which the roll of a die offers us one of its faces on the supposition of six possible outcomes, to the roll of a die in which time inserts into each throw the possibility to "bring forth a seventh case" (*After Finitude* 233).

This, of course, speaks back to the question of being *in* time.[76] Here perhaps we see parallels between correlational time and the linear time of Zeno's arrow, which pre-constitutes the target in its flight path without the target itself ever becoming for the arrow. Rather than the example of the die, Meillassoux's description of the theoretically infinite number of points in a rope of finite length provides a more apt comparison (*After Finitude* 164). Through this comparison we can also see how Goodman's conception of the erleb relates to Meillassoux's time from n*othing*. Whereas Leibniz's monad locates time externally and requires the external impetus of 'sufficient reason', the erleb itself is a subjectless spatio-temporal time-slice that is self-defining. If the 'time complexity' of

the algorithm through which the erleb is *in* time, means that it is self-defining, then we can see it as un-reasonably containing its own contingency. Developing this further we can also argue that the erleb is subjectless since it is nothing but contingent time. Given that it is its own contingency, we can also say that it has 'unreason', in that its reason is not *our* reason and therefore might be considered un-reasonable. Transposing this into Meillassoux's example of the die, if we were to roll an erleb, the number of faces that might be presented is not within our reason.[77]

This is not to say that Meillassoux reads Goodman in this way. In fact, with regard to the problem of induction – the problem of inducing the future from the past[78] – Meillassoux is critical of Goodman's predicate logic on the grounds that it has recourse to sufficient reason ("Potentiality and Virtuality" 224). But this does not mean that he rejects Goodman's thesis outright either. Rather, Meillassoux argues that "it is possible at once to accept the Hume-Goodman verdict of failure, and yet to dispute that it follows that every ontological approach to the problem is thereby disqualified" ("Potentiality and Virtuality" 225). The phrase 'verdict of failure' here is a reference to Goodman's position with regards to the Russell Paradox – the set of all sets not containing itself.[79] With regard to set theory, it is important to acknowledge that while Meillassoux is enthusiastic about Cantor's set theory because it extends reason beyond the absolute, he is no more a proponent of infinity than finity.[80] Meillassoux's core text – *After Finitude – is,* it turns out, not about the infinite, or indeed the finite, but the *transfinite:* the detotalisation of numbers (*After Finitude* 16). The *transfinite* is a speculative construct proposed by Cantor, which is infinite but not absolutely infinite, i.e. finite at some point.[81] It is not necessary to expand on Cantor's theory of transfinite numbers more than this here,[82] but the point can be made that the construct of the *transfinite* is an unreasoning of the contingency of the absolute. But like *un-reason* which does not preclude reason, the

transfinite does not preclude the finite. This is the contingency with which Meillassoux both accepts and rejects Goodman's argument.

Unfortunately, Meillassoux's analysis of Goodman is limited in scope in my view: it tends to focus more on Hulme, and does not address Goodman's broader mereological proposition. We might reasonably assume that Goodman would likely have been even less generous towards Meillassoux and rejected his argument on the basis that, as a set construct, the *transfinite* cannot be admitted as an individuated mereological entity. However, it would not follow that the two positions are incompatible from Meillassoux's perspective. The radicality of Meillassoux's thesis with regard to the problem of sufficient reason is very clear: removing the contingency of reason neither disqualifies nor validates reason, because reason is still a potential outcome of the contingency of unreason. This is the speculative strength of Meillissoux's argument that means "you must begin with correlationism, then show that correlationism must itself posit the facticity of the correlation…" ("Potentiality and Virtuality" 433).[83]

This point, which seems core to understanding non-correlationism, or at least understanding causality with regard to sufficient reason, seems to be frequently overlooked in the art world's eagerness to embrace the Speculative Realist cause as the ultimate solution to the avant-garde's dream of "levelling to the artwork with the non-art universe" (Beech et al, 1). If the non-correlational argument is to have any traction in resolving the question of method and sufficient reason within art practice, it seems essential to maintain the clarity of this argument as we move forward.

10.2.4 **No Matter What**

In order to address the question of what, if any, methods are operative within this new understanding of a 'un-reasoned' becoming, I want to

go back and address the condition of nothingness (*ex nihilo*), which Meillassoux introduced in the preceding quote.[84] In it there is an apparent risk of assuming that nothing itself is a given, and this would mean that nothing is something. Thus, by simply having substituted something for nothing and reason for unreason, the argument would again resort to the contingency of sufficient reason and there would be no need to revise methods.

This is the issue that Sutherland addresses when he asks if "Meillassoux is actually able to break free of the shackles of sufficient reason…" (T. Sutherland, "Law of Becoming" 170). Although Sutherland approaches this question from the point of view of it being an inherent contradiction,[85] rather than a dualist incompatibility as Graham Harman does[86], it is in fact hard to separate these two positions: a contradiction by definition would seem to need a contrary or opposing position. However, the common motivation both hold onto is the need to ground causality; but the problem remains that unreason potentially lends itself to this as easily as reason, and we are again left trying to figure out our dance moves for the correlational two-step.

Here, Tristan Garcia's treatment of *nothing* and *something* with regard to in-itself, is instructive. Although Garcia's *Treatise on Things* does not carry the same seminal significance within Speculative Realist circles as Meillassoux's *After Finitude,* it is equally as radical in its treatment of the *in-itself*. Again, as with Meillassoux, it is necessary to define the terms of the discussion, while acknowledging the inevitable restrictions this text places on doing so.[87] The aim, then, is not to consider Garcia's entire *treatise,* but to consider how he addresses the dualist incompatibilities highlighted above by Harman (Garcia, *Form and Object*).[88]

Blurring binary assumptions, Garcia stresses that a thing is defined both by what it is and what it is not: "A thing is nothing other than the difference between that which is in this thing and that in which this

thing is" (*Form and Object* 13). This seems a fairly unproblematic observation of the fact that differentiated things can be distinguished from what they are not.[89] We will return to this point again in a moment. On the basis of this condition, Garcia goes on to assert that "being nothing is still being something (since nothing is something)" (*Form and Object* 105).[90] Although this Klein bottle[91] articulation risks turning itself inside-out, it responds directly to the contradictions that trouble Sutherland and Harman. It manages to do this by *compacting* the object so that it is at once itself, but also not itself. Thus, oppositional frameworks are both broken down and maintained at the same time.

Before expanding further on Garcia's idea of 'compactness', I want to stress some connections to the digital, even though they may already be blatantly obvious. The point of entry here is Garcia's treatment of the Boolean pairing of *something* and *nothing*. As a computational operator, Boolean logic attributes true or false values such that: true = 1 and false = 0. Taking 0 to mean zero,[92] what is false thus becomes nothing. And conversely 1, as the only Boolean alternative to nothing, becomes something. We thus get a Boolean correlation between truth (1) and something, and false (0) and nothing. What is obvious here is that we can see the basis of the correlation assumption that what is known to us as something is true, and what is not known to us is nothing and false. Given that only what is known to us is true (something), then for the *in-itself* to be true, it is true for us and not for what we don't know (false).[93] Thus we can see how Boolean logic promotes a correlational conception of the *in-itself* as that which is not for us.

While this is not especially insightful, if we return to Garcia's *something* and *nothing,* visualised as a Klein bottle that has only one surface, we can extrapolate that a non-correlational Boolean logic would mean that 1 and 0, and true and false, are part of the same continuous entity. In this conception, the binary opposition of 1 and 0 is confounded as they exist not in contrast to each other but as *continuous* parts of each

other. We might then also apply Garcia's 'compact in-itself' construct to the relationship between the digital and the analog and conclude that the *differentiated digital exists as an in-itself through its continuous relationship to analog*.[94]

This collapsing of difference is a consistent strategy of Garcia's ontology, one that he defines as 'compactness': "the condition of possibility of a thing is its impossibility" ("Crossing Ways" 20). Sounding very much like Meillassoux's argument for the *contingency* of *un-reason*, the consequence of 'compactness', from Garcia's perspective, is that the existence of *in-itself* no longer has ontological primacy. As Garcia sees it, there is no such thing as the definitive *in-itself* because it is always caught up in the not-itself: "[T]he in-itself is not merely inaccessible. It is 'compact'… And if there were a thing-in-itself, it could only be in-itself in the world, that is, in something other than itself. Therefore, no in-itself exists *in itself*" (Garcia, "Crossing Ways" 19).[95] In other words, Garcia's *in-itself* is the relational condition of being itself in another thing.[96]

'Compactness', then, is "an equality operator, allowing us to reach a point where no-matter-what is something as much as another thing" (Garcia, "Crossing Ways" 21). Embodying the quality of 'compactness', *no-matter-what* renders something and nothing *flush* so that simultaneously a thing "is never no-matter-what", and "Nonetheless: no-matter-what is not nothing" (*Garcia,* "Crossing Ways" 21 & 23). 'Compactness', then, arises out of *no-matter-what's* need to make things as ontologically 'weak' or un-contingent as possible in order that they have no-care, no-matter-what. Through this, Garcia suggests that it is possible to attribute *in-itself* differentiation to anything without discrimination ("What Is Something?" 47). If we ask, what would be weak enough to define *in-itself* without destroying the *in-something-else* in the process, Garcia's typically formal response is that: "The weakest something that we can conceive of is alone, deprived of itself, exiled

outside itself and inside something other than itself, inside the world: it is so weak that anything can be it" ("What Is Something?" 51).

Thus the strategies of 'compactness' and *unreason* seem very comparable.[97] Both, it seems, strive to create a more radically flattened or *flush* ontology by being both what they are and what they are not. They seem to function as negentropic states that afford the *in-itself* the greatest possible potential by being as weak as possible.[98] In this way, *un-reason* and 'compactness' become impervious to correlational critique as they nullify the correlate between subject and object.

Although this might seem similar to Serres' quasi-object, 'compactness' is a far more radical proposition.[99] Whereas a quasi-object is a relational object that arbitrates between itself and a designated subject, the 'compact' object is an object by virtue of its being in something else. The 'compact' object is not some go-between messenger; it is defined by the compression of difference between what a thing is and what it is not. It is not a half subject, half object proposition, but the impossible condition of being what it is by not being what it is. Of course, the difficulty this presents us with is that it now becomes very difficult to differentiate between things at all.

Fortunately, this is not quite as diabolical as it seems and Garcia provides some recourse to *in-itself* though the "no-matter-what" (Garcia, *Form and Object* 19-30). *No-matter-what* adds to 'compactness' an indifference that flattens ontology even further. If non-correlationism's factically flattens ontology, then *no-matter-what* adds a qualitative dimension and smooths it out even more. It "indicates nothing other than the possibility of a flatness: that by which everything is *equally*" (Garcia, *Form and Object* 30). Meillassoux hints at a similar flattening in the *may-be* of un-reason *(Time Without Becoming* 27).[100] Although not developed in detail by Meillassoux, the speculative *may-be,* like the *no-matter-what,* seems to have the *un-reasonable*

effect of making the potential of what *may-be*, *flush* with the what-is. *Flush* here indicates more than simply an equitable ontological flattening, as discussed earlier with regard to Bogost and Bryant,[101] but an additional smoothing effect that is inherent in the double sense of something being *flush:* of being both level with, and affluent: level in the sense that all objects are equal, and affluent in the sense that they afford qualitative differentiation. What I am calling a *flush ontology* acknowledges the qualitative dimension of *no-matter-what* and distinguishes it from other less radical, flat non-correlational ontologies. Whereas un-reason insists on everything including reason being unreasonable, *no-matter-what's* radical refusal to attribute importance to anything renders things absolutely flat *in-themselves* to the point of impotency. Having flattened the world to the point where it is bereft of both things and no-things, and caring not for any of them, *flush ontologies* let the world slip through their fingers into a state of general decomposition.

But to say that things decompose is not to imply that they cease to exist, but rather that they exist as 'intense' variations in time. Garcia's conception of a doubly locatable time as "the continuous and intensive variation of presence", is derived in part from the raisin-bread dough as a model of time,[102] but also clearly speaks to Bergson's conception of duration as "a continuous and qualitative multiplicity" (Garcia, *Form and Object* 184; Bergson, *Time and Free Will* 105).[103] In Garcia's model, while the past, present and future are qualities of difference constantly being stretched out so as to reorder their intensity, they do not lose their quantitative or classificatory dimension. Thus, time becomes a doubly localised event. This is significant because it allows Garcia to maintain an uncompromising flatness and still discriminate between things without contradiction or loss of the potency of the event.

If, as stated earlier, Meillassoux seeks a becoming without the contingency of there necessarily being anything to come, then Garcia seems to desire a becoming so blithe that nothing ever happens. Has non-correlationism – taken to this extreme – simply pushed away the *in-itself* to such an extent that it is, for any *practical* purposes, inoperative; or is there some way forward from here? The question we have failed to ask with regard to Garcia is that of the contingency of becoming – but this, of course, is the point of 'compactness'.

Reconsidering the implications of this idea, we might recall that "a thing is outside itself, in the world, and an object is in another thing" (Garcia, "Crossing Ways" 18). The value of 'compactness', and the reason why it need not care, is that relationality and becoming are inherent in its nature. A 'compact' thing is always a thing in relation to another thing, otherwise it is not a thing in-itself. But again here, there is a qualitative dimension to take into consideration. While things can be said to be *in* things, this tells us nothing of the nature of that relationship. Garcia explains this as the function of the event: "Events are the ways in which things belong to other things" (*Form and Object* 172). But more than this, it is the quality of events – the *relations* between things – that brings-forth things: "Whereas an object is present (or absent), an event self presents (or self-absents)" (Garcia, *Form and Object* 173). This self-presenting of course speaks directly back to other non-dualist models such as: the substance/substance-less events of Leibniz's monad, the self-presencing event of Burnham's self-meta program, and the spatio-temporal becoming of Goodman's erleb, but with a significant difference. Whereas these earlier models were plagued by the contingency of sufficient reason, the 'compact' event is not. While the subject predicate in every object representation is relieved of its primacy by the *un-reasoned* flattening of the ontological plane, the *no-matter-what* irons every crinkle out of ontology. *Flush* in the event, *no-matter-what* things are always already in becoming and *unreason*.

10.2.5 **Always Already**

Although Garcia is typically associated more with Speculative Realist ontologies and sees himself as being closer to Harman than Meillassoux,[104] the reading of *Form and Objec*t given here tends to align him with a vitality that is more typically associated with New Materialism. Before returning to the question of how this speculative 'compact' ontology might be resolved in practice, I want to consider how Garcia's '*no-matter-what'* might relate to New Materialist thinking. This in turn will further clarify the position regarding practice.

Having assiduously avoided getting caught up in speculative material/realist distinctions, it now seems relevant to address these within the parameters defined by the question: how do New Materialist ontologies relate to the causes of *necessity* identified as operating in the 'no-matter-what'? Again, through his adamant rejection of the 'vibrancy' of Materialisms, Harman proves a useful protagonist. More specifically here, his 'attack' on Jane Bennett's *Vibrant Matte*r serves as a useful encapsulation of the larger tension between these two philosophical positions ("Materialism" 97).[105] Of course, in setting up such a combative dynamic there is both the risk of generalising and of polarising what are largely sympathetic causes. Even if the "rubric of speculative realism" is splintered, as suggested in *Speculative Aesthetics,* we can, as Robert Jackson asserts, at least consider these factions as being unified by a common opposition to correlational thinking (Beech et al. 1; Jackson).

Perhaps, then, it is only a symptom of a robust academic discourse that causes Harman to deride materialism in general as "one of the most damaging philosophical temptations of our times", and to promote an "object oriented philosophy that insists on the rights of *form*" ("Materialism" 94). Harman's treatment of the term 'form' here is instructive, as it effectively marks what I take as being the most

significant distinction between his *internalised* object and New Materialism's *externalised* agency. We can forgo the elaborate historical analysis of form that Harman offers, as we are not interested in these genealogies right here, and clarify exactly what Harman means by *form*.[106] Harman's tendency to think of things in terms of dualities, while ultimately limiting, is again quite useful. Taking 'form' to quite literally be that which has "some kind of shape – usually a visible one", he lends substance to his objects. Even though the objects in Object Oriented Ontology are as much conceptual as physical, Harman needs to assert their ontological primacy so that they can withdraw inside the quadruple object. Again revealing his dualist tendencies, he distinguishes these 'objects' from 'matter' – defined, in opposition to form, as being that which is 'absolutely formless" (Harman, "Materialism" 2). It is this formlessness, of fluctuating intensities, energies and relationships, that Harman perceives as being materialism's 'object'.

In the above quote Harman is making direct reference to Bennett's "vital materialism" – in which objects are taken to be "swirls of matter, energy, and incipience that hold themselves together long enough to vie with the strivings of other objects, including the indeterminate momentum of the throbbing whole" (Bennett, "Systems and Things" 227). Objects, then, are things out-there always in relation to other things, rather than matters of form as prescribed by Harman. There is no need to labour the point here – but to be clear, Bennett's vitalism, like Barad's agential formalism and Haraway's material-semiotic actor, are forms of relational becoming that with different commitments shift ontological emphasis away from the sort of form Harman is committed to.[107]

Responding to Harman's attempt to 'destroy materialism',[108] Bennett frames the debate in terms of the mereological prioritisation of parts and whole – of object and relations. Object Oriented Ontology, she points out, is a fundamentally "*non-relational* conception of the reality of things" (Harman, "The Well-Wrought" 188). Although ceding that Object

Oriented Philosophy is a more rationally defensible position, she also accuses Harman of playing hide-and-seek with his 'objects' (Bennett, "Systems and Things" 226 & 225). What he is hiding in these matryoshka doll objects, she suggests, is a human subjectivity that seeks to repress objective reality – presumably a reality in which things are in relation to each other (Bennett, "Systems and Things" 230). This is quite a charge against an ontology premised on an anti-correlational argument. While I have certain sympathies for her critique, this is not the key point of interest here.

Rather, I am interested in resolving a position regarding the object-relations argument which, I suggest, is premised on an internalisation or externalisation of in-itself. In object oriented ontologies the real object moves away from us into an infinitely distant inner core that is in-itself ultimately inaccessible; whereas in relational ontologies the object is out there in the world already "*form[ing] noisey systems or temporary working assemblages* which are as much as any individuated thing, loci of affection and allure" (Bennett, "Systems and Things" 231). Although I am inclined to sympathise with Bennett's rhetorical question about whether there is a "need to choose between objects and relations", as this aligns more readily with Garcia's un-reasonble no-matter-what, there are some issues with the conception of relations as *assemblages* that need to be addressed ("Systems and Things" 227).

Although disrupting the flow of the discussion slightly, there are two issues arising from the reference to 'assemblages' in the preceding quote that need to be addressed. The first is in relation to what is admitted as a discrete entity under the framework of Goodman's nominalism. As an enrichment of "'assemblages' borrowed from Spinoza and Deleuze and Guattari", Bennett's assemblages can be broadly taken as confederations: "ad hoc groupings of diverse elements" that are mode-ified as they form alliances (Bennett, *Vibrant Matter* 23; "The Force of Things" 353). What this suggests, and is further clarified throughout

Vibrant Matter, is that assemblages form sets and subsets of heterogeneous individuals. This conception of relational assemblages does not fit comfortably with the model of differentiation taken from Goodman which rejects classes as discrete entities. The construct of assemblages does not devolve the parts into a whole in the same way as Garcia's more radical *no-matter-what*. *No-matter-what* survives the test of differentiation because it provides a structure for becoming that is unreasonably insistent on both objects and relations as in-itselfs. With regard to Bennett's earlier question, then – there is no need to choose between objects and relations – an assemblage does not do this, at least to the extent that it allows for relations to become differentiated. Assembled entities always maintain a dual allegiance to themselves and the set to which they belong. In this respect, New Materialism is clearly at odds with the treatment of the digital being pursued here.

The second point to make should be self-evident given the first, and relates to the reason for limited engagement in this text with theories of assemblage: specifically, in the context of Bennett's argument regarding Spinoza, and in turn Deleuze and Guattari. Although Bennett's approach to quasi-object systems and relations is somewhat sympathetic to that being promoted here, the differences evident in the treatment of what constitutes an individual – an *in-itself* – also speaks to the general exclusion of assemblage theories from this analysis. This is not to say that these do not have merit or could potentially inform the discussion, but rather to acknowledge that in two significant ways the line of inquiry followed here is distinctly different. In keeping with this train of thought, it is interesting to note that, perhaps with the exclusion of Bolt, Heidegger tends to be less central to New Materialist positions, and conversely, Deleuze tends to be less significant to speculative, object oriented arguments. This observation is supported by Harman who, always dependable when it comes to dialectic arguments, pits Deleuzian hooliganism[109] against Latourian *sui generis,*[110] in the quarrel over the "isolation and interbreeding of individual things" (*Prince of Networks* 99-

118). Although Harman's point of reference is Latour,[111] the relevance here is that Object Oriented Philosophies tend to dismiss Deleuze as 'passé'.[112] Harman's need to assert the incompatibility of the Deleuzian virtual and the concrete seems to be motivated by a desire to promote the 'matter' of object oriented ontologies above all else.[113] While this readily translates into the relationship between Object Oriented Ontologies and New Materialism, it has also been a deliberate strategy here to keep the 'virtual' at arm's length with regard to 'the digital'[114] – not because of a desire to conform to theoretical pedigrees, but because of the way this inquiry is committed to expanded *sculptural* practices rather than new media discourses. In fact, adopting such narratives would, I suggest, only have clouded the vision driving this inquiry. Although post-object artists such as Allen and Dadson clearly make use of the moving image, their approach is resolutely sculptural, or perhaps post-sculptural, in the sense that within the flattened material repertoire of expanded practices, the moving image leaves grease marks on the hand just as the lead in Richard Serra's *Hand Catching Lead* (1968), *does.*[115] In such works, the material interplay between the film and the body of audience is seen to be operating in opposition to the Deleuzian 'virtual', in that it is seen as being concerned with the 'actual', as opposed to the "real without being actual" (Deleuze & Guattari, *Thousand Plateaus* 94). There is, then, a clear agenda to disengage from virtual narratives, and to approach such 'media' from the context of conceptual sculptural practice, rather than new media.

Already, though, this brief but necessary qualification has been a departure from the main line of inquiry being pursued here: that of addressing the relationships between the *no-matter-what* agency of materialist relational ontologies and the object oriented commitment of realist ontologies, so as to position causal necessity. With Harman's help, the distinction between ontologies of 'form' and ontologies of 'matter' have been interpreted as the key difference between the internalisation and the externalisation of the *in-itself*. In relational ontologies such as

Bennett's, it is suggested that greater emphasis is placed on an *in-itself* that is outside of things in the messy, emergent relations between things. To borrow Barad's words, "'material' is *always already* material discursive" (*Meeting the Universe* 152, my emphasis). Whereas in ontologies of form – such as Harman's – the in-itself is always already elsewhere as it endlessly draws away from other objects. Both of these, I suggest, are inadequate responses to the question of necessary cause, for diametrically opposed reasons.

As argued earlier, the quadruple object perpetuates an occasionalism by offering nothing other than 'allure' as the motivation for a vicarious causation. Vicarious indeed, because allure's *special* quality is ever elusive – even, it seems, to Harman: "Allure is a special and intermittent experience in which the intimate bond between a thing's unity and its plurality of [specific qualities] *somehow* partially disintegrates" (*Guerrilla Metaphysics* 143, my emphasis).[116] Somehow, *somehow* does not really provide sufficient reason. It doesn't tell us how allure seduces the objects in the world into 'sensual' encounter with each other. To bounce back Harman's own words to him, allure is nothing other than a "meddling god who intervenes in every least event in the universe" ("Time, Space, Essence" 2).

On the other hand, vital matter is always already *just doing it*! Never excused from the world, agency is an 'always on' given. As Barad suggests, the agenda of relational materialism is not just to pose an alternate causal dynamic but to establish an altogether different understanding of it (*Meeting the Universe* 179). Although Barad's argument on behalf of vital materialism is compelling, it is still vulnerable to Meillassoux's critique of correlational reason. Particularly here we can point to Barad's discussion of what gets included and excluded in the iterative becoming of things. Exclusion and thus inclusion are, she suggests, a matter of "the changing condition of possibilities of changing possibilities" (Barad, *Meeting the Universe* 179). But change – although

perhaps lacking the metaphysical motivation necessary for reason – is not the equivalent of unreason. In fact, the opposite is true. Interpreting the above statement to read as *the changing state of change,* we see that change has no option! Whereas unreason can quite reasonably result in reason, change is always change. Stuck in an undecidability problem, change can never not change because it is always predicated on change. Change, like reason, allows no room for anything else. Thus failing the test of the abandonment of becoming,[117] relational ontologies seem as causally inadequate as object oriented ontologies.

But even if we were to admit relational change as the equivalent of unreason, in the constitution of an *in-itself,* change still appears to fall short of the decomposed intensity of Garcia's events. New Materialist relationality is vulnerable to the same question that Sutherland asks of Meillassoux: in the end, is relationality really able to extricate itself from the contingency of reason? Bennett's suggestion that we might toggle "between both kinds of magnitudes", between objects and relations, is not much closer to our objective either ("Systems and Things" 227). In fact, if anything it seems to compound the problem because now there is not only the question of a reason for deciding between relations, but also for deciding between relations and objects. Having it both ways is not always an advantage. This is, perhaps, the reason why Garcia argues for the nonexistence of both – *not matter what*.

Although Garcia's causal model is perhaps limited by a formal approach – formal in the conventional use of the term – its austerity is the reason for its effectiveness. It offers nothing and holds no optimism about whether anything should happen or not. But in this *flush ontology,* the potential for everything to happen is inclusive of the possibility that nothing happens at all. It could be argued that, having completely stripped away the contingency of existence itself, Garcia's nihilism is so absolute that causation itself is redundant. However, the no-thing that no-matter-what

leaves us with is no no-nothing, rather, it is the potential of everything in which time points to the need for something.

10.3 **Un-reasonable Indications**

In the preceding analysis of contemporary non-correlational ontologies, it has been suggested that neither object oriented 'form' or relationally oriented materialisms provide grounds for an in-itself independent of human agency. Both are seen as susceptible to occasionalism and that, as such, the *in-itself,* for itself, remains out of reach. While Meillassoux's *un-reason* has identified a way forward, it is Garcia who is radical enough to make a clearing in which nothing at all is contingent, including the *in-itself*. Only from this – the weakest possible position, where the *in-itself* accepts the possibility of its own failure – does it seem feasible for it to be released from all contingency. Here *perhaps* the *in-itself* is not without the possibility of not being *in-itself* (Garcia, *Form and Object* 63).

Within the formal philosophical tradition of Garcia's argument,[118] this eversion seems to formulate a solid philosophical proposition for the way out of the correlational circle, while conveniently sidestepping representation and occasionalism on its way. But, as Garcia notes with regard to time, this doesn't really get us much closer to a commonsense determination of being *in-itself* (Garcia, "Crossing Ways" 21) although, it seems, he has little interest in departing these 'formal' constraints to considering the 'common sense' of practice.

The question to address, then, is if the radically *flush* ontologies – presented here as a hybrid of Meillassoux's *un-reason* and Garcia's *compact* object – can be practised in such a way that *in-itself* has a contingency weak enough to be itself in practice. Taking practice, as earlier defined through the becoming of the event to be the *in-itself:*

what would constitute such a *flush* practice? If the *flush thing-in-itself* is the weakest, least determinate way that something can be defined, how can it be practised? Practice would seem to need to be both more and less than what it is – perhaps an un-practice or an un-indication!

As it stands, *formal indication* provides a workable resolution to the question of 'digital practice', one that might even be slotted into the relationality of the New Materialist discourse as already suggested.[119] Indeed, such ever-emergent relational dynamics clearly provide a viable response to the question raised regarding a method for 'forgetting the object but not the *work-of-art*'.[120] However, to be satisfied with relational solutions such as this would mean being wilfully blind to the limitations of conceiving of 'the digital' in the correlational terms that Meillassoux highlights.

It is, then, both unavoidable and important that the practical efficacy of *formal indication* is reconsidered in the context of *flush* non-correlational ontologies. We should be clear, however, about the aim for doing this. It is not to force art practice into the speculative mold of non-correlationism if it does not fit. But, rather, the purpose is to test the practical robustness of *formal indication* against the possibility and challenges of these more radical ontologies. Thus, while it might be conceivable to come to a more radical understanding of the digital in art practice, it might also be the case that the speculative ontologies themselves are informed by practice.

As challenging as it is to unravel, Meillassoux's argument is compelling. But we should remember the point touched on earlier by Amanda Beech in the introduction to the *Speculative Aesthetics*: there are "irresistible gains for art here", because Speculative Realism promises to make "possible a new art 'after philosophy' in which a vacuously general concept (object, thing, or material) can mysteriously transform any stuff whatsoever into an aesthetic and philosophically significant

experience" (1-2). If the task of pursuing an un-practice with the equivalency of un-reason seems almost preposterous, we should also remember Meillassoux's assertion "that one can reason about the absence of reason", and thus not dismiss the proposition of an un-practice or un-indication too quickly. It is useful, then, to first acknowledge points of convergence between *formal indication* and *un-reasoned compactness*.

Meillassoux's argument is that the absolute determinacy of things in-them-selves is limited by *our* facticity – by the impossibility of thinking of something outside our own thoughts. Thus, reinforcing the position outlined earlier regarding knowledge production,[121] the more explicitly something is defined by us, the less it is differentiated from us as a thing in-itself. In order to liberate things from this determinacy and yet still be able to define them in the weakest possible way, we need to proceed un-reasonably by not committing to either their prior existence or non-existence.[122] Compacting objects in this way would thus entail making *un-reasonable* indications towards some thing-in-itself, in order to practise the digital. *Indication* thus practised would need to be weakened as much as possible and be bereft of necessary reason.[123] So much so, that it might have neither subject nor reason to indicate, and would be without commitment in-itself.

The reading of 'indication' here is further informed by its etymological grounding in the Latin *indicātiō* which, stemming from *dicatio,* means to make "a formal declaration of intention to become a citizen" (C. Lewis). The concept of *citizenship* here clearly speaks to the relational ontologies discussed in the preceding section.[124] Such *citizens* might declare themselves through such indications, but also maintain their *formal* integrity in as yet unrealised statements of *intent* declared, rather than in facts determined. An indication in this sense might be seen to declare 'compactness' by enacting intent without full commitment. As a statement of intent rather than fact it might be said to operate with the

inexactitude of Haraway's 'trickster': the methodological double movement of practice which seeks to identify the known through the unknown.[125]

But more significantly than this parallel, we might also think about *compacting* as performing a function not dissimilar to that of Heidegger's 'clearing', in that it provides a 'space' of potential in which the *how* of formal indication *might* eventuate.[126] (Note that I am careful not to suggest indication is *thrown* into this *clearing* in a Heideggarian *way,* because this would suggest the same extant contingency.) A weakened indication would thus operate *as* a space through the un-reasonable condition of its being compact. Returning to Garcia's definition of *compactness,* we can see that this happens not because of indeterminacy, but rather because of the absolute *equivalency* – an equivalency posited between what a thing is and what it is not, as realised by the no-matter-what of the compact object. Indication might then function as "an equality operator, allowing us to reach a point where no-matter-what is something as much as another thing" (Garcia, "Crossing Ways" 21). If we can think about the *clearing* as being the potential of the space defined by the hyphen in da-sein,[127] then this seems directly comparable to the space of equivalency taken as the "difference between that which is in this thing and that in which this thing is" – this being Garcia's definition of a thing (*Form and Object* 13). Having made these connections, other associations now open up for us.[128]

In the earlier analysis, *Beyng* was discussed in terms of the *event* as a coming-forth in the *clearing* that is created in the space between being and there (da-sein). It was described as an unstable, emergent 'how' that was prepared to wait without predetermination of 'what'. Again we can read Garcia's compact object in similar, although significantly different, ways. *The compact* object, like *Beyng,* is positioned between two things - between what-it-is and what-it-is-not, or between being and

being-there. In this they also share other similarities that centre on the temporality of becoming that is articulated by Garcia as the *event* – the way in which things self-present. Heidegger, too, uses the construct of the *event* as a space of potential in which *Beyng* is brought-forth. Of course, the *events* space also has qualitative dimensions which, for Heidegger we know, is the unstable willingness to wait; and, although Garcia doesn't state it in these terms, the compact's *no-matter-what*, careless attitude demonstrates a similarly temporal indifference.

In both, there is a sense of the *event* as something containing its own possibility; almost like a time complexity algorithm conceived of earlier with regard to Goodman's erleb,[129] or like the duration of the hyphen space of vector time perhaps – although, unlike Garcia's more radical, doubly locatable time, these earlier constructs insist on the contingency of internalising time. This temporal emphasis has, of course, in different ways been a consistent aspect in several of the mereologies discussed, but also with regard to practice, where the practice of *beyng* is taken as a mode of knowledge production through the function of *bringing forth*. The temporality of *bringing forth* is based in no small part around Heidegger's treatment of the *event* as an *inception* that invents or projects the truth in its becoming.[130] Despite there being multiple threads which could be followed back through previous facets of this thesis, it is Heidegger's inceptual dependency that most clearly speaks to the potential of non-correlational indication.

Inceptual thinking, as explained by Richard Rojcewicz and Daniela Vallega-Neu, "goes back to the Latin 'capere,' which means to catch. Inceptual thinking is a thinking which, as it were, 'catches' what is thrown to it. It 'catches,' or takes over, the 'throw' (Zuwurf) of be-ing, and in doing so inceptually unfolds this throw" (Rojcewicz and Vallega-Neu in Heidegger *Contributions to Philosophy* 33). While this definition encapsulates many of the corelate-juxtapositions inherent in the self-presencing aspects of both Garcia and Heidegger's treatment of the

event, what it leaves unsaid is that, for Heidegger, only "gods and humans are thought [of] inceptually" (Rojcewicz & Vallega-Neu, in Heidegger *Contributions to Philosophy* 45). Or, again as stated by Heidegger, inceptual *Beyng* is "the kind of Being that belongs to *persons*" (*Being and Time* 28). In this, Heidegger is clearly unable to leave his phenomenological inheritance behind, and so his indication remains contingent on human being. Or, as Hui neatly explains it, the phenomenological "Absolute is, not an absolute Absolute but a differentiated Absolute" (10). If we are prepared to accept this, then there is no need to go any further and we can simply conclude that formal indication provides an Absolute method of practice through which the digital can be brought forth *in-itself*.

However, this would also mean rejecting Meillassoux's analysis of Heidegger as a correlational occasionalist. Given that Meillassoux's critique of correlationism represents an almost single-handed "attack on virtually all of post-Kantian philosophy", this might be a reasonable and certainly safe approach to take: what is so compelling in a single argument that justifies going against the entire trajectory of post-Kantian philosophy (Harman, *Quentin Meillassoux* 104)? However, with regard to the question of the differentiated digital, non-correlationism is not so easy to pass over. Again, to make this clear: regardless of how you approach it, the difficulty with correlational thinking is that it assumes an *in-itself* that is unknowable, or is at least contingent on human being.[131] Correlationists are quite satisfied with this solution - after all, all Speculative Realism can offer as an alternative is purely speculative.

The problem here, though, is not the *event*, *bringing forth*, *durational time-complexity* or indeed *formal indication*. Rather, the difficulty seems to be the contingency of reason – or, more radically, if we accept Garcia's compactness, the contingency of differentiation itself. If we could remove the contingency of human being from *Beyng,* what sort of practicable proposition would we have left?

10.3.1 **Speculative Indication**

Earlier it was argued that things-in-themselves could only ever be practised, and that only practice itself could ever be discrete.[132] While this holds true within correlational arguments, it is challenged by the more radical *flush* ontologies that insist that practice itself is always the practice of a subject. Although this must be applied equally to all practical relations, both human and non-human, in the context of this thesis we should articulate this as meaning that art practice is practised by humans and is therefore not an *in-itself* but a *for-us* as either artist or audience. Art practice conceived of in this way needs a reasoning subject. Although perfectly acceptable to correlationists, formal indication understood in this way is thus *not* a method that provides access to the *in-itself* for the non-correlationist.

This is the argument that Meillassoux makes against correlationism. However, *flushness* – as a result of *un-reason* and *compactness* – seems just as practically inept as it leaves indication formally bereft of necessity, entropically inert or hesitant. In order to isolate the thing-in-itself from our ability to think it, philosophy seems to have deprived the *in-itself* of the practical potential to become.[133] As *compact* things in themselves, the digital and the artists are thus left apathetic in their causal appetite, for even a digitally differentiated practice would seem to need some *indication* about what to do.[134] What is missing from practice is a sense of the *flushness,* such as that evident in the doubling function of *unreason* and *compactness* in philosophy. In looking for a way to practise such an *in-itself,* it would seem necessary to maintain this double function: to catch practice's own throw of reason, in the formulation of a *flush* indicative proposition.

There is, of course, a risk that whatever we attempt in this regard is compromised at the outset by its being thought, and thus is contingent in *beyng*. Again we become entrapped in the hermeneutic or

correlational circle of the Klein bottle. Meillassoux seems well aware of this problem, but is also adamant that we can refute this *performative* contradiction, arguing that "if the very idea of reason is subjected to a profound transformation, if it becomes a reason liberated from the principle of reason – or, more exactly: if it is a reason which liberates us from [the] principle of reason" (Meillassoux, *Time without Becoming* 29).[135] It is not so much that we need to abandon formal reason, then, but that we need to find a means of working with its absence. The method Meillassoux promotes for fostering this is *speculation*.

In fact as suggested by its prominence in both *Speculative* Realism and *Speculative* Materialism, Meillassoux's preferred term – speculation – is, I suggest, central to the non-correlationalist argument.[136] Again, echoing the sort of doubling that is evident in both Meillassoux and Garcia but also as noted elsewhere throughout this thesis, speculation at once refutes the possibility of the absolute, and functions as a method of realising it. This is possible because Meillassoux directly connects speculation to facticity through the term *spéculation factuale*: "speculation which is grounded on the principle of factuality" (Brassier in Beech et al. "Speculative Realism" 432). Here factuality is used to define the necessity of facticity, "the non-factual essence of fact" or un-reason (Meillassoux, *After Finitude* 129).[137] Given a dual reading, speculation is understood in correlational terms as being the limit that reason imposes on the *in-itself* which means we can only speculate about what is. On the other hand, when tied to factuality, understood in terms of unreason, speculation becomes a method of realising the possibility of *in-itself*.

The double take on the *in-itself* that speculation affords is significant because it allows Meillassoux to assert un-reason through reason.[138] This is why it is incorrect to interpret Meillassoux as simply rejecting correlationism. Despite his critique of it, he never refutes the correlation argument – after all, how could he 'reasonably' do so and still make a logical argument? The strength of his position is that he seeks to

destabilise it from within its own reasoning. Speculation is a key method for doing this as it allows for a "reason which liberates us from the principle of reason" (Meillassoux, *Time without Becoming* 29).

While Meillassoux effectively uses speculative reasoning to address the problems of correlationalism, 'the speculative' is also a defined philosophical term that we should briefly address, specifically with regards to Alfred North Whitehead's *Speculative Philosophy*. What is significant about Whitehead's treatment of Speculative Philosophy is that he attempts to *formalise* speculation as a method of knowledge production, one in which concepts and schema "presuppose each other so that in isolation they are meaningless" (*Process and Reality* 5).[139] Bringing a different emphasis to Goodman's *world version* 'rightness' in which semantic content and the syntactical system are concomitant,[140] Whitehead constrains the limits of knowledge so that "non entity can be conceived in complete abstraction from the system…" (*Process and Reality* 5). Schemas, or as we have been calling them, syntax, thus define what is 'necessary' to know, and anything falling outside those terms of reference is deemed unknowable. This 'necessity' that Whitehead speaks of, places *universal* contingency both on what needs to be known, but also ultimately on what can be known.[141] The only limit that universal 'necessity' places on contingency is its own universality: there can be nothing to know outside of everything there is to know. Thus 'necessity' becomes like the set of all sets: every possibility is necessarily contingent on everything that is possible. Whitehead's speculative proposition thus becomes a method not dissimilar to Meillassoux's 'contingency'. If it is "contingency *alone* that is necessary" for Meillassoux, then speculation seems to be all that is necessary for Whitehead (*After Finitude* 130). Speculation like un-reason is open to the reasonable possibility of what it is not or does not know.

But further to this, Whitehead also usefully suggests that what comes to be known is first 'practised' as experience (*Process and Reality* 19-22).

Without unpacking Whitehead's procedural thesis further, we can see how – with the exception of class acceptance – his speculative schema coincides with many of the concepts already developed by other means. This comparison is clearly evident in Whitehead's *Categories of Explanation*, where the 'actual' world is conceived of as a process of becoming: "That *how* an actual entity becomes constitutes *what* that actual entity is…" (*Process and Reality* 34).[142]

While useful to note this convergence, we need not re-engage with these arguments further. It is enough to note that the significance of Whitehead's reflection on process is that it maintains the *formality* of speculative propositions[143] – not in the sense of them being some wild flight of fancy without reason, nor some 'calculated' venture with probable outcome, but rather in the sense that it allows us to *formalise* practice within the contingency of un-reason. Speculation is the possibility of conceiving of the what-is beyond sufficient reason. To roll Meillassoux's die again, it is the conception of the seventh side of the dice resolved in the practice of throwing.

What is especially pertinent about Whitehead's formalisation of speculation its that it defines a particular type of formal method that can be used to inform Meillassoux's argument. Speculation for Whitehead is a logic construct. That the logic of the speculative method in Meillassoux's facticity is un-reason, does not make it any less formal. Thus I suggest Speculative Realism can be articulated as Formal Realism by speculative method. Returning to the question of how formal indication operates in speculative realist and materialist contexts, it is helpful to maintain a consistency in the use of the terms. Thus formal indication can be further qualified as an indication by speculative methods: methods that I call *Speculative Indication.*

Although *Speculative Indication* seems a strange combination of terms, this is only the case if we forget that speculation is itself a formal method

and is, in fact, shorthand for *Formal Speculative Indication.* As proposed by Whitehead, formal logic and speculative processes are not in conflict with each other. Thus we have not really changed the method proposed earlier, but further qualified it to meet the demands of a *flush ontology*. Again, the value of this is that it escapes naive correlational assumptions in which the *in-itself* can only ever be differentiated for us – only ever be digital *for-us*. This allows us to consider a *compact* method of indication that maintains the speculative doubling of un-reason. *Speculative Indication is thus conceived of in this thesis as a method through which a differentiated digital can be revealed in the event of practice as a thing-in-itself of itself, and not for us.*

But how would this operate and what would it look like in practice? If, as established formal indication is a 'pointing to', that is done in such a way that the audience maintains the agency of revealing,[144] what would it mean to speculatively indicate? Even though *Formal Indication* brings-forth knowledge of an object in the practice of revealing, it also assumes some prior existence of that object; despite not being revealed as yet, the subject must assume there is something to point at, or bring forth. At the very least there is a conception of a space – a hyphen space – as a contingency, a thing being differentiated in-itself. This in-itself is not a compact thing in Garcia's sense but in the sense of Heidegger's *Beyng*. As discussed earlier,[145] formal indication is the method that creates a clearing in the *fore-structure* of Dasein's being-in-the-world already. Such becoming always happens in a given thing and is, thus, rejected by Meillassoux as being a naive form of realism.

Indication alone, then, is *not* sufficient to release the subject from the contingency of thought so that it can be discrete in-itself. This is why *formal* needs to be qualified as *speculatively formal* because it reasonably removes the contingency of reason from indication. In pointing towards something, formal indication reasons that there is an *in-itself* to point at, even if what that in-itself is, is not known. To *speculatively*

indicate is to point without reason to assume that there is a not-known-in-itself to point at. As philosophically 'reasonable' as this may be, the idea of putting this into practice seems preposterous! If the idea of indicating towards something that is not fully defined seemed illusive, then *speculatively indicating* to it, if not inherently contradictory, seems as far beyond practical application as it does beyond reason. But having come this far, we should test this out and try to conceive of how this might manifest in the *work-of the artist*.[146]

10.3.2 **Un-making News**

Echoing the approach taken earlier with regard to the *work-of the-artist*,[147] we can again look at Allen's performance of *News*, in order to consider how practice might operate as a *speculative indication*. As described earlier, this work consists of enacting a simple, self-instructed action in which the artist intently crumples up and flattens out a single page from a newspaper. In the reciprocal action, formal indication clearly provides the reason that drives the work into becoming, as a 'material thinking' that throws the work towards its conclusion.[148]

The self-instruction – discussed earlier as a form of notation or script – is seen to operate as a formal indication because it declares what the artist is to do, but not what will happen when they do it. Engaging this in a non-correlational critique, however, we see that there is a correlation between the instruction and the action, between thought and the world. Even though what happens within that action might be less determinate, the script as intent itself provides the necessary reason for the action. Putting this directly into Meillassoux's words: we cannot think of the "subjectivity [of the script] and [the]objectivity [of the action] independently of one another" (*After Finitude* 8). The action *in-itself* cannot be thought of without the script being implicated in it.

In order to think of the work in *speculative* terms, rather than getting caught up in the intra-actions between script and the action, we should look at the meta frameworks of the script as part of the site of necessary reason. In this context, the 'speculative-meta' – that which is beyond the reason of meta frameworks – speaks to entities outside the reasonable possibility of its being: outside the artist's determination of the script. Formally, if the speculative is outside of the reasoned, then it is meta to reason. Indeed, Whitehead speaks to this speculative-meta relationship in the concomitant pairing of semantic content and syntactical system. While we also see this reflected in Goodman, it is Burnham who mostly clearly articulates this meta function in his 'systems thinking'. Systems thinking, as we recall, is the term Burnham uses to describe the way in which self-meta-programs are capable of reaching beyond themselves to draw in content, in order to maintain semantic vitality.[149] Burnham uses the term *negentropy* to define this process: "Negentropy is the ability of information to increase the structure and potential energy within a system" ("Real Time" 50).

What we see in the conception of negentropy is a balancing between the unpredictability of external information, and the ordering of it internally within the structure of the work. This, I suggest, is similar to the relationship between unreason and reason, such that we can conceive of speculation as *part* of the negentropic event[150] – as a meta-event that is outside of the reason of the event – such that the necessary possibility of unreason is maintained. If, as explained earlier, negentropy and entropy are inverse measures of the same thing, then they have a similar concomitant relationship as un-reason and reason: un-reason is a statement of the lack of reason, and reason is a statement of the amount of reason present. Absolute fact thus becomes maximum-reason and, like maximum-entropy, it defaults to a state of inertia in which it is unable to produce new knowledge. Maximum-reason has no need for more reason. If Meillassoux's purpose in proposing the contingency of un-reason was that it allows for reason, then

negentropy and entropy operate with a similar dynamic: the level of disorder in a system is a condition of its ability to create order. In this way, speculation is firmly committed to a meta-position in the world.

How, then, should we understand this speculative-meta relationship with regard to the practical example we have taken here, Allen's *News*? For Burnham, the meta-frameworks of the artwork are the art world 'institutions' that surround it. He understands these speculative entities as "components of the work of art" ("Real Time" 50). While we can certainly see this operating with regard to the original 1976 *News* through such things as Post-object Arts socio-political aspirations,[151] we can also see how the artwork is changed by the meta-frameworks in Harvey's 2015 re-enactment. But I also suggest that these meta-speculative frameworks surround the practice of making art in more pragmatic practical ways – the only difference being the *intensity* with which they are present.[152] *Every part of such practice is immersed in a myriad of speculative possibilities that unreasonably determine the possibility of the reason of the artwork*.

Such speculative unreasonableness is materially evident in the newspaper Allen uses: it is, I note, the front page of 'today's' newspaper – the1976 New Zealand Herald in fact, one of less than two hundred and fifty thousand in circulation that day.[153] In Harvey's 2015 version it would have still been 'today's' Herald, as prescribed by the self-instruction, but a different 'today', determined by the scheduling of the exhibition within the institutional framing.[154] Not least the black and white of the 1976 paper is in contrast to the full colour feature page of the 2015 edition. But so, too, has the size of the spread changed[155] and likely the ink and paper quality. The ink does not rub off on the artist's hands as readily, and the paper offers greater resistant to disintegration in the practice of the work. We could undoubtedly go on speculating about the unreasonable meta conditions surrounding the material practice of the work, but there is no need.[156] The point is that while

practice provides an indication, it operates within a meta-framework of speculative possibilities – not in the sense that we need to guess about what they might have been, as we have to some extent here, but in the sense of unreason, meaning that these speculative-meta possibilities are not contingent upon our knowing of them. The unreason of the world is the contingency within which the reason of practice operates.

To assume that practice operates on the contingency of reason is to assume that it knows all possible reasons, and as shown in the case of the newspaper, this an un-realistic expectation. Practice operates in an unreasoned meta-speculative framework – in fact, it must do in order to maintain its negentropic potential of indication. Without this it is the mere process of the already known, and not a bringing forth of new knowledge. Knowledge must be practised from the contingency of unreason, otherwise it is not new. And, as such, following the earlier argument via Schrodinger, knowledge slumps into a rather unattractive lump of inert matter-of-fact.[157]

An important point to stress here is that, while I have made comparisons between the meta-speculation and negentropy, this has been focused on positioning unreason as a meta-entity. The speculative is simply that which is beyond the reason of practice, or is not reasonably known to practice. I have been careful not to suggest that speculation performs the negentropic function of reaching out. This, as discussed earlier, is the function of indication.

Having positioned speculation as an unreasoned meta to practice, we need to understand more clearly how it works with indication. Here, rather than Meillassoux, it is Garcia's compactness that is insightful. In particular, it is helpful to focus on Garcia's statement that "A thing is nothing other than the difference between that which is in this thing and that in which this thing is", because it identifies an inside and an

outside to position things against (*Form and Object* 13). We should remember, however, that the function of compactness is to unreasonably connect these in order to position the in-itself.

Taking practice – as identified through the analysis of *Beyng* – to be a compact thing, then what is it that is inside and outside? From Burnham, we have positioned the speculative as being externally committed to practice. It is to the speculative outside that what is in practice reaches out, in order to maintain its entropic vitality. Practice is surrounded by speculation of which it has no reasonable means of knowing.[158] Speculation is outside the reason of indication, such that when indication "points us in the general direction in which we are to look", there is no assurity – beyond immediate reason – that there is anything or place to point at (Gadamer, in Kisiel 33). This is quite unreasonable. However, we see this as manifest in the transfinite meta-layers of presence that unfold in Allen's selection and handling of the newspaper. What practice ends up having to work with is not reason's alone to decide.

As a function of its being compact, practice is thus understood as the difference between the speculative meta and the indicative intra of the thing in-itself that is visualised for us in Garcia's model of the compact object. Appropriating this, we can map a speculatively indicative practice to Garcia's compact model. Garcia describes this model for us: "In our model, an arrow points inside to a circle – a thing – and then from this circle a second arrow points outside" (*Form and Object* 11).[159] Locating the speculative along with unreason in the meta space outside the circle, we can take indication and reason to be positioned inside it, practice being the line defining the difference between the two. The negentropic agency of the work is maintained by the already established function of formal indication, but this only partly determines the compact object. It is indication's compact

doubling with meta-unreasoned-speculation, that ensures indication cannot reasonably be assumed to know what it is pointing at.

Following Garcia's model, there is no visual correspondence between what the arrow of speculation looks to, and where the arrow of indication points. Like hands on a clock, the focus of the two arrows need not coincide – in fact for our purposes, they are quite probably better off looking in opposite directions.[160] This challenges the expectation that practice should be 'focused', or at least that knowledge assumes some degree of clarity about what it is pointing to.[161] Such expectations are a result of the correlational assumption that contingency rests with human thought or intent. What the double movement of *speculative indication* does is position practice in-between reason and unreason, between what is possible to know and what is unknown to possibility. Practice is thus articulated by this thesis as nothing other than the difference between speculative unreason and indicative reason. The two exist in a compact tension that maintains the entropic vitality of practice.

In this compact model, indication and speculation are mutually defining of practice, such that contingency does not rest with human facticity, as per Meillassoux's correlational critique. We might even be able to go so far as to assert that knowledge, as practice, is the difference between what is speculative and what is indicated. Perhaps this has only ever been the case for philosophy? Understood as being compact, practice is relieved of the impossibility of 'thinking' something outside of its own thoughts by the speculative's unreasonable commitment to what it is not. Whereas formal indication is inevitably bound to reason, *speculative indication* maintains its commitment to unreason, but is bound to reason by the compactness of being practised. What matters is that practice is liberated from correlation, and is able to bring forth the in-itself for itself and not for us.

10.3.3 **Un-reading News**

Having established the way in which *speculative indication* is understood to operate with regard to the *work-of-the-artist*, we should now – following the approach taken earlier with regard to formal indication – consider how this method functions in the *work-of-the-audience*.[162] Given that we have already argued the case for formal indication with regard to the *work-of-the-audience,* and articulated the construct of speculative indication with regard to *work-of-the-artist,* positioning the *work-of-the-audience* should be a relatively uncomplicated matter. However, some questions do arise around the assumed indexical position of the artist.

Earlier, when extending the interpretation of Allen's *News*, the *work-of-the-audience* was positioned as an embodied practice equivalent to that of the artist.[163] From this position, the audience was seen to be 'metaphorically' running the text of the work through their hands. The metaphor is further extended by conceiving of the entire 'sensable' body as being instrumental in the practice of revealing of the work. Based on Haraway's conception of embodied vision, the handlability, or τέχνη of practice, can be extended to other sensory experience such that the 'text' of the artwork runs though the eye as easily as it does the hand. Such practising of the work is signalled by Allen's stated desire to literally situate the audience inside the work as a mutually constituting event that is the *work-of-art*.[164] By positing artwork-audience relations as handlable relations of becoming, and prioritising relationality over the subject-object constituents as the *work-of-art*, the method of formal indication has been shown to be applicable to artwork-audience exchanges.

But in Allen's *intent* lies the issue that we must address in order to understand the speculative within the *work-of-the-audience*. In stating his desire to "bring in the rest of the body", Allen asserts a reasoned

intent which preconceives the work's indicative function: indication always proceeds with intent, no matter how vague. This is not a problem, speculatively, unless the intent serves as the factitial grounding for the *work-of-the-audience*. If human reason as artistic intent is taken as the contingency on which the *work-of-art* is premised, the *work-of-the-audience* is constrained by its correlation to the artist, and so the artwork-audience relation can only ever be considered as a differentiated event in correlational terms. In the face of such contingency, the imperative of 'getting it right' shadows the *work-of-art*.[165] Visualising the *work-of-art's* indication as an arrow pointing to what we are intended to 'get', the *work-of-the-audience* indicatively assumes a space outside itself of that we don't yet 'get'. The a priori assumption of intent limits the speculative potential of the *work-of-the-audience*.

Even accepting that such intent is indicative rather than explicit, the drive to 'get it right' posits a subject outside the event of becoming that is the *work-of-art*. Reason dictates that there is an 'it' to get, typically one posited in artistic intent. To be clear here, I am not arguing against intent. As already stated, the act of indication requires at least some intent, no matter how vague. But for a thing to be differentiated in *and* for itself it cannot be conditional upon the reasoned intent of an indicative subject.[166] Such contingency is a Heideggarian enframing that not only limits the bringing-forth of digital in-itself, as discussed with regard to the meta-tendencies of the exegesis, but, in *instrumentalising vision*, it reduces the speculative proposition to a guessing game in which the objective is to 'get it'.[167]

In order to overcome such reductive tendencies and provide for the speculative in the *work-of-audience,* we need only look to the meta positioning of it in the *work-of-the-artist*. In regard to this, the speculative potential of unreason is positioned as meta to the indicative proposition, such that what the artist ends up working with is not reason alone. Seeing as we have not privileged the artist over the audience in the practice of

the *work-of-art* – that they are *flush* in the ontological becoming of the digital in itself – then the meta function of speculation can be assumed to be the same for audience and artefact. Thus, while the indicative relation of the audience-artefact is maintained with regard to the intent of the artist, it should also be understood as operating within the meta-speculative unreasonableness of the work-of-art.

While intent holds fast to the correlational *Eye*, it is a disembodied *Eye* that, as asserted earlier by O'Doherty, insists we see only through the objectivity of reason. Although the 'white cube' of reason seeks to institutionalise vision and enforce the intent of indication, the speculative – or perhaps, following O'Doherty, the *spectative* – asks that we unreasonably *situate* the in-itself within a singularity of multiple positions.[168] Evoking Haraway's *situated knowledge* again, the situated insistence on the rigour of it subjective position – on the contingency of the unreasonable situation it emerges in – acknowledges the meta-unreason of the speculative as being that in which reason operates. The 'white walls' of reason, built to withstand the onslaught of unreason and insulate intent from the accidents of the world, were always to be taken as situated in speculative meta conditions of the *work-of-art*. The position of the audience is, then, no different from that of the artist. While the way to practise the *work-of-art* might be indicated, practice is *never* a reasonable proposition, no matter whose practice it is. In recognising that the *work-of-audience,* as practised in the artist/audience inter-relation, is a compact event defined by the difference between the reason of indicative intent and the unreason of speculation, the *work-of-art* emerges as an in-itself that is for itself, inasmuch as it can be differentiated as a digital entity.

The digital is practised in art by maintaining the compactness of that which is reasonable and that which is unreasonable. The method of speculative indication is such that it provides resolution to the *double*

bounce of the correlational circle – a recursion that otherwise throws the digital in-itself back at us as the continuity of a contingency that is for-us.

10.4 **Catch | Bounce**

The aim of this Appendix has been to consider the question of sufficient reason with regard to the practice of bringing-forth of the digital in-itself and not for-us. This was seen as a necessary question to address because of the limitation that the contingency of thought places on becoming in-itself – as per Meillassoux's correlational critique. While a number of loosely affiliated speculative philosophies have been discussed, these are seen as problematic in light of a fuller understanding of correlational charges, as in them there remains some correlation between subject and object. Such contingency relegates sufficient reason to an ulterior entity and thus denies the possibility of differentiating between in-itself and for-something-else. While the problem was anticipated in the initial articulation of formal indication as derived from Heidegger, the proposition is that what we have termed *flush* ontologies can overcome this problem by re-conceiving of *formal indication* as *speculative indication*.[169] The efficacy of this as a method for differentiating between the in-itself and the for-us is that it does not abandon thought, but acknowledges the state of speculative unreason in which thought finds itself reasoning beyond what it considers to be reasonable.

As liberating as this appears, it has some implications for how we might understand questions of relationality with regard to differentiation. Most immediately, we can see that the dynamic between the speculative and the indicative, in which the practice of the in-itself becomes, is itself a relational event. But this is not to be taken in the same way as Barad's 'always already' material event, for there are key differences.[170] Speculative unreason has no allegiance to the contingency of already:

change may not change. Whereas the vibrancy of New Materialism promotes 'always' as a contingency, unreason makes no such assumption. *Flush* ontologies are relational in as much as the reason of indication allows them to be. But because indication doubles with speculation, in practice they are also as un-relational as speculation is unreasonable. While *flush* signals an abundance, it is not an 'always on' vitality. In this sense, then, neither should practice be seen as an 'assemblage', because it holds no optimism about the availability of things to be assembled – especially not for us. Practice, as the difference between the speculative and indicative, is unreasonably accepting of the possibility of nothing as much as something.

Practice thus articulated holds a closer resemblance to New Materialist relationality than Speculative Realist ontologies, in that it rejects the withdrawal of the 'real object' as a resort to occasionalism.[171] Whereas previously such factions of *speculative ontology* have been portrayed as either external or internally committed, *flush* ontology, as informed by Garcia's model of the compact thing, is neither and both: not by virtue of some 'toggle' effect through which it alternates between them, but by virtue of being the compact difference between "*that which is in a thing and that in which a thing is*" (Garcia, *Form and Object* 11).

What initially seemed like an improbable proposition – the idea that by following Meillassoux we could practise unreason and thereby overcome our inability to think of the *in-itself* without implicating ourselves – has been resolved by the compactness of *speculative indication*. What has perhaps been lost sight of in the argument is the significance of this with regard to a digital ontology. But this is a straightforward matter of retracing our steps, as the ontological function of becoming has not changed – the method by which it is practised has simply been further developed.

The point of departure for this overall inquiry into the digital in art practice, was Goodman's definition of the digital as a *differentiated representation*. This definition is seen to present a paradox caused by the conflation of contradictory concepts: that which is differentiated cannot be represented, because representation inherently links a subject to an object. Although not articulated as such at the preliminary stages of the thesis, in retrospect we can anticipate the shadow of correlation determinacy looming. Frustrated by phenomenological reasoning, the articulation of a differentiated in-itself thus looked to events of *becoming,* the foundation of which can be positioned in various conceptions of quasi-objects taken as a form of ontological betweenness. In this too, we can see the origins of the doubling effect that ricochet around in various forms throughout the thesis – right up to the acceptance of its compactness in unreason, in fact. Correlationism aside, the digital as a differentiated in-itself then reaches a greater degree of resolve in the betweenness of da-sein, as bringing-forth of in-itself through the method of formal indication. Providing a means for practising the digital as an in-itself, formal indication points to the space of becoming without determinacy over what will become. Rather, literally, we might think about this as a pointing to the entropic potential of the computational *bit as* an entity differentiated but not determined, by virtue of its ability to assume one of two values. But formal indication could only ever provide a contingent solution. Bound to a priori assumption of there being a place, or *bit*, to point at, the spectre of reason could no longer be ignored. Thus, it became necessary to look to unreason in order to finally release the digital from the contingency of being an in-itself for-us. But critically here, it is important to assert that it is the *compactness* of the digital in-itself that ultimately defines it as being for-itself.

The Klein bottle nature of compactness is such that the something it contains is part of the nothing it is contained in. In effect, the Boolean differentiation between some-thing and no-thing is such that while they

remain discrete parts, they exist in inseparable continuity to each other. While we could perhaps articulate concepts of relational becoming in a similar Klein-like fashion, it is only compactness that bounces reason back at itself to release the in-itself from intent of human being.

The radical thing here is that it does this not by further isolating the in-itself from the world in order to differentiate it, but by realising that things are in the continuity of what they are not. It is in maintaining the difference between what the digital is and what it is not, that the digital is differentiated as an in-itself for-itself. Maintaining this difference is what we call practice – the event of a thing becoming digital in-itself.

[1] Dupont observes that the "hand" of the artist is not displaced by the digital. In fact, the artefact is a result of a series of physical processes, some of which are done on a computer and many others which are not (Dupont 2013). I suggest that these could be broken down to unequally weighted stages of transposition, manipulation, production and reproduction, some of which involve computational process, others of which involve traditional sculptural processes. The distinction between embodied and the disembodied digital process wilfully ignores the physicality of working on computers, as anyone who has suffered an RSI will attest.

[2] The exhibition titles "The New Materiality: Digital Dialogues at the Boundaries of Contemporary Craft", Milwaukee Art Museum (2011), and "The Future is Here", Design Museum London (2013), can also be taken as examples of this.

[3] Perhaps it is for this reason that The Museum of Applied Arts and Sciences dropped the prefix post in the more recent incarnation of *Out of Hand: Materialising the Digital*, Sydney (2016-17).

[4] Ontology is taken here in a Heideggarian sense of how not what.

[5] In assuming that

[6] The construct being used here makes reference to Goodman's logic statements and emphasises the connection between dialectic and counterfactual arguments. Although this connection has been made already in Appendix 8, it warrants some further clarification. As a term coined by Goodman, "the problem of counterfactuals is equally a problem of factual conditions" ("Problem of Counterfactual" 114). Thus both dialectics and counterfactuals are taken to stem from the axiom of the *excluded middle* that asserts that it is not "possible for the same thing to be and not be" (Aristotle, 211). This axiom is discussed further in Appendix 5 *"I'm the only one who got it right"*. A transcript of the text from this artwork is provided in Subappendix 1.

[7] It should be acknowledged here that Adorno's critique is focused on the *instrumentalisation* of reasoning rather than reason itself. While this is understandable in the context of Adorno's socio-political agenda, the relevance of dialectics for this thesis is the theoretical challenge it makes to reasoning. The issue of *sufficient reason* being a central concern of this Appendix.

[8] "The name of dialectics says no more, to begin with than objects go into their concepts without leaving a remainder, that they come to contradict the traditional norm of adequacy. Contradiction was not what Hegel's absolute idealism was bound to transfigure into […]. It indicates the untruth of identity, the fact that the concept does not exhaust the thing conceived." (Adorno, *The Jargon of Authenticity* 5)

[9] *Identity thinking* appears in Adorno's earlier work as the principle of immanence. I use *identity thinking* as it supports a more succinct account of the concept. It is also worth noting that non-*identity thinking* reflects Adorno's social and political stance more affectively than the earlier term.

[10] Although it is not possible or necessary to develop this argument here, *identity thinking and non-identity thinking* become useful ways of engaging with the methodological questions raised by this research. They help to connect several threads that have been running through this discussion and add weight to the position taken against *art-as-research* debates. In the dialectic sublimation of practice by research, *identity thinking* 'enframes', revealing nothing other than its own ability to subjectify. The current state of practice that must be resisted is that of not not-research in which the *work-of-art* goes unrecognised as either research or art. Similarly, Evens' computationally determined digital leaves out the not-not-computational of the digital/analog dialectic, and Kantian correlationism leaves relationality out of the subject/object dualisms.

[11] We can see here the relationship back to the function of negentropy in maintaining the vitality of a system. See 9.2.

[12] The *work-of-art* is defined earlier as the totality of the *what* and the *how* of *artwork,* artist and audience interactions. See 9.2.2.

[13] This distinction speaking back to the observations made regarding Material Thinking and techne. See 9.2.2.1.

[14] Or in Adorno's terms, anxious (*Aesthetic Theory* 353-4).

[15] Unreason is introduced here in anticipation of its introduction in section 10.3.

[16] If non-anthropocentrism is to be taken seriously, it would seem that there is indeed a need to learn from Floridi in this regard and consider an ethics beyond our own bio-centric self-interest. However, consideration of the ethical dimension of 'digital practice' sits outside the current concerns of this thesis.

[17] See 10.2.4.4.

[18] See 9.2.2.1.

[19] See section 9.2.

[20] See 8.8.

[21] Harman is again used as a counter foil in this chapter as he has a way of polarising issues that is helpful. This should not be taken as an affirmation of his position.
[22] See 8.3 and 8.5.
[23] This limitation was accepted in Appendix 9 as it enabled the principles of formal indication to be established such that this limitation could be addressed here.
[24] An infinite set of all sets.
[25] With regard to Harman it should be noted that he takes a similar approach although using different terms to describe the "highlights of this story" of causation ("Time, Space, Essence" 1).
[26] In Metaphysics, Aristotle sets out four types of cause: formal, material, efficient and final cause, using a bronze statue as an example (Aristotle, *Metaphysics* 36). Although comparison with Dupont's figures might be informative, it would be a distraction from the primary focus here. Of the *four causes* it is final cause – "the sake for which a thing is" – that concerns us here (Aristotle, *Metaphysics* 36).
[27] We will come back to the sixth approach later.
[28] Of course any such overview inevitably generalises, a relevant example here being Austin's treatment of Leibniz as a occasionalist. Taking occasionalism in the terms defined by Austin, as being a philosophy resting on the occasion of the divine activity, Leibniz certainly meets the criteria. This, however, rather ignores the problem of continual divine intervention which Leibniz rejected.
[29] Austin speaks more to Meillassoux's *strong form* of correlationism, which he also equates with idealism, which is perhaps a more useful term here in relation to subsequent discussions.
[30] In this sense it is concerned with the category of relata that was identified earlier.
[31] This is because of the central role Heidegger plays in Harman's body of work.
[32] This also has the useful effect of speaking back to points raised earlier with regard to practice in 9.2.2 and 9.2.3.
[33] Although Harman talks of tool-being as being equivalent to readiness-to-hand, it is meaningless unless taken to encompass the corresponding present-at-hand (*Tool-being* 4).
[34] Heidegger aligns this attitude with science and mathematics (*Being and Time* 413-415).
[35] The later is built on Husserlian phenomenology.
[36] It is easy to see here the reason why being brings-forth as discussed in 9.2.2 and how it relates to Goodman's *show forth in* 8.9.
[37] Although the four causes are expressed as *causa materialis*, *causa formalis, causa finalis and causa efficiens* in *The Question Concerning Technology,* they are identified as the fourfold which is cited here from *Building Dwelling Thinking.*
[38] Heidegger uses *causa efficiens* (*Question Concerning Technology* 6).
[39] The reading here is largely taken from *The Question Concerning Technology*. Although the concept is articulated in different terms in the later *Building Dwelling Thinking,* it remains consistent with the earlier explanation (Heidegger, *Poetry, Language, Thought* 145-161).
[40] As Harman correctly recognises, this *fourfold* is indebted to Aristotelean and phenomenologist traditions that are essentially concerned with the causal relations between: The fourfold world of gods, earth, sky and the phenomenological appearance of entities. While acknowledging the significance of Aristotle's theory of substance and causation (see footnote above), he places greater emphasis on the phenomenological tradition of Husserl and Leibniz from whom he derives the real and sensual objects that are used in *vicarious causation* (Harman, *Quadruple Object*).
[41] Heidegger refers to this as *enframing:* "Enframing means the gathering together of that setting-upon which sets upon man, i.e., challenges him forth, to reveal the real, in the mode of ordering, as standing-reserve" (Heidegger, *Question Concerning Technology* 20).
[42] Although Harman would argue that his quadruple object is nonetheless an object in the world as its sensual qualities only come into existence in relation to other objects, his quadruple object construct never the less interior structure. I am of course intending to make reference here to the infinite recursion of the set of all sets.
[43] Harman takes Essence, Space, Eidos and Time as the new causal tension. For a diagram of this see *The Quadruple Object,* Figure 8. The Four Tension (Harman, 114).
[44] Harman further justified this on the grounds of asymmetric contact that allows for an imbalance of causal involvement (*Quadruple Object* 75).
[45] For clarity's sake these have not been discussed here but they are time, space, essence and eidos (Harman, "Time, Space, Essence" 17).
[46] Harman identifies this "intentional agent" as the sensual object (*Bells and Whistles*).
[47] Speculative Realism, as defined by Rick Elmore in the *Meillassoux Dictionary*, "is a broad term encompassing an array of philosophical positions all of which share a general resistance to what Quentin Meillassoux calls correlationism, the beleif that the human world correlate forms the central element of philosophical investigation" (In Gratton and Ennis, 159).

[48] Speculative Realism was the name of a one-day workshop held at Goldsmiths, University of London on 27 April, 2007. The workshop included presentations by Ray Brassier, Ian Hamilton Grant, Graham Harman and Quentin Meillassoux. The proceedings were subsequently published by Collapse, Urbanomics independent journal of philosophical research and development (Brassier et al.)

[49] It also encompasses other associated positions such as Ray Bassier's 'nihilism', and Iain Hamilton Grant's 'idealism', although these are not addressed directly here.

[50] Rosi Braidotti and Manuel Delanda introduced the term 'neo-materialism', while Jane Bennett uses the term 'vital materialism' to assert 'thing power' of objects, and Karan Barad uses 'agential realism' to address the intra-action of agentic beings.

[51] In the opening chapter of the *Speculative Turn: Continental Materialism and Realism,* Bryant et al note the difficulty of defining a term to encompass both realist and materialist arguments (2011). Although they formally propose 'the speculative turn', this is largely to serve as a counterpoint to the 'linguistic turn'. The use here of 'speculative ontology' is an attempt to distance the argument from such counterfactual positions and speak directly to the potential of the speculative as subsequently developed.

[52] See Whitehead in section 10.3.1.

[53] Naive here is used with reference to Meillassoux's discussion of the correlational circle: "The circle means that there is a vicious circle in any naïve realism, a performative contradiction through which you refute what you say or think by your very act of saying it or thinking it" (Meillassoux, *Time Without Becoming* 1).

[54] *Symbiosity of Creation* is also the title of Flamingo's (aka Jarosław Czarnecki) doctoral dissertation that he completed at the Academy of Fine Arts in Gdańsk where he is currently Deputy Dean of the Faculty of Sculpture and Intermedia Arts. The artwork reportedly received "received wide coverage in the country of Poland and abroad", and was awarded Critics and Editors of Art Magazines Award at WRO Media Art Biennale in 2015 (Czarnecki).

[55] This is an extension of Cole's statement that: "Given that not every object is a human, though every human is an object, you can't have an object-oriented ontology if humans are at the centre of it" (Cole 320).

[56] DeLanda's definition of flat-ontology has a totally different meaning from that initially conceived of by Roy Bhaskar in the 1970s (*Realist Theory*). Where Bhaskar's purpose was to articulate a "flat undifferentiated ontology of empirical realism", the contemporary meaning of it as interpreted by Harman from DeLanda is to "A world in which all levels are on the same playing field" (Bhaskar 253; Harman, "Road to Objects" 177). In this sense speculative realisms use of the term needs to be understood as a rejection of Bhaskar's human centred commitment.

[57] See sections 8.5.1 and 9.1.5.

[58] "*The principle of sufficient reason*, according to which for every thing, every fact, and every occurrence, there must be a reason why it is thus…" (Meillassoux, *After Finitude* 56).

[59] By way of pointing to the emergent nature of the speculative ontologies, we should note that Meillassoux's preferred term is 'Speculative Materialism' which speaks to both 'Speculative Realism' and 'New Materialism'.

[60] See for example Harman's *Quentin Meillassoux. Philosophy in the Making*.

[61] Although admittedly that is difficult because his treatment of facticity is central to his argument. See 9.2.1.2.

[62] 'Against' is bracketed out here because as will be discussed, Meillassoux doesn't actually abandon correlationism.

[63] Although it might seem more appropriate to say post-Kantian continental philosophy, in the English translation Meillassoux refers to modern philosophy, so I have retained his term.

[64] Although Meillassoux never makes this connection, it also parallels the Hermeneutic circle in some senses.

[65] 'Strong correlationism', technically speaking, has two stages. It is the second more problematic one that is addressed here.

[66] See section 9.2.1.2.

[67] See discussion of the Undecidability Problem in 8.7.2.

[68] In fact, Harman refers to Meillassoux as a *hyper-occasionalist* on the basis of hyper-chaos (Harman, "Quentin Meillassoux: A New French Philosopher" 115). See also Harman's treatment of occasionalism in *On the Undermining of Objects: Grant, Bruno, and Radical Philosophy*.

[69] Meillassoux points out that Heidegger acknowledges the difficulty of conceiving of "what nature would be without man – must it not resonate through him [hindurchschwingen] in order to attain its own most potency?" (Meillassoux, *After Finitude* 198).

[70] See 9.2. Both Lambert Stepanich and Mark Tanzer address tension inherent in Heidegger and position him between realism and idealism (Stepanich & Tanzer).

[71] The question of becoming gets somewhat clouded in *After Infinitude* because it is also linked to the question of scientific representation and things becoming for a reason. However, there is no inconsistency between the two texts.

[72] A connection back to Adorno should be evident here in that something has been forgotten in the dialectic of indication: The contingency of not-not-reason.
[73] Ex nihilo.
[74] Again for purposes of clarity I have avoided introducing Meilllassoux's term *hyper-chaos* which Sutherland usefully summarises as "a time not of perpetual becoming, but of lawless creation and destruction, premised upon an abandonment of the principle of sufficient reason" (161).
[75] Although obviously relevant here, Meillassoux's concept of the arche-fossil is left for subsequent discussion as noted earlier.
[76] See 8.7.2
[77] This point is significant as it establishes the agency of non-human objects and is central to formulating the position in 10.3.3.
[78] See 8.3.1.
[79] See 8.3.1.
[80] In this regard, Harman's brief account of Meillassoux's critique of Goodman is made in a very limited context and does not represent Meillassoux's position fully (Harman, *Quentin Meillassoux* 57).
[81] *Transfinite* is a term coined by Gregor Cantor for the purpose of comparing two infinite sets. "The transfinite numbers are in a sense new irrationalities, and indeed in my eyes the best method of defining finite irrational numbers is the same in principle as my method of introducing transfinite numbers" (Cantor, 77).
[82] It is, however, worth mentioning that the tape in a Turing 'computing machine' appears to operate under this transfinite logic. See 8.2.2.
[83] Indeed, this approach is mirrored by this text in which the correlational argument for formal indication was set out so that the contingency of its facticity could be understood.
[84] See pages 196-197.
[85] Which is especially relevant given the preceding discussion of the problem of induction.
[86] "Rather than being contingent, as Meillassoux promises, things are tied to necessary laws now as much as ever, but simply to laws whose character might change suddenly for no reason" (Harman, *Quentin Meillassoux: Philosophy in the Making* 40).
[87] More specifically, not only do I constrain the discussion to the question of duality within Garcia's work but further limit my analysis to Book 1 of *Form and Object: A Treatise on Thing*s that is concerned with Form, rather than Book 2 which is concerned with Object. Pages 19-74 are especifically relevant.
[88] There is of course additional resonance here too. As a student and follower of Meillassoux, Garcia's 2010 *Form and Object* should be seen in relation to Meillassoux's work despite there being little direct acknowledgement of this. *Form and Object* only makes one reference to time and contingency, however in an interview for *Figure/Ground* Garcia acknowledges Meillassoux's influence (L. Jones, "Interview with Tristan Garcia"). But perhaps more to the point here is Garcia's non-fiction work which is taken as a grounding of his philosophical writing within the *matter* of practice.
[89] Although Garcia acknowledges that his work stems from analytic and dialectical training that leaves no room for non-identified entity thinking, his conception of 'compactness' is taken as evading dialectic exclusivity ("Crossing Ways").
[90] This is also unpacked as "nothing is the negative form of something without this something. Nothing is therefore not the opposite of something, but rather the opposite of something added to the absence of this something. Nothing is the addition of the opposite and absence of something" (Garcia, *Form and Object* 46). Although out of context the compounding nature of this statement is easy to misread.
[91] The Klein bottle, like a Möbius strip, is mathematical construct of a non-orientable surface meaning that it does not have surface which can consistently be defined in space. Rather its continuous surface forms both an interior or exterior plane.
[92] Etymologically, zero is a "'figure which stands for naught in the Arabic notation,' also 'the absence of all quantity considered as quantity'" (Trumble "zero").
[93] If it was also true for something we don't know, then it would not be true to us unless we knew that 'something else' ourselves, in which case it would then also be true for us.
[94] I would be cautious about extending this to computational processes such as Digital Signal Processing, however, as this conversion process results in an autonomous other that is in Floridi's terms a level of abstraction.
[95] A fuller understanding of Garcia's 'compactness' relies on his notion of de-determination. De-determination is mentioned briefly in both *Form and Object,* and *Crossing Ways of Thinking*. While it is not fully developed there as a central concept, it is given greater emphasis in the more recent paper *What is Something* (Garcia, *Form and Object* 5; "Crossing Ways", 20; "What is Something", 47-50). To maintain the focus of the argument, de-determination is not introduced into the argument but should be read as inherent in references to 'compactness'.

[96] The relational positioning of in-itself by 'compactness' is what avoids dialectic critique, as it is 'difference' or non-identity defined by the dialectics of thing and not-thing that is an in-itself.
[97] "No-matter-what's only determination is that it lacks all determination" (Coburn and Ohm in Garcia, *Form and Object* xvi). "Contingency, and only contingency, is absolutely necessary" (Meillassoux, *Time without Becoming* 9).
[98] See Burnham on negentropy in 10.2.3.
[99] See 8.5.2.
[100] Meillassoux makes an overt reference to the *may-be* in *Time Without Becoming*: "That's why I think that ultimately the matter of philosophy is not being or becoming, representation or reality, but a very special possibility, which is not a formal possible, but a real and dense possible, which I call the "peut-être"- the 'may-be'. In French, I would say: L'affaire de la philosophie n'est pas l'être, mais le peut-être. [Philosophy's concern is not with being but with the May-be.] This even [? "This mere Peut-être" or "Even this Peut-être"?] Peut-être, I believe, but it would be too complex to demonstrate this here, is very close to the final Peut-être of Mallarmé's Un Coup de dés" (Meillassoux, *Time Without Becoming* 27). The reference here is to the Stéphane Mallarmé's *The Throw of the Dice Never Will Abolish Chance*, a poem which itself is the subject of Meillisoux's analysis in *The Number and the Siren A Decipherment of Mallarmé's Coup de Des.* Subsequent references made here to throwing the dice are taken in the context of this reference.
[101] See 10.2.1.
[102] Discussed briefly in 8.6.1
[103] While Garcia's reading of the Growing Block Universe theory is based in C. D. Broad, he seems more closely connected to J. M. E McTaggart's qualitative conception of "futurity, presentness and pastness" (McTaggart). The Growing Block Universe is a third alternative to presentism and eternalism. Garcia acknowledges Bergson's influence on McTaggart but does not develop the discussion of time in relationship to duration (Garcia, *Form and Object* 180).
[104] See Garcia, "Crossing Ways" 15.
[105] The use of attack here intended to reflect Harman's general tone as reflected in the use of words such as "destroyed" and "defence", but also in direct reference to his 2010 paper; *I am also of the opinion that materialism must be destroyed*.
[106] Quite unnecessarily Harman gets entangled in lengthy analysis of formalism simply as a counter position to his own. To some extent the platform for consideration of form has been established in 8.7.1 Substance.
[107] As Bryant points out this distinction is "exacerbated by the gendered nature of the two streams of thought, SR [Speculative Realism] being very much a boys club" ("Speculative Realism"). The relationally of New Materialism can then be aligned with political 'otherness' "which refuses the linguistic paradigm, stressing instead the concrete yet complex materiality of bodies immersed in social relations of power" (21). The political dimension inherent in New Materialist philosophies thus marks another point of distinction against the apolitical attitude associated with Speculative Realism as identified by Alberto Toscano in his critique of Meillassoux ("Against Speculation").
[108] This reference to the title of Harman's 2010 paper, "I am also of the opinion that materialism must be destroyed".
[109] Harman also initiates Bergson, William James, Serres, Gilbert Simondon, Gabriel Tarde, Etienne Souriau into this hooligan club.
[110] Unique or un-surpassable individual: In a class of his own.
[111] The cited comments are made in a book on Latour [which?].
[112] Parodying Harman, Bennett wryly comments: "This is I think what those passé philosophers Deleuze and Guattari do in *A Thousand Plateaus*" (Bennett, "Systems and Things" 227).
[113] I also note that the socio-political allegiances of New Materialism are more sympathetic to Deleuzain interpretation that the more formal approaches of object orient philosophies.
[114] The distinction made here is articulated by Evens in regard to the incompatibility of two ontologies: One derived from the Deleuzian notion of the the 'virtual', "where the virtual is creative and fecund, and the digital is sterile and hermetic", the other from Evens' own ontology in which the digital is creative by virtue of a *fold* – a 'wrinkle' in the surface of the digital that occurs "anywhere the digital meets the human" ("Digital Ontology and Example" 147; 158). The paradox between these two ontologies that Evens suggests is the "political and aesthetic problem of the digital", is taken here to inform the divisions being articulated between Speculative Realism and New Materialism ("Digital Ontology and Example" 147).
[115] Laura Marks' analysis of Mona Hatoum's, *Measures of Distance* (1988), in *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses,* as well as Vivian Sobchack's *Carnal Thoughts* informed related issues of embodiment in the initial stages of this research. As significant as they are these are considered beyond the scope of this current project.
[116] In *The Quadruple Object* Harman replaces "note" which is originally used in *Guerrilla Metaphysics* with "specific qualities". The later is used here but cited as pertaining to the original reference as the context of this earlier text is more relevant.

[117] The test by which being is without the contingency of becoming.
[118] Garcia speaks to the manner in which the twofold of the dialectical tradition is clearly expressed in the existence of this "formal" system" ("Crossing Ways" 19).
[119] See 9.2.4.4.
[120] It is perhaps this relational primacy that makes New Materialism resonate with Carter and Bolt's *Material Thinking.* See 9.2.2.1.
[121] See 9.2.2.1.
[122] As sited earlier in section 10.2.3: "The weakest something that we can conceive of is alone, deprived of itself, exiled outside itself and inside something other than itself, inside the world: it is so weak that anything can be it" (Garcia, "What is Something?" 51).
[123] The facticity of un-reason, as described by Sutherland in Section 10.2.1.: "the principle of "un-reason": absolute contingency - and thus the absolute absence of sufficient reason" (Sutherland, "The Law of Becoming" 162).
[124] See 10.2.4, but also 8.6.2, with regard to Latour's *parliament of things*.
[125] See 9.2.2.
[126] See 8.8.
[127] See 8.8.
[128] In doing this I make inferences back to previous discussions, particularly those in 8.8 and 10.3.2. However, as this identifies key concepts it will have multiple resonances throughout this thesis.
[129] See 8.7.2.
[130] See 8.8.
[131] This was the assumption accepted in Appendix 9.
[132] See 9.2.1.
[133] Although this will not be developed here, the suggestion is that philosophy is limited by its reluctance to practise τέχνη. See 9.2.2.1.
[134] To again use Meillassoux's metaphor of the throw of the dice: While who goes first can be determined by the roll of the dice, someone still has to roll them.
[135] Meillassoux uses "*performative* contradiction" as a way of describing the correlational act of saying and thinking (Meillassoux, *Time without Becoming* 10). My emphasis here on performative stresses the fact that reason is not just thought but a practice also.
[136] As Harman notes in his account of the first Speculative Realism workshop, 2007, there was some disagreement among the founding group, with Meillassoux arguing for Speculative Materialism. Harman also goes on to note, he is "the only original Speculative Realist who still wholeheartedly endorses the term" ("The Road to Objects" 79).
[137] I note here slight differences in the terminology used in various texts. Factuality is a term used in the 2007 lecture at the Speculative Realism workshop, whereas factiality is used in the 2008 translation of *After Infinitude.* Although adding complexity to an already confusing set of terms, these differences make no substantive difference to Meillassoux's argument.
[138] As quoted in the previous section "that one can reason about the absence of reason" (Meillassoux, *Time Without Becoming* 29).
[139] Although we will not be developing all aspects of it, Whitehead provides a succinct definition: "Speculative Philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted" (Whitehead, *Process and Reality* 4).
[140] See 8.4.
[141] Whitehead positions Speculative Philosophy as a metaphysical method "which seeks to discover the general ideas which are indispensably relevant to the analysis of everything that happens" (*Process and Reality* 84). This concern with what *happens* therefore aligns with the question how things happen and thus with the question of *necessary reason,* although Whitehead does not explicitly frame it as such.
[142] 'Actual' here refers to "the final real things the world is made up" of (Whitehead, *Process and Reality* 27). While Whitehead's general understanding of 'actual entities' is consistent with practices of becoming, discussed in Appendix 9, his insistence that they are divisible in an "indefinite number of ways" resorts to class construction that are the reason for his earlier exclusion (*Process and Reality* 19).
[143] Formal is to be read here in terms of being a logic method as it was within Goodman's mereology, and not in a Heideggerian sense as a commitment to *Beyng* (See 8.3 and 9.2.1.1).
[144] See 9.2.1.1.
[145] See 9.2.1.2.
[146] In returning to the first part of the structure of analysis used in Appendix 9, I am not precluding the possibility of examining the other two modes of practice identified; the work of the audience and the work of art, but constraining the argument in order to test its principle.
[147] As defined earlier, as the methods used by the artist in producing the *artwork*.
[148] With reference to Paul Carter's *Material Thinking* in 9.2.2.1.
[149] See 9.2.

[150] The emphasis on *part* here is to signal that the speculative is paired with indication and that only these two together constitute a negentropic system. This will be clarified shortly.
[151] See 9.2.4.
[152] With reference to Garcia's conception of time as varying intensities of presence.
[153] Based on the 1984 circulation of 248,382, in Peter Franks, *Print Politics: A History of Trade Unions in the New Zealand Printing Industry, 1865-1995* (254).
[154] In the use of 'today' we are reminded of Goodman and Quine's nominology and the rejection of X as an entity in itself. See 8.3.1. Today is thus not a day in itself.
[155] The New Zealand Herald changed it format from broadsheet to tabloid on September 7, 2012.
[156] In less specific terms, this argument with regard to the agency of the material was foregrounded in 9.2.2.2.
[157] See 9.2.2.1.
[158] Following Meillassoux, reason has no access to unreason.
[159] Although Garcia illustrates this with a diagram this is not provided here in order to maintain consistency with the approach taken regarding the indicative integrity of the text.
[160] Unlike the predictable mechanics of a clock however their alignment is determined by a roll of the Meillassouxian die.
[161] This would seem to be especially true of an academic practice as we see reflected in Latour's criticism of Serres's encyclopaedic knowledge. Serres however, embraces the encyclopaedic method for as central to philosophy (Serres, *Conversation on Science* 126).
[162] The practical methods used by the audience in engaging the *artwork*.
[163] See 9.2.3.
[164] The global *how* of art practised.
[165] As touched on briefly in 8.5.2, Verwoert critiques the dialectic imperative of 'getting it' as a crisis of legitimacy that denies the potency of the work becoming. In seeking "a way to perform without any mandate or legitimation", and "asking where to start and where to end", Verwoert positions practice in the uncertain space of becoming, or, as he calls it, the *I Can't. (Exhaustion and Exuberance 94 & 95)*.
[166] The digital is again trapped in the correlational circle as if being held at arm's length by Doherty's objectifying Eye. See 9.2.5.
[167] See 9.2.4 regarding enframing and situated vision, but also 9.2.5 regarding situated knowledge. These concerns are reflected in the text's strategies and structure that, within the confines of this thesis, tries to mitigate against intent by not revealing in advance what is to be found.
[168] See 9.2.5 regarding Haraway's reading of O'Doherty.
[169] Ontologies having the doubling affect found in Meillassoux's un-reason and Garcia's compactness.
[170] See 10.2.4.
[171] As per Bennett's critique in 10.2.4.

Subappendix 1

"I'm the only one who got it right"

This appendix is a transcription of the text from Appendix 5 *In Receipt of (*"I'm the only one who got it right"), exhibited at The Exhibition Research Lab, Liverpool John Moores University, 13 - 24 March 2017. Due to the 'print on demand' format the text assumed in the exhibition, it is provided here in an extended format.

In season three of the television series *Homeland* the bi-polar heroine, CIA agent Carrie Matheson, confronts a reporter with her version of the "truth" and forcibly asserts that she is "the only one who got it right" (Homeland, 2013). Slightly manic from "skipping her meds", the rather implausible character embodies the divisive nature of legitimate claims – albeit in the context of a TV show centered on Middle Eastern politics. But my point here is not to bring USA foreign policy or covert operations into my argument, nor is it to critique the TV series as a digital media production. Rather, the series serves to highlight the many levels at which the problematics of dualist thinking are imbedded in cultures of legitimacy where "getting it right" is the dominating rational.

Carrie Matheson's passionate assertion that she is the one – *the one* – above all others who has got it *right,* is then indicative of the point made by Isaac Tylim in his psychoanalytic reading of the television series, that the series is a "choreography of internal and external reality (that is the question of what constitutes truth)". While much of Tylim's analysis of memory and trauma is of little relevance here, his key point that throughout the series the absoluteness of getting it right is called into question, is worth unpacking. For Tylim, then, the television series is a critique of the dualisms that reside in both the temporal narratives of the real and the reel, as much as they do in the characters' precarious grip on the "absolute rhetoric of 'us versus them'"(Tylim, 197). The very title *Homeland* is, Tylim proposes, a substitute "for a space capable of containing the unspeakable" (2014, 196). Thus, while the plot is driven by "god-guy/bad-guy" narratives that seem to perpetuate cultural stereotypes, there is in fact a far deeper reading that is less polarising than the lead character Carrie Matheson herself. In fact, it is clear that Matheson's medical condition is itself a questioning of binary assumptions in which subjectivity is seen as a constant. Rather than being either manic or depressive, then, subjectivity is presented as having a gradient in which the singularity of the declaration "I'm the only one who got it right" is brought into question.

The Homeland dilemma.

One of the consistent themes identified by Tylim in his analysis of *Homeland* is that of the translator, which he claims works on many levels to signify the "link between the familiar and the unfamiliar" (198). Between the dualitie of the known the unknown, is played out as a series of interchangeable subject and object representations that obliterate boundaries. It is, according to Tylim, through this interplay between subject and object that a "choreography of internal and external reality" emerges to question constructs of truth, and to problematise the notion of being in an indigenous state (197). While a homeland is on the one hand a discrete and stable domain, it is also seen as a fluid and intersubjective truth in which opposing subject and object dualisms can no longer assert sovereign claims. A homeland is in this sense a paradoxical construct in that, while it maintains the autonomy of its borders, what is contained within those borders is constantly subject to change.

As a quasi-stable entity, a homeland presents both an opportunity and a dilemma for the translator who, like the Hermes of Michel Serres' quasi-object, finds himself abandoned mid-flight. The translator is necessary because the discreteness of things renders them separate from other things, but is at risk of annulment because of the temporality of discreteness. Destined to circle endlessly, the Hermes may never land, not because the borders are closed but because things are constantly forming and reforming themselves as other states. Thus the dilemma presented by the notion of the homeland is that translation between subject and object becomes ineffectual. It is not that there are no longer such things as discrete objects, but that those objects constantly change their language – ontologically re-forming themselves, so that the translator is rendered mute.

It is perhaps better to hyphenate the term in order to emphasise the gap

between home and land, following Heidegger's use of the hyphen in Da-sein, that is the thing-in-itself. A home-land is found neither in the concept of home nor the location of place – neither in the subject nor the object. Da-sein – being-there – like *Home-land* is a self-presencing event articulated by a translator.[1] Such translators are those that practise the act of making knowledge present. In the same way that Heidegger's Da-sein asserts an ontological shift from a *what* to a *how,* translation is an event of knowledge production as practice.

A home-land is then both a thing in the Kantian sense, and a *being* in the Heideggerian sense. Yet in terms of Matheson's claim of "being the one who got it right" – the one who knows the truth – knowledge is framed as transcendental in that it requires a translator who sits outside the sovereign state of being and is able to provide a non-correlational a priori *ontological proof*. The *Home-land* dilemma is thus the dilemma of the necessity of providing an "ontological argument" in which the burden of proof dictates a transcendent being, the existence of which itself requires transcendental proof.

In light of the *Home-land* dilemma, the aim of this section is to explore the claim that the digital makes to "getting it right" and to problematise this claim as a failing of legitimacy, in the sense that it constitutes a statement of transcendence. As an infallible legitimacy, the digital makes a claim to always "getting it right" by claiming absolute integrity without transcendence. Yet it seems that it is only through transcendence that this claim can be asserted. The definition of the digital as a discrete absolute is then problematised from both subject and object perspectives as being un-tenable given our current understanding of it. The digital thus operates as a theistic *reductio ad absurdum* – an argument that breaks the principle of non-contradiction. The irony of undertaking an inquiry regarding digital ontology is thus accepted to the extent that the critique of the digital is itself presented as an insular critique which methodologically problematises the

argument made. To argue for something that is discrete is to argue for an a priori position that is independent of experience. Yet to make this claim I must transcend the subject, an act which inherently challenges the absolute legitimacy of the argument made. However, rather than seeing this critique of absolute legitimacy as a failing of my argument, the *reductio ad absurdum* of the argument is turned back on itself to problematise the frameworks of knowledge that mandate such claims – in this case the requisite claim to knowledge made by PhD research. It is from this critical perspective that the methodological approaches taken in this research begin to emerge.

Reductio ad absurdum

As the "one who got it right", it follows – using the *principle of the excluded middle* – that Carrie Matheson is the one who did not get it wrong. As a claim to knowledge about Matheson, this statement rests on the axiom of the *excluded middle* that asserts that it is not "possible for the same thing to be and not be" (Aristotle, 211). The *law of the excluded middle* (A is either == A or != A)along with the *law of identity (A == A) and* the *law of non-contradiction* (A != ~A) developed in pre-Socratic western philosophy, and still underpins many modern claims to knowledge by eliminating vagueness, ambiguity and contradiction (Danaher).[1]

> Law of identity: An object is the same as itself.
>
> Law of non-contradiction: "The same attribute cannot at the same time belong and not belong to the same subject and in the same respect" (Aristotle, 208).
>
> Law of the excluded middle: "Nor will not be possible for the same thing to be and not to be," (Aristotle, 211).

Thus we might frame Matheson's declaration – "I am right" – as being axiomatically "right" ("Whatever is, is"), while also stating "I am not wrong" ("Nothing can be and not be") and as a statement that things are either "right" or "wrong" ("Everything must either be or not be") (Russell, 68). As *self-evident* principles, these axioms are taken for granted in the formation of analytical knowledge" a largely scientific concept of knowledge" that, as Michael Biggs argues, has until recently dominated academic research (2011, 2). A PhD's claim to new knowledge is then typically evaluated against this framework – and is taken as proven if it conforms i.e. if the knowledge claims made are specific and non-contradictory.[2] Like Matheson, the successful PhD thesis must logically prove that it is "the only one who got it right", where "right" is taken as also being "new".

It is, then, this Aristotelian logic that James Lewis, drawing on Nelson Goodman, uses to define the digital when he writes that for "any two marks that are not copies, no matter how nearly indistinguishable they are, there could be a mark intermediate between them which is a copy of neither…" (Lewis, 321). Lewis' statement then conforms to the principles of analytical logic in that it maintains the discreteness of each mark without ambiguity or contradiction. In fact, this comparison serves in part to explain why computational digital processes have become synonymous with fact. The discrete is thus the unfailing affirmation of the laws of thought. It always "gets it right". Each Boolean unit returns the ultimate affirmation of reasoning. By being what it is and never what it is not, it provides *sufficient reason*[3] for being.

Law of identity: 1 == 1

Law of non-contradiction: 1 != 0

Law of the excluded middle: Either <1, 0>.

Providing *sufficient reason,* as explained by Christian Wolff, means simply that "nothing is without reason" (as cited in Melamed), "reason" here

being taken as complying with the laws of thought. The digital thus provides *sufficient reasoning* by ensuring that without contradiction the pure identity of each byte of data can never be compromised even when corrupted. 01001001[4] will always equal 01001001,or it will not. Similarly each individual bit can never be contradicted by saying that one is in fact zero as each bit is either a one or a zero, never both,[5] and certainly never 0.5 or some measure between. The digital is the "one that *always* gets it right".

01100011 01100001 01110100 01100011 01101000 00101111 01100010
01101111 01110101 01101110 01100011 01100101
01100011 01100001 01110100 01100011 01101000 00101111 01100010
01101111 01110101 01101110 01100011 01100101
01100011 01100001 01110100 01100011 01101000 00101111 01100010
01101111 01110101 01101110 01100011 01100101

As an exemplar of *sufficient reasoning,* the digital reflects a mechanical view of the universe in which things, like bytes, operate as composites of parts that are compatible with analytical thought that "break things down into ever smaller parts until all contradictions disappear and the laws of thought prevail" (Danaher). In this way, Danaher argues, when searching for the true ontological being of a thing we tend to dismiss the subjective appearance of things and drill down to the smallest mechanistic unit that complies with the law of thought. Indeed, we are reminded by Danaher that "subjectivity certainly undermines the law of thought" (Danaher). Lewis' definition of digital and analogue representation, then, is consistent with this mechanistic approach as it attempts though unambiguous, non-contradictory statements to reduce abstract concepts to a mathematical equation with absolute value ascribed to its primary elements.[6] Thus Lewis' research is considered valid because it creates objects of thought through abstraction in way that is consistent with the laws of thought.

The laws of thought create an absolute "homeland" that manages the bi-polar tendencies of things by insisting that they can only ever be one thing or the other, never both at the same time. While we have drilled down to identify the logic that supports the assertion of absolute claims such as that made by Matheson, it is now necessary to question the veracity of that logic itself: to determine whether logic, as a method for defining absolutes, successfully makes claims to truth that can be upheld. Is logic itself a *sufficient reason* for asserting absolute truths?

As a function of cause and effect logic, the principle of *sufficient reason* operates as a self-evident axiom stemming from the Cartesian principles inherent in the *laws of thought,* where reason is premised on the existence of a primary absolute that "establishes the existence of an absolute[7] – a perfect God" (Meillassoux, 2008, 51). More specifically, following Rene Descartes, because of this perfection "it is impossible that God should ever deceive" us (Descartes, 1996, 37). Thus, Descartes establishes the *ontological proof* of God on the basis of his perfection – a perfection that prevents him from deceiving us about his existence![8] In other words, the very nature of God ontologically ensures his existence. God is put beyond logical thought but is taken as true, nevertheless. Descartes thus establishes the existence of God as an absolute a priori truth upon which "all knowledge depends uniquely on my awareness of the true God" (1996, 49). It is on this basis that the laws of thought and the principle of sufficient reason are established. That is, if we logically pursue an ontological argument we will eventually be confronted with an absolute value (be it God, or a 1, or a 0) that we must accept as a priori to logic itself. This comparison is made by Descartes himself when he declares that we should "regard the existence of God as having at least the same level of certainty as [I] hitherto attributed to the truths of mathematics" (1996, 45). We are thus provided with surety regarding the absolute facticity of mathematics on the same basis as God: "(T)he most certain truths of all were the kind that I recognised clearly in connection

with shapes, or numbers or other items relating to arithmetic or geometry, or in general to pure and abstract mathematics" (Descartes, 1996, 45).

The problem with claiming absolute truths as a consequence of sufficient reason is that unless we accept an a priori knowledge, there is insufficient logic to assert any claim to knowledge. To put it another way – all claims to knowledge that are premised on the laws of logic contradict the premise of their own logic. Logic itself is shown as a *sufficient reason* for claims to knowledge only if we accept the existence of an absolute that transcends the logic of argument. Thus any research that makes a claim to new knowledge and is methodologically based on the laws of thought, implicitly accepts some form of a priori knowledge that sits outside of what is able to be thought.[9] Such claims, then, are bound up in a hermeneutically circular argument that fails to meet its own criteria of eliminating vagueness, ambiguity and contradiction. Thus we can assert that logic itself provides insufficient reason for making claims to knowledge.

Of course the irony of this statement does not escape me. By the logic of the argument that I am asserting, I am calling into question the validity of my own argument and implicitly undermining the methodological validity of my own research! But what other way is there to counter the stranglehold that sufficient reason has over the explication of knowledge?

Universe of discourse.

In the previous section reference was made to the comparison Descartes makes between God and mathematics – a comparison that positions both as absolute facticities resulting from the *laws of thought*. I have no wish to engage with religious narratives arising from this comparison; rather, my critique of this reasoning is intent on exposing the

tautological premise of analytical logic that ultimately relies on a priori arguments in order to validate its attestation of truth.

There are two points arising from this that need further clarification. Firstly, the already implied relationship between logic and the assertion of academic research; and secondly, is the methodological limitations of analytical logic when it comes to dealing with digital ontologies. I will address the specifics of this first before returning to discuss the broader concerns about the methodological function of logic in the validation of academic research. In doing this the motivations for the methodological approach taken in this research will start to become apparent.

The extent to which mathematical logic and, by extension, the sciences in general[10] are inextricably connected to the laws of thought is explicitly stated in the title of George Boole's *The Laws of Thought, On Which Are Founded the Mathematical Theories of Logic and Probabilities* (1854). As well as acknowledging Leibnitz's principle of contradiction as holding a fundamental place in mathematics, Boole also speaks directly to the derivation of mathematical syllogisms from the laws of thought (185). Thus it is that Boole provides an expression for the *laws of thought* as $x^2 = x$, that he then extends to propose the basis of a formal algebraic language that subsequently develops into Boolean Algebra.[11] Thus Boolean statements of the laws of thought equate to:

Law of identity: An object is the same as itself: $(A \equiv A)$.

Law of non-contradiction: $\neg(P \wedge \neg P)$.

Law of the excluded middle: $(P \vee \neg P)$.[12]

For the purposes of this research it is unnecessary to provide a more detailed comparison than this between Boole's expressions and the *laws of thought,* especially as this topic has been comprehensively covered by others, including John Corcoran in his paper *Aristotle's Prior Analytics*

and Boole's Laws of Thought (2003). My point is to establish grounds for making the claim that Boolean logic[13] developed directly from philosophical reasoning which, as Boole points out, performs an important function in asserting academic claims of knowledge(174). As Corcoran states, "Boole (1854, p.241) explicitly accepted Aristotle's logic as "a collection of scientific truths" (2003, 264) and sought to associate logic with mathematics rather than philosophy (Corcoran, 2003, 270). Although it is important to note that where Boole's philosophical predecessors were intent on the epistemic implications of logic, Boole's work marks a shift to the ontological function of logic that "is concerned with the real world…. though with its more abstract and general features" (Russell,1919, 169). Thus it is that mathematical "truth" and philosophical "truth" are often taken as correlates in academic thinking.

Boole thus establishes the framework – on the basis of which Lewis later makes his mathematical definition of the digital – that subsequently supports what we know as Boolean logic: the distinction between 0 and 1, True and False[14]. However, Boole's use of the symbols 0 and 1 holds more significance here than simply articulating numeric logic. On the one hand, Boole allows for the symbol 1 to stand for any *class* of being, and on the other allows for the symbol 0 to represent Nothing. As Boole explains, "1 must be 'the Universe,' since this is the only class in which are found *all the* individuals that exist in *any* class. Hence the respective interpretations of the symbols 0 and 1 in the system of Logic are *Nothing* and *Universe"(1854, 34).*[15]

Of particular significance here is Boole's paradoxical definition of the *universe of discourse* as the terms of reference for logic (Boole, 30), under which 1 can be both universal and localised; it can universally apply to any class, but is also discrete within the terms specified by a class within which it is universally applicable. Paradoxically, 1 has the potential to be any one, but only one, and not many ones at the same time. As Corcoran points out, this is remarkably similar to the function of

the egocentric I that "has the same sense whenever it is used but its reference is context-sensitive" (2003, 274). "I that am" is the context for Boolean logic then, rather than the universal "God like I"[16] that is the context for philosophical reasoning. It is also the basic assertion of Heidegger's *Dasein* that "each of ourselves is, the being that each of us touches upon in the basic assertion 'I am'" (Salles, 49). Yet, John Salles continues, "*Dasein* is not something that we can observe or prove but rather something that we *are"(*49).[17] I will leave a fuller discussion of *Dasein* until later but the point to be made here is that while Boolean logic is clearly ontologically committed to the *what* as argued by Corcoran, it is also, like Dasein, focused on the temporal *how* it is that we are in the world, in the sense that 1 is not a fixed constant but a variable state that alternates with Nothing – 0.

Thus the logic of Matheson's statement "I am the only one that got it right" operates within the Boolean framework of a *universe of discourse*. *It* then becomes a key delimiter in the statement: if *it* is taken as specified by a *universe of discourse* then it is affirmed by a discourse that accepts the necessity of a transcendent absolute that the statement operates within. On the other hand, if *I* is taken as a universal, then the statement still defers credence to some transcendent absolute.

From this comparison we can start to see that Boolean logic does not overcome the issue of Descartian absolute transcendence; rather, it simply makes it *temporally* irrelevant. The 0 and 1 in Boolean logic and the one and the zero in an 8-bit byte, are then *relative* absolutes. They are discrete yet continuous within a specified context – a context which takes out of contention the epistemic question that necessitates transcendence, in order to establish a relative truth. Defining a *universe of discourse* for logic does not mean that other discourses disappear. Logic defined thus can never be totally discrete, as the Boolean 1 will always exist in relation to the potential of 0. Thus when we are trying to apply Boolean axioms to a specific context we confront a paradox.

Lewis' definition of discreteness – the computational digital, represented as a binary bit – is thus anything but discrete as it is taken as being within a *universe of discourse* of the byte – a byte that only provides *sufficient reason* in the context of another system. Rather than the discrete being defined by something that is finite or something that is defined within a priori limits, the discrete exists by virtue of the fact that *it* first defines theses limits. Effectively this amounts to the same thing as ignoring the epistemic challenge of limited logic, and focusing only on the ontological consequences of reasoning, which are of course inherently reasonable.

It is clear, then, from this analysis that while mathematical logic as presented by Boole makes its claim to knowledge on the basis of absolute values that negate transcendence, this absolute is methodologically self-defining. It methodologically establishes its own ontological terms of reference - terms that evade epistemic scrutiny because they are a priori. The digital is discrete because, like the *ontological proof,* its discrete logic logically establishes its own discreteness. Discrete entities are then logically transcendent in no lesser way than Descartes' *ontological proof: both* ontologically ensure their own existence. The digital is discrete because it ontologically defines itself as such by bracketing out epistemological considerations.

To accept the *universe of discourse* established by Boolean logic we must first accept the construct of logic in the same way that Descartes accepts God as the "limits of discourse are co-extensive with those of the universe" (Boole, 30). Both are thus logically transcendent absolutes that sit beyond logical reason. As Corcoran notes, Boole was only too aware of the epistemic implications that "the mental process of formulating a propositional thought begins with the act of conceiving of the universe of discourse" (Corcoran 275): in which case it can hardly be considered as discrete. The result is that in "*Laws of Thought* this view is in a way more explicit and in a way less explicit" (Corcoran, 275). Boole

also spells out the need for the *universe of discourse* and its broader methodological implications:

> *The question then arises, whether it is necessary to restrict the application of these symbolic laws and processes by the same conditions of interpretability under which knowledge of them is obtained. If such restriction is necessary, it is manifest that no such thing as a general method in logic is possible. On the other hand, if such restriction is unnecessary, in what light are we to contemplate processes which appear to be uninterpretable in that sphere of thought which they are designed to aid? These questions do not belong to the science of Logic alone. They are equally pertinent to every developed form of reasoning which is based upon the employment of a symbolic language (Boole 48-49).*

The question posed here, then, is whether or not claims to knowledge can be made relative to the methods used to generate them. That is, can knowledge be defined within a restricted discourse; or do such claims to knowledge need to be made on the basis of more fundamental laws of thought, which are as we have seen reliant on a priori absolutes?

In regard to this research, a methodology premised on the l*aws of thought* is clearly as academically un-sound as it *logical*. Logic under these terms methodologically provides *sufficient reason* to validate any argument, just as a perfect God is proven to exist because he can never deceive us. It transcends. As if this *reductio ad absurdum* was not problematic enough, such methods are especially problematic for the subject at hand, where we consider whether the computational digital has become synonymous with logic. This is not only because this method logically self-predetermines an outcome within its universe of discourse, but because it also defaults validation to a transcendent absolute. Again, we end up with a tautological argument – that God is God because of

what God is, or that logic is logical because it is logical, or that the digital is discrete because it follows discrete logic. Thus it is clear that we will get no further in understanding the digital by using Boolean methods that are grounded in the laws of thought.

Having identified some of the limitations and problematics of applying logical methods in regard to research on the digital, I will now turn to a discussion of the relationship between logic and academic research, in order to place these methodological concerns in the context of artistic research.

A version of this paper was presented at the Transart Institute Winter Residency, EFA Project Space, 323 West 39th Street, 2nd floor, New York, NY 10018, 14 January 2015.

[1] As Danaher points out, these axioms were predated by other systems of knowledge production and also developed over time from the early formulation of philosophical laws proposed by Parmenides and Aristotle, through to the later relational definitions by Plato and, I would add, Leibniz (2015).

[2] This is of course not the sole criteria, but issues such as the knowledge being verifiable have been excluded for the sake of clarity, even though they too would conform to the laws of thought.

[3] *Sufficient reason* is a term coined by Gottfried Leibniz that argues necessary truth depends on the principle of non-contradiction in "which we believe no fact can be real or existing and no statement true unless it has sufficient reason why it should thus be and not otherwise" (1992, 99).

[4] 01001001 = I

[5] This statement assumes standard computational processing but does not extend to quantum-computing.

[6] "In fixed point digital representation for instance, a multi digital magnitude M depends as follows on several n~valued unidigital magnitudes u0, …, um-1 (Lewis, 326).

[7] Absolutism in philosophy is a position that argues there is a priori knowledge outside of thought. This is often specified in religious terms but is more broadly a transcendent proposition that can be applied to any subject that sits beyond our ability to know it, and is thus a priori (earlier) rather than a posteriori (later).

[8] See the Descartes Fifth Meditation (1996, 44-49).

[9] This would apply specifically to various forms of idealism that accept some form of transcendental ego.

[10] While Boole is a mathematician he also speaks directly to the relationship between the laws of thought and the sciences in general. "It is indeed scarcely possible to express the conclusions of natural science without borrowing the language of these conceptions" (Boole, 28).

[11] Boole proposes eight types of fundamental expression as extensions of Aristotelian logic in the form of Syllogisms and Conversions:

1. All Y's are X 's, y = vx .
2. No Y's are X 's, y = v (1 − x).
3. Some Y's are X 's, vy = vx .
4. Some Y's are not-X 's, vy = v (1 − x).
5. All not-Y's are X 's, 1 − y = vx.
6. No not-Y's are X 's, 1 − y = v (l − x).
7. Some not-Y's are X 's, v (l − y) = vx .
8. Some not-Y's are not-X 's, v (1 − y) = v (1 − x). (Boole. 175)

While bearing some direct comparisons to Aristotle's laws, which Boole generally accepted, his intention was to develop logic as a mathematical discipline rather than a philosophical one. (Corcoran, 2003). These were subsequently re-articulated as modern formal algebraic logic by Augustus De Morgan in terms of theorems referred to as the laws of Commutative, Associative, Distributive, Identity, Negation and Redundance.

[12] Where the conjunction *and* is denoted $\wedge$ the disjunction *or* is denoted $\vee$ and negation is denoted $\neg$.

[13] Or Boolean Algebra. Developed by Henry Sheffer after Boole, this consists of a set of rules which return either 1(true) or 0(false) (Huntington, 1933). Boolean logic thus forms the foundation of digital electronics and modern programming languages.

[14] See specifically pages 325 - 324 in Lewis' paper *Analog and Digital* for his mathematical formulation of digital representation.

[15] I will expand on the concept of *nothing* and its relation to *something* in section ???, but for now *nothing* can be taken as an absolute non-absolute in the sense that "A thing is nothing other than the difference between *that which is in the thing* and *that in which the thing is*" (Garcia, 2014, 13).

[16] "I AM WHO I AM", Exodus 3:14 (The Holy Bible, 1978)

[17] 1 in comparison to "I am" is both an absolute and a universal as we find in Colin M^C^Cahon's Victory over death 2, 1970. The work typifies the recurrent use of "I AM" in M^C^Cahon's paintings and directly quotes the New Testament (John 12:27, John 12:29, 30, John 12: 35, John 12: 36). However, the bold white I AM on the right of the painting is prefaced by a partially painted out AM on the left to read AM I AM and pose both the emphatic transcendent statement of singularity I AM, and the hesitant, self-doubting question AM I? Here I AM parallels Boole's universal 1 as being both all encompassing absolute and at the same time a specified class or individual, albeit one that is self doubting.

Subappendix 2

Post Screen Not Displayed

Abstract:

It seems that we are always waiting for screens. But what are we really waiting for? Treating the screen as an object of sculptural concern, this paper attempts to understand how inherent event-relationships might escape digital/analogue dualisms of the screen. Drawing on Graham Harman's constructs of things-in-themselves and Tristan Garcia's notions of compactness and intensity, the 'nonsense' of the indexical image is explored through discussion of the author's recent sculptural projects that challenge correlational assumptions about presence and the necessity of waiting for it

(Harman, 2011; Garcia, 2014).

This appendix is a transcription of the text from Appendix 6 In Receipt of (Post Screen Not Displayed), exhibited at The Exhibition Research Lab, Liverpool John Moores University, 13 - 24 March 2017. It was presented as a Keynote in the 2014 Post-Screen Festival: Device, Medium and Concept and published in the conference proceedings. It has not been released for publication here.

Subappendix 3

Stack Overflows and Digital Actions

This appendix is a transcription of the text from Appendix 6 *In Receipt of (Stack Overflows and Digital Actions)*, exhibited at The Exhibition Research Lab, Liverpool John Moores University, 13 - 24 March 2017. It was previously published as a chapter in Nicolas Salzar Sutil and Sita Popat's book Digital Movement, and has not been released for publication here.

Charlton, J. "Catch/bounce: Stack Overflows and Digital Actions." Digital Movement: Essays in Motion Technology and Performance. Ed. N. Salazar Sutil and S. Popat. N.p.: Palgrave MacMillian, 2014. 82-94. Print.

Subappendix 4

Algorithmic Offsets and Irreducible Formulas

As Buster Keaton edges his way around the walls of Samuel Beckett's *Film,* covering the potentially offensive gaze of objects, I can't help but feel that much more is as stake than the negation of the odd goldfish or parrot. Although it is now almost impossible to liberate this film from Deleuze's subsequent critique of it in *Cinema One*, I want to re-read *Film* in terms of the agency of *objects* so that we might reconsider both the nature of the time-based schema and its implications for sculptural practice. My intention is not to critique Deleuze but rather to use aspects of the movement-image as a way of furthering our understanding of objects and our engagement with them. This speculative proposition asks that we suspend – at least temporarily, the monopoly that time holds over our reading of objects, in part by rejecting correlational constructs in order to open up alternate models of materiality for consideration.

The use of the term *object* here is admittedly a little confusing as I am simultaneously drawing into consideration the temporal status of the sculptural *object* and the metaphysical *object* of Speculative Realism. I do this so that we can begin to rethinking the way that materiality is constituted not as the property of an object but as a result of a shared agency between objects.

While this notion of a co-constituted materiality is not articulated as such by Speculative Realists like Graham Harman, it is clearly at the root of his analysis of *objects* in the recently published "Seventy-Six Theses on Object-Oriented Philosophy" (Harman, 2013). Not only does this incomplete paper – it was initially one hundred theses but he apparently lost interest – provide one of the most succinct outlines of Speculative Realism core tenants, it clarifies Harman's vision of *objects* and in particular Harman's own contribution to Speculative Realism – Object Oriented Ontology. To limit the scope of this paper I will use Harman's position as generally reflecting Speculative Realist thinking while acknowledging that this is still an emergent and contested field.

As much as Tim Morton's notepad sketch of Harman's *quadruple object* appeals to my romantic artistic sensibilities, it requires some unpacking so that we can understand how Harman ontologically breaks down the *objects* distinguishing between key elements that he suggests constitute all *objects*.

While Harman's objects seem quite content within the structure he lays out, there seems to be no clear articulation of a method through which these *objects* interact. Harman's *objects* seem isolated – totally withdrawn form the world and other objects to which they are never directly knowable (Harman, 2013, p. 176).

"Access to things themselves can only be indirect." (Harman, 2011, p. 73)

So my purpose of outlining Harman's object schema here is to provide some sort of framework for trying to understand how *objects* interact with each other rather than remaining isolated and locked in stasis (Harman, 2011, p. 130). Effectively I want to consider just how Buster Keaton's character 'O' ever engages with the goldfish and the parrot.

It is not the connections between the various parts of Harman's objects that I find problematic, rather it is intentional relations between objects that seem irreconcilable without recourse to some unspecified element that exists outside of this *ontography*. Reliance on some form of occasionalism seems too easily dismissive of the problem and fundamentally correlational by nature. So when Harman talks about resolving the tension between objects through some sort of *fusion,* he really brings us no closer to understanding how that contact is initiated.

"Fusion is required to between the real object and its sensual qualities…"(Harman, 2011, p. 126)

"What is required in these cases, if anything new is ever to happen, is

fission between the two poles." (Harman, 2011, p. 126)

"For me real objects are withdrawn objects that also have withdrawn real qualities. We can't have direct access to the real qualities of an orange any more than we can have direct access to the orange as a real unified object." (Harman, 2013, p. 176)

Without such intentionality we seem to be left with a bunch of things wafting around but totally unable to engage with, perceive off, or be perceived by each other. For such an encounter would only be possible if an object were to reveal its *sensual qualities* - something that according to Harman, only another object can do (Harman, 2013, p. 60).

"Sensual objects exist only insofar as some perceiver is occupied with them." (Harman, 2013, p. 60)

Stuck in an endlessly recursive loop there is no way for any object to engage another object - to expose its sensual self. Such causational impotency would result in a solipsistic world in which nothing outside itself is knowable and certainly one in which no *real* interaction between objects might occur. But without regressing into the nothingness of Harman's *fusion*, Bennet's *vitality* or Meillassoux's *ancestral time,* I want to try and resolve the problem of intentionality within Harman's OOO by focusing on time and space, for it is these that Harman problematizes as the cause of tension within objects (Harman, 2011, p. 126; Bennett, 2010, p. 8; Mellasioux).

"Space is the dual between these sensual qualities and the mysterious real objects…" (Harman, 2013, p. 65).

"Time is the fissure between sensual objects and their swirling and vacillating sensual qualities." (Harman, 2013. p. 65)

Time for Harman appears to be as paradoxical as Zeno's arrow which once launched, can never reach its target by definition of having to travel half the distance first. The arrow, like Harman's object, is inevitably separated from its target by ever-divisible increments. It passes through space but not through time that is of seemingly endless duration. Suspended in this way, the arrow is a motionless object at rest in every instant of its flight – a freeze-frame in the narrative of movement (Lanza).

Objects, then, like the cat in *Film*, are again stuck in a moment of endless duration. Incapable of moving beyond the frame they occupy, they seem destined to endlessly repeat themselves as they withdraw inwards within their own frame of action? But clearly the moment we are seeing in *Film* is not the static moment of a single frame, rather it is a cinematic instant – an immobile instant within a mobile section of duration (Deleuze, 1986, p. 8).

Although such a sequence is not the focus of Deleuze's analysis of this film it clearly illustrates the relationship between the movement image and Zeno's paradox. Focusing more on the subject than the action, Deleuze is intent on exploring the "extinction of subjective perception" as it relates to Bergson's movement-image (Deleuze, 1986, p. 67). However in positing varieties of movement-image – perception-image, action-images and affection-images – Deleuze provides a decentered model of time and duration that seems directly comparable to Zeno's motionless arrow.

Like the movement-image the arrow becomes itself only in a "bloc of space-time" that makes space a kind of retrospective construct (Deleuze, 1986, p.68). Once the arrow moves towards the target we are able to draw a line backward in time towards its previous position. In this way, the arrow-object occupies two places at the same time. In order that we can understand its movement, the arrow-object establishes a geometry that both separates it from, and binds it to, the schema (Deleuze, 1986, p.13). Space-time appears as a geometry in which time is conceived of as a

point, rather than a line, in a way that parallels the construct of a point vector in which movement is defined by start and end points, rather than by the line-duration itself.

Aspects of this geometry are found in my recent work 32Bit Catch in which a ball is thrown against a wall and caught again thirty-two times. The video starts with a blank wall defined by the optically distorted corner towards the left of the screen. The footage is highly compressed – the almost monochrome image is reminiscent of pre-digital video works.[4] Only when an arm enters the frame on the right of the screen are we aware that the video is in slow motion. The arm is shown disembodied by the framing of the camera – it is *an* arm, not a specific arm. The body it belongs to is never declared and we never confront its subjective perception. Gradually, the hand holding the ball primes itself to throw. In the moment preceding the release of the ball the video cuts – we hear a dull thud and the ball is suddenly hitting the wall on the left and bouncing back. Until now the video has been silent. No sooner has it bounced back than the video cuts again, and suddenly the ball is back in the disembodied hand. Each thirty-two frame segment is repeated thirty-two times, punctuated by the sound of the ball hitting the wall.

Initially 32-Bit Catch may seem to be in contradiction with Zeno's paradox as the vector has been edited out. All we are shown is the ends of the vector – the arrow at the beginning and end of its path. We never actually see the ball in flight along its trajectory; rather we are shown the points of contact between the ball and body and between the ball and wall.

However, once the ball hits the wall for the first time we draw a line backward in time to its last known position in the hand. Movement outside of each "*bloc of space-time*" is constructed by joining the dots. Each *bloc* of film seems to operate as "*mobile section of duration*" which changes the duration of the whole (Deleuze, 1986, p. 8). Not only do we

understand the relationship between the hand throwing and the ball bouncing but we construct a new duration of the whole from these actions.

In fact, when the hand finally stops throwing the ball and disappears from the screen, we are surprised - there is no apparent reason why this cycle should be interrupted. The bounce and the throw might endlessly reciprocate each other – each projecting the trajectory of the ball back to the action of other. In the continuity of this *montage* each becomes its own past and future as it coexists in the moment of the image. In this bidirectional projection of itself the catch/bounce movement-image has become "inseparable from the before and after which belong to it" (Deleuze, 1989, p.38).

But my purpose here is not to explore this work in relation to Deleuze's movement image, rather to use it as a conduit for considering how the movement-image as an object that is inseparable from its before and after, might assist in addressing the inaccessibility of Harman's sensual objects.

Considering 32 Bit Catch as an action rather than a film, the parallels to Zeno's arrow will already be apparent. As the hand primes to throw we map a trajectory for the ball and construct a vector between the hand and the wall. But is its also possible to see an action-of-intent projecting both forward in time from the ball towards the target, and backward in time along the vector to the hand. It is as if the ball, the wall and the hand were exerting influence over each other beyond their boundaries as physical objects. They seem to overlap and produce inter-subjective secondary subjects; the ball-body and ball-wall.

This inter-subjective gesture is realized not in the literal grasping of the ball, but in the agency exerted beyond the point of contact. As the ball bounces off the wall back towards the body, the arm anticipates it. It

reaches beyond itself – not in the physical sense of reaching out for the ball, but in the projection of itself forward in time into the trajectory of the ball. In this way the body is ahead of itself in time and open to "a future with no present to speak of" (Massumi, 2002).

As Massumi acknowledges, it is Deleuze who opens up this connection between the body and its position, specifically when he breaks down the movement image and specifies the affection-image as occupying "the interval between incoming perception and outgoing action; it is, one might say, in the interval itself" (Deleuze, 1986, p. 37). Each inter-subjective action, like Deleuze's movement-image, is a moment that is past itself as soon as it comes into being.

Developing Deleuze's Bergsonian *preformism* – "a real that is ready-made, preformed, pre-existent to itself" (Deleuze, 1991, p. 98), Massumi extends the reading of the *image* into a relational process of becoming in which an object "does not coincide with itself. It coincides with its own transition…' (Massumi, 2002, p. 4). Rather than trying to understand how static objects can connect, Massumi proposes process as the primary condition of being. "The problem is no longer to explain how there can be change given positioning. The problem is to explain the wonder that there can be stasis given the primacy of process." (Massumi, 2002, p.8)

In drawing our attention away from the ball-body /ball-wall '*blocs of space-time* Massumi reverses the vector construct as definitive of movement, in favour of the line-duration as determinate of position. Objects, then, like the movement-image are in a constant state of becoming. But unlike the movement-image, which projects into time to construct movement, movement itself – the relations between objects – creates inter-subjective objects.

Nathanial Stern clarifies this when, following Massumi, he defines objects as events – "substanceless and durationless moment(s) whose reality is

that of potential – pure relationality" (Massumi as cited in Stern, 2013, p. 74). In developing an argument for the Implict Body, Stern posits the body as constituted by its relations with subjects, subjects that it cannot quite reach. Like the movement image the Implicit Body is, for Stern, always in a state of becoming in which both subjects and objects are inter-given – existing only as in-process relations with others that themselves are in-process. Although Stern reportedly finds Speculative Realist principles self defeating, his position aligns with Harman's *sensual-objects* that "exists only insofar as some perceiver is occupied with" them (Stern, 2014; Harman, 2013, p.60).

It is, then, Sterns implicit body that we see in ØForm, a 2011 work in which a Kinect is used to track the spatial coordinates of the artist's hands in order to generate real-time 3D forms within CAD software. As the artist's hands enter the capture space and initiate a form on the screen, it becomes evident that this is not like like modelling clay – the normal spatial alignment of the body with materials is estranged. Offset by software algorithms, position is no longer determined directly by the location of a hand in space but by the relative distance between the hands. Similarly, scale is dissociated from action by using screen co-ordinates to define x y dimensions. The intense concentration required to over-ride the body's spatial schema is evident as the artist struggles to re-learn spatial relations.

But this is not so much an exertion of agency by the on-screen form over body, as the body has no direct access to the form. The form is withdrawn from it by the computational process. The body reaches out not towards the shapes appearing on the screen but to the algorithmic *objects* that offset it from the form. Both the body, screen and algorithm are objects in this sense.

Not only is the on-screen object in a process of becoming, but both the body and algorithm objects become themselves in the schema of the

work. All three objects are inter-given instantiation that yield and demand of the each other to contrive the materiality of the work. But the algorithm doesn't stop there because each new inter-subjective object becomes its own object in Speculative Realist terms. So we now have at least six objects in the work: the body-object, algorithm-object and screen-object as well as the body/algorithm-object, body/screen-object and the screen/algorithm-object. But by the same mind-numbing logic, we must then consider the possibility of a body/screen-body/algorithm-object and so on to infinity or oblivion, whichever comes first! While this train of thought will not be developed in full here the point is that even such exponentially generative inter-subjective actions do not exhaust their subjects. As Harman explains, an object is not exhausted by its relations with other objects, its thus always in excess of itself as it reaches out to the world:

Our perception of things and our practical handling of them does not exhaust the reality of things; each thing is an inexhaustible surplus. (Harman, 2013, p. 60)

Yet neither object, body or the algorithm collapse inward under this infinite load that threatens to deplete them of everything that they are. It is hard to imagine what would result if this were to happen – possibly through some chain reaction, an object with the density of a black-hole would suck everything into it? So real-objects are apparently as irreducible as they are inaccessible, only part of them having been made available through the sensual object. This is why Harman says "being is that which withdrawsœ (Harman, 2013, p. 267). Like the moving-image objects withdraw themselves from the present as they constantly throw themselves forward into the future and backwards into the past.

Being is that which withdraws: always absent, always irreducible to any perception or conceptualisation of it, so that we can only have indirect or oblique access to it. (Harman, 2013, p.267)

We cannot reduce the on-screen image to the actions of the body as the screen is its own object. In the same way the body cannot be reduced to an algorithm, as it is inter-subjectivly constituted in the moment. Rather, it is the action-in-the moment that brings the sensual-object into the present and makes it available. Like Sterns inter-subjective implicit body, it is movement that reconciles the inter-connectedness of real-objects and propels the object beyond the moment of its existence to break down the "irreducible formulas: real movement concrete duration" (Deleuze, 1986).

It seems that objects, rather than being locked into themselves, might be like *movement-image blocs* that are brought into contact with the whole by actions that cannot be separated from the objects itself. Action in this sense is not something that is applied to objects like gravity, but rather something that is integral to the nature of objects themselves. Constituted by inherent actions that position them beyond where they are, objects seem not to need any externally directed 'intention' as they are already engaged with other objects ahead of themselves.

Objects then, rather than being like irreducible black-holes of intent, might be more like inexhaustible supernovas that algorithmically make available the sensuality of objects to each other.

Transcript from a verbal presention at *Action Delay Symposium* in AUT University, Auckland, 31 May 2014.

Subappendix 5

On Remembering a Post-Digital Future.

Permission to include the following full text article has been granted by Geoff Cox the Series Editor for APRJA.

We have always been post-digital or at least I cannot recall a time when art wasn't.

To claim this is surely ridiculous, as the *post* condition demands the prior instantiation of a digital state that purportedly did not begin until the mid 1970s.[1] Yet if, for a moment, we entertain the idea that art *has* always been post-digital, in what way might this make sense? How might this enable a re-reading of *pre-digital* practices and inform our understanding of future *post-digital*[2] practice?

The case of a post-digital anthrax

In pursuing this question we should of course take note of the precedent of Latour's *We Have Never Been Modern* (Latour, *Reassembling the Social* 17). In its function as antecedent to the Post-Modern, Latour's claim appears *not* to be susceptible to the same redundancy as that made in regard to the post-digital. The modern does not after all explicitly refer to its precedents in the way the terms post-modern or post-digital might. However, in Latour's attempt to reconnect the social and the natural worlds by denying the distinction between nature and culture, *We Have Never Been Modern* operates from a similar retroactive position – a position in which the Modern assumes distinction from that which came before it. In this sense the Modern, too, was always *post* conditional. This is not simply a case of semantic positioning but reflects fundamental aspects of Latour's work on irreductions in regard to discovery and prior events.

"*We always state retrospectively the previous existence of something, which is then said to have been discovered*" (Latour, *The Pasteurization of France* 84).

In as much as naming something might be considered a discovery of sorts, the post-digital has always existed just as anthrax bacillus existed before Pasteur named it (Latour, 1988). Discovery is not creation. More than this then, naming, like discovery, works backward in time, creating that which existed before its existence was known.[3] "*Once again time does not move in one direction*" (Latour, *The Pasteurization of France* 145).

In arguing as he has that time is a configurable control mechanism pursuant to a force of labour beyond subjective or objective perception (Latour, *Aramis, Or, The Love of Technology* 88), Latour challenges an anthropocentric worldview that promotes humans as the arbitrator of existence. The post-digital, like anthrax, may always have existed. It is not a state created by our observance of it or something metaphysically conjured up exclusively for our amusement. It may previously quite happily have gone about its business un-disturbed by human interest.

While the logic of a mind-independent existence is clearly viable in regard to extant entities such as anthrax, we must go one step further to accept phenomena such as the post-digital in this way. For surely a human idea cannot exist before it was thought of?

Extending Latour's assertion that the world is comprised of relational networks formed by independent actants, Graham Harman's Object Oriented Ontology (OOO) allows for thoughts to operate as active agents that are on an equal footing with objects (Harman). For Harman, ideas are simply objects and thus capable of existing independently of our recognition of them. Here there is a subtle but significant difference with Latour's notion of irreduction as it affects our reading of the post-digital. Harman's light-hearted aside that "I am a genius in something that doesn't exist yet" (Harman) should be read not as claiming that all ideas have been thought and are simply waiting for humans to discover them – this would suggest some universalizing aperion that Harman clearly rejects. Rather Harman's statement should be seen as talking about the

phenomena of *being* a genius rather than the subject of his genius. Thus it can only be in hindsight of brilliance that we declare someone to be *a* genius, as the knowledge they have *created* becomes recognized. The idea of genius, like the idea of the post-digital, is like a programming variable waiting for instantiation; it must be declared before it can be defined.

We must consider, then, the possibility that the post-digital as a recognition-independent phenomenon existed not simply before Nicholas Negroponte claimed the digital revolution to be over in 1998 (Negroponte), *or* Kim Cascone coined the term in 2000 (Cascone), but before the digital itself.

Indeed Cascone, in coining the term, grounds the post-digital in pre-digital practices of the early twentieth century.[4] It is, according to Cascone, this shift in focus from foreground to background – from notes to noise – which leads to the *glitch* in digital sound processing (Cascone 13). While Cascone tends to draw on historical practices as precursors to the emergence of the post-digital glitch, I want to suggest that practices such as those of John Cage and Futurists are not simple groundwork for an emergent genre but are in fact recognition of an existing post-digital practice – if you like, the post-digital before the '*discovery*' of the post-digital.

In this sense, the post-digital might be far closer to Latour's anthrax bacillus than first acknowledged. It, too, may have been quite happily going about its business oblivious to the accolade of critical recognition. Furthermore if Cascone can find examples of the post-digital before even the digital era, the very nature of the digital must also be called into question.

Grounding the rabbit hole

Before we chase our own post-digital rabbit-tail down a futile, rhetorical rabbit hole, it would be sensible to ground this argument within a digital ontology in the hope that it may provide some terra firma in which to burrow.

If the digital is grounded in the material world as John Wheeler would have us believe, it should help solidify the position of the post-digital as a state of practice (Wheeler 311).

At the bottom of Wheeler's ontological rabbit hole is the '*it* from the *bit*' (Wheeler 309) – the notion that every aspect of the physical world stems from a yes/no immaterial source. *It from bit* brings an abrupt dead-end to the rabbit hole and levels the ground by reducing the aperion that is so scorned by Harman and other Sceptical Realists, to a simple binary decision at the lowest level. There is no master plan or grand scheme; simply a 0 and 1 – a digital response in which nothingness cedes to physics through the act of observation.

This binary function is the fundamental nature of the digital that operates as a set of discrete packets of information as opposed to the analogue that adopts a smooth and continuous state. The oppositional relationship between the digital and the analogue that is the basis for Digital Philosophy's claim that the world is ultimately finite (Miller) stems from Lewis's mathematically grounded definitions of the digital as discrete, and the analogue as continuous forms of representation (Lewis, 321).

Indeed, the seduction of the digital era was the distinction that it drew in regards to the analogue by offering an enlightenment in which each unit was perfect and infallible – infinitely lossless re/production at all levels. The analogue, by contrast, with its lax attitude to the world, was degenerate and impure.

If anything, the post-digital is a rejection of this either/or dichotomy and an acknowledgment that an epistemic agent cannot establish whether nature is analogue or digital in nature (Floridi, Against Digital Ontology 160). It simply does not follow that the world is ontologically either digital or analogue simply because it appears so.

Instead we are left with the alternative position that the perception of a discrete or continuous mode is dependent on the level of abstraction assumed by an epistemic agent. As Lucciano Florridi's level of abstraction argument succinctly puts it, "reality can be observed as being either digital or analogue, depending on the epistemic position of the observer … and the level of abstraction adopted" (Floridi, 161). Drawing both on Kant's antinomies and Young's interference experiment, Florridi[5] suggests that the oppositional digital / analogue framework that Wheeler's "its from bits" relies on, is untenable (Floridi 168-172).

In refuting the distinction between the analogue and the digital, it is as if Florridi has stripped non-human agents of agency and reduced matter to an indeterminate grey mush in which the digital and the analog are only distinguished in our perception of them. Although verging on an anthropocentric model, how, within such a framework, can we understand the nature of digital materiality that is central to our positioning of post-digital art practice?

As the digital loses its allure in the afterglow, as Transmediale's 2014 thematic statement proposes (Transmediale 2014), we have seen the proliferation of practices that are distinctly or inherently disinterested in the distinction between digital and analogue materiality. The digital has become simply another studio material that no longer assumes a privileged position as it vies for studio space alongside paint and plaster. Indeed the fusion of digital and analogue functions – as typified by 3D

printing, robotics and sensor inclusive practices – exemplifies the untenable position of an "its from bits" argument that promotes a universal materiality.

Instead we see an engagement with materiality from the perspective of the work – a sort of conceptual-materialism that brings both analogue and digital materiality into play with each other. But how do either analogue or digital states possess materiality as non-corporeal concepts, neither being bound to a substance?

While affirming material agency, binding materiality to substance denies objects the potential of a primary role in a Latourian network and denies the idea of equity between physical and metaphysical objects that is proposed by Sceptical Realism. Instead, materiality might be treated as a non-corporeal state that is distinguished from material substance not just by a parallel etymology[6] but rather, as Kant suggests in his treatment of material as differentiated from substance[7] (Kant 24-27), and Heidegger in his assertion of "thingness" that "does not lie at all in the material of which it consists, but in the void that holds it" (Heidegger 167). While both Kant and Heidegger support in different ways the reading of substance-independent materiality, they maintain an anthropocentric position[8] that conflicts with the flat ontology of Sceptical Realism.

It is Graham Harman again who reconciles this anthropocentric conflict in his critique of Heidegger's Zuhandenheit – readiness-to-hand (Harman, *Tool-being 19)*. In Harman's theory of objects[9], objects are not ontologically exhausted by human perception. They remain independent and able to enter into a non-human Latourian network. If materiality is neither a default state of substance nor an attribute of human perception, the very idea of materiality seems doubtful unless we allow for a form of co-constitution that is formed by the relata between objects.

It is precisely this co-dependent dynamic between human and non-human actants that Leonardi clarifies in regard to digital-media (Leonardi 13). Arguing for a definition of materiality that is inclusive of instantiations of non-corporeal agents, Leonardi stresses the affordance of materials rather than their physical properties, stating that it is in the interaction between artefacts and humans that the materiality is constituted.

This alternative, relational definition moves materiality 'out of the artefact' and into the space of the interactions between people and artefacts. No matter whether those artefacts are physical or digital, their materiality is determined to a substantial degree by when, how and why they are used. These definitions imply that materiality is not a property of artefacts but a product of the relationships between artefacts and the people who produce and consume them' (Leonardi 13).

At risk of falling into another anthropocentric stance, Leonardi fails to extend the argument to allow for a materiality constituted solely between non-human actants. Drawing again on Heidegger we can see how – in the example of the jug (Heidegger, 20) – materiality is defined by a co-constitutional relation with the water that fills it.

Co-constituted materiality then might be thought about as an Object Orientated Philosophy form of Merleau-Ponty's *'intentional-arc'* in which the object extends beyond itself while remaining within itself. To reinterpret Young's reading of Merleau-Ponty: co-constituted objects such as materiality thus loop through objects, loop though objects and the world and loop through the objects and the virtual world (Young 65).

It is the ability of the co-constituted object to overreach itself while remaining embodied, to transcend subjectivity by entering into a relational schema, that emerges as a method by which materiality is actualised. Materiality is both an independent object – in an OOO sense –

and an object that is dependent on the structural method of the actant network that realises it. Of course, this definition of materiality as a structural method applies equally to both analogue and digital modes. In fact, it is these continuous and discrete states that constitute the underlying structural methods, which ultimately underpin materiality.

The term 'structural method' is perhaps confusing given that it tends to suggest an alliance with Structuralism that, through its anthropocentric stance appears to conflict with OOO flat ontology. Indeed, this is the problem that Jane Bennett addresses as she attempts to navigate around "the throbbing whole of relations" with her formulation of *vital matter* (Harman Materialism Is Not the Solution). While Bennett's vibrant materialism seems to dabble a little too much in the occult of the Latourian plasma,[10] her development of Deleuze and Guattari's *assemblage* grounds materiality in method *(Bennett 23)*. Like a structural method, Bennett's assemblages are emergent properties that are distinct from each actant. In a state of becoming, an assemblage emphasises the dynamic method through which parts are related and from which the underlying materiality of practice is derived. Digital materiality, then, is a method of practice that promotes discrete structures regardless of the ontological affiliation of its constituted parts.

The life of Zoog – a Post-Proposition

The central role of structural method in materiality is played out in the more than confusing linguistic parallels between Object Oriented Programming (OOP)[11] and Object Oriented Ontology (OOO). As a core feature of the OOP, the nature of the object as an abstract concept has clear parallels to the nature of physical objects, to the extent that in many introductory OOP texts the first object class named is a Person, Car or, as is the case with Daniel Shiffman, a Zoog – a '*Processing*-born being'

(Shiffman, 16). Shiffman's Zoog, like a person, has a childhood, must learn to walk and eventually reproduce through the programmed Variables, Conditionals and Functions that define it.

Object Oriented Programming's use of concepts like object, inheritance and encapsulation are more than metaphorical aids. They are indicative of the interconnectedness of physical and technological digital materiality that grounds the digital in a material structural method well before Kim Cascone's work on The Aesthetics of Failure recognised post-digital disillusionment. (Cascone)

"Object oriented methodology with a promise "… *everything in life is an object*" seemed more like commonsense even before it was proven to be meaningful."(Mehta)

It is no surprise, then, that OOP terminology emerged at MIT in the early 1960s[12] at precisely the time when Lucy Lippard's 'ultra-conceptual' artists were dematerialising the art object and rethinking materiality. As Jacob Lillemose explains, Lippard's dematerialisation of art as an object is not an argument for the disappearance of materiality, but a rethinking of materiality in conceptual terms (Lillemose). When Lippard describes conceptual art as having emerged from two directions – "art as idea and art as action" (Lippard, ix) – she failed to recognise that an action can be an idea, and thus the misnomer that conceptual art is not concerned with materiality doesn't hold.[13]

"[I]nstead of understanding dematerialization as a negation or dismissal of materiality as such, it can be comprehended as an extensive and fundamental rethinking of the multiplicity of materiality beyond its connection to the entity of the object." (Lillemose)

Meanwhile, around the same time, in MIT computer labs OOP was

attempting to make sense of dematerialised objects by establishing a programming structure grounded in material objects. While I accept the argument that, like most metaphorical terms, OOP's object analogy now wears thin through over use (Ewert), I also assert that OOP's ability to model the world is less significant than its ability to inform the world about its own material state. In developing a programming language grounded in object metaphor, OOP reflected back to us something new about the state of the material world – the structural methods that underpin objects.

While we can thus see both the development of OOP and the dematerialisation of art as symptomatic of a broader desire to re-engage with materiality,[14] seminal conceptual art works such as Alan Kaprow's *18 Happenings in Six Parts*, 1959,[15] deepen the connection by engaging systems that are clearly aligned to digital structural methods.[16]

Kaprow's Happenings generated an environment that immersed the viewer inside the work, not just by putting them inside the performative space but by making them active agents in the work through tightly prescribed instructions that, in the case of *18 Happenings in Six Parts*, fragmented narrative by breaking the audience up, moving them around and creating ambiguous 'free' time within the work (Rodenbeck).

Kaprow can be seen as effectively treating both human (performers and audience) and non-human objects as programmable units that execute simple 'non-matrixed' actions that embody and make the idea concrete (Kirby 35). Their function as programmable objects within the work is discrete and autonomous. Each actant is performing a task that is self-contained and digital in a way that parallels methods of encapsulation and instantiation in OOP.

What I propose is occurring in *18 Happenings in Six Parts* (Kaprow), then, is an instance of a digital structural method that is a function of both a

shared agency and a fragmented isolation that relocates the individual at the spatiotemporal centre of the materiality that is the work. What we have is not one continuous material but multiple co-constituted materialities, all of which are inter-connected in the relational network of the piece.

In illustrating the ability of non-technological practices to realise a digital materiality by operating through a digital structural method, the work liberates the digital from technology and from the specific delineators of the digital era. The digital is no longer the exclusive domain of the computer. It is a material state defined by a structural method. The potential for the digital to exist prior to the advent of digital technology re-positions not only the digital but also the post-digital, which might now be considered as more than simply a refutation of digital technologies.

The idea that art *has* always been post-digital now seems less ludicrous not simply because the digital has been shown as an enduring material state but because of the parallels between post-digital disillusionment and an unbounded digital materiality.

The post-digital's disinterest in the distinction between digital and analogue materiality is a levelling of the material playing field so that any distinction between them is no longer the definitive factor. Both are objects not as form but as method. In an ironic twist, the promises of a digital immateriality made by technology have instead found reality in the co-constituted interactions of human and non-human agents as material methods.

As a structural method, *the digital* is not dependent on the technological constructs of the digital era that it is commonly associated with. The body – perhaps the most analogue of all objects – has been shown, through the example of Kaprow's work, as capable of constructing a co-constituted

digital structure, thus chronologically freeing *the digital* from specific media histories. In this sense "*the digital*" predates the development of digital-technologies, rather than being a condition determined by it.

After the coup?

If a new materiality in the guise of the post-digital has risen up and overthrown the governance of technologies that have for so long appeared to dictate its condition, what comes next? Is the new regime as susceptible to corruption as the old, or are we witnessing some new world order?

If the digital afterglow attempts to find anything, it is not a new pathway in the wasteland of the digital aftermath (Transmediale, 2014), but the retracing of a pathway that appeared long buried in the plethora of digital gadgetry that litters the material landscape.

There is nothing new about the post-digital, at least not in the sense of it being chronologically tethered to the digital era. Rather, the post-digital is a renewed interest in the materiality of the world that includes digital materiality. It is the epiphany that the digital, as a structural method, was a material long before the first 8-bit string.

The rethinking of digital practices as proposed by the post-digital is not really that radical after all, then. While it may be that the so-called post-digital is a symptom of resistance to the commodification of digital culture, it is not simply a nostalgic yearning for the Jurassic technologies as postulated by Andersen and Pold (Andersen). The post-digital might instead be considered as a *neo-material* state in which the materiality of "objects" is better understood not as a physical condition but in non-corporeal terms as a relational structural method.

Although *neo-materialism,* in its Marxist positioning of human subjects as objects of labour (Simon 5), shares much in common with the post-digital's rejection of the technological object, my use of the term here is in regard to the materiality of the digital and the post-digital. In this way, *the post-digital* is an affirmation of the significance of method rather than form in materiality, in a way that is not only compatible with a *neo-material* positioning of labour relations but a further affirmation of the relevance of Sceptical Realism's non-anthropocentric positioning of objects in regard to materiality.

Whatever we call this *rediscovered* state of materiality that is emerging as post-digital, it is not a cybernetic post-human fusion of the co-constituted technological flesh in which the digital is grafted onto the body to realise a new materiality (Mitchell 221).

Even if the *neo-material* body turns out to be digital after all, as it might conceivably do once we accept materiality as structural method, this is not a wetware art dream in which we find out that the body has always been digital. Far from being a dream, though, the so-called post-digital has simply woken us up to what other, non-human, objects knew all along.

Art has always been post-digital; we are only now remembering that it is.

[1] Although there is no definitive starting point I take the release of the Apple-1 in 1976 as marking the proliferation of digital technologies typified by the digital age and marking a point at which *the digital* became analogous with the technological rather than to its function as a structural method as I have previously argued. (Charlton).

[2] Although this paper hopefully makes some contribution to ongoing debates about the post-digital I am not interested in define it as such here. Rather accepting Cramer's position on the post-digital regarding the redundancy of differentiating between digital and analogue states, I seek to understand how this might play out in regards to notions of materiality (Cramer, 162-166).

[3] Georgios Papadopoulos has suggested that it is important to distinguish between natural facts and human constructs such as the post-digital (Papadopoulos). While this question requires fuller elaboration, that is outside the scope of this paper, the terms in which I reframe a co-constituted post-digital materiality here leave open the possibility that a socially constructed structural method can pre-date the awareness of its human agents. To think otherwise would seem to support an anthropocentric model that works against a flat ontology. It is also possible if not probable that humans engage in social structures without having a global awareness of their actions. Certainly there seem to be ample examples from male chauvinism to post-structuralism that support this contention. Post-structuralism and for that matter the post-digital did not exist simply because two words were conjugated! It existed as a condition of *practice* in order for it to be named as such.

[4] Cascone identifies both the Futurists and Cageian attention to noise from the 1950s as key identifiers of post-digital music.

[5] Florridi's papers against a digital ontology lay the groundwork for Informational Structural Realism.

[6] As explained by JeeHee Hong, material and materiality are ambivalent terms that refer both to physical and non-physical matter (Hong).

[7] That the philosophical concept of substance is an *a priori* condition for our experience.

[8] For Heidegger, "humans are both a kind of entity and the clearing in which entities can be manifest" (Dombrowski 27).

[9] First laid out in Tool-Being 2002 and later developed by Levi Bryant into Object Oriented Ontology in 2009.

[10] In Resembling the Social, Latour defines plasma as an epistemic agent. "I call this background *plasma*, namely that which is not yet formatted…" (Latour 244).

[11] OOP is a programming language organized around objects rather than actions.

[12] Although Simula 1965 is the first recognized OOP language its origins can found in MIT's artificial intelligence group work in the late 1950's and Ivan Sutherland's Sketchpad, 1963) http://www.computerhistory.org/timeline/?category=sl

[13] Lippard acknowledges the deficiencies off the term in regard to materiality of objects in the preface to Six Year: The dematerialization of the art object … (Lippard, 1973).

[14] The Counterculture movement of the 1960's is taken as a rethinking of materiality as an idea and in action.

[15] Kaprow's Happenings are seen as 'a touchstone for nearly every discussion of new media as it relates to interactivity in art' (Wardrip-Frui 2003: 1). More than simply providing a precedent for current approaches to interactivity, early works such as Kaprow's *18 Happenings in Six Parts* also highlight inter-action as an exchange in which the materiality of the work is co-constituted by independent agents.

[16] A fuller analysis of materiality in Kaprow's Happenings will be included in the upcoming publication – Digital Movement: Essays in Motion Technology and Performance. Popat & Salazar.

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