Chapter #: The contested call for 'what works' education research: the Nature of contemporary education research discourses and Grosseteste's views on the anima mundi

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Abstract

The chapter draws parallels between Grosseteste's comments on the anima mundi and contemporary calls for education research to become more evidence informed. The chapter challenges the common interpretation of Grosseteste's commentary on the anima mundi placing it in a wider philosophical debate over the 'nature of Nature'. It is suggested that Grosseteste's reluctance to fully renounce the concept of the anima mundi gives an insight into the contemporary debate within education over the desirability of 'what works' approaches to research. As Nature understood as animated by a 'world soul' is resistant to description through natural scientific methods, so education research should resist 'what works' approaches in favour of a research methodology, informed by complexity theory, that can recognise the animated and emergent nature of Nature.

The contested call for 'what works' education research: the Nature of contemporary education research discourses and Grosseteste's views on the anima mundi

Dr Adam Hounslow-Eyre

This chapter will draw parallels between Robert Grosseteste's nuanced consideration of celestial animation and current debates in education research. It will be argued that the increasingly contested call for education research to become more 'evidence-based' and increasingly able to identify 'what works' at both policy level and in day to day teaching practice can be illuminated by an examination of Grosseteste's consideration of the anima mundi (or 'world soul'). The development of Grosseteste's thinking on the anima mundi can be characterised as the progress towards an un-animated conception of the cosmos (McEvoy, 1986; Dales, 1980) under the weight of patristic theology and anti-Aristotelianism. This perspective will be contrasted with the contemporary controversy over the rise of 'what works' education research, which itself is asserted under the weight of its own 'patrician call' for the methods of natural scientific research to be adopted by education researchers. However, the common characterisation of Grosseteste's thought on the anima mundi will also be challenged, arguing for a more nuanced understanding that will add further insight into both his thinking and contemporary debates within education research. Both Grosseteste's seeming resistance to fully renounce a conception of the cosmos as animated by an anima mundi and the resistance by contemporary education researchers to 'what works' approaches will be characterised as a principled opposition (using Collingwood's term) to the 'disenchantment' of Nature in the name of a 'sophisticated realism'.

The discussion will proceed through four parts; part one details the 'paradigm (or science) wars' that frame contemporary debates within education research over the desirability of more evidence informed approaches; drawing on the work of Alan Bryman. Part two reviews

Grosseteste's comments on the anima mundi making connections to both the paradigm wars and 'what works' approaches to education research. Through Part two it is also argued that the common interpretation of Grosseteste's comments on the anima mundi (ascribed to McEvoy and Dales) can be challenged by a contrasting interpretation drawing on a historical chronology of critical thought from the work of Francis Stevenson, Christina Van Dyke and Jack Cunningham. Part three offers an analysis of historical conceptions of Nature, drawing on the work of Robin Collingwood and Werner Stark to argue that a clear understanding of historical conceptions of the Nature of reality and its 'disenchantment' is essential to enable a critique of 'what works' approaches to educational research that would accord with Grosseteste's nuanced thinking on the anima mundi. Finally, part four brings together the critique of evidence-based approaches to education research with Grosseteste's concept of the anima mundi drawing out how his thinking has contemporary relevance and might highlight future developments in education research drawing on complexity theory.

Part One: The Paradigm (or Science) Wars

The term 'paradigm war' is not easy to delineate, with conflict over which paradigms are involved, the terms used to characterise the warring parties, the start and end dates of the conflict, and indeed if hostilities have ceased (Bryman 2012). As an initial characterisation Bryman (2012) argues that the source of the conflict through the 1980s and 1990s was over the merits and assumptions of quantitative and qualitative research; the type of 'science' that is most 'valuable'. The term paradigm in this context (though again definitions are contested) is a broad concept drawing on the work of Thomas Kuhn (1996), where a paradigm is a set of common assumptions, models and beliefs about how research problems should be understood and addressed. Bryman (2012) offers an insightful overview of the progress and positions implicit in the paradigm wars arguing that they centred on the contrasting 'epistemological' and 'ontological' positions that characterize quantitative and qualitative research.

Epistemology is the branch of philosophical theory that studies what knowledge is and how it is possible. The word 'epistemology' comes from the ancient Greek *episteme*, meaning 'knowledge' and the suffix *olog* meaning 'the science of' or 'the study of.' So, literally speaking, epistemology is the study or investigation of knowledge itself. Epistemological enquiry is not about what we know, but about what it means *to know*. In contrast ontology is the branch of philosophical theory that studies 'being'; what kind of entities exist, the structure(s) of physical reality. The word comes from the ancient Greek *onto*, meaning 'being' or 'that which is'. The possibility of an anima mundi, the debate over whether the cosmos is animated or not might be seen then as an ontological question. Bryman (2012) attempts to further explain the issues at the heart of the paradigm wars by considering the range of positions at both the epistemological and ontological level.

At the epistemological level there is a debate over the desirability of a natural scientific programme for social research, as against one that eschews scientific pretensions and the search for general and universal laws and instead emphasizes humans as engaged in constant interpretation of their environments within specific contexts. For Bryman (2012) this contrast is one that is frequently drawn up in terms of a battle between positivist philosophical principles and interpretivist ones. Bryman continues that at the ontological level, there is a contrast between a belief that there is a social realm waiting to be uncovered by the social researcher which exists externally to actors and on the other hand a domain that is in a continuous process of creation and recreation by its participants. For Bryman (2012) this contrast is often drawn as between objectivist and constructionist accounts of the nature of society.

Figure 1: Diagram showing Bryman's analysis of the paradigm wars at ontological and epistemological levels

Epistemological Level

Interpretivist	**Positivist**
Social Scientific Interpretation of specific contexts	Natural scientific General and universal laws

Constructionist	**Objectivist**
Social realm continuously created and recreated by participants	Social realm akin to physical realm – external to actors

Ontological Level
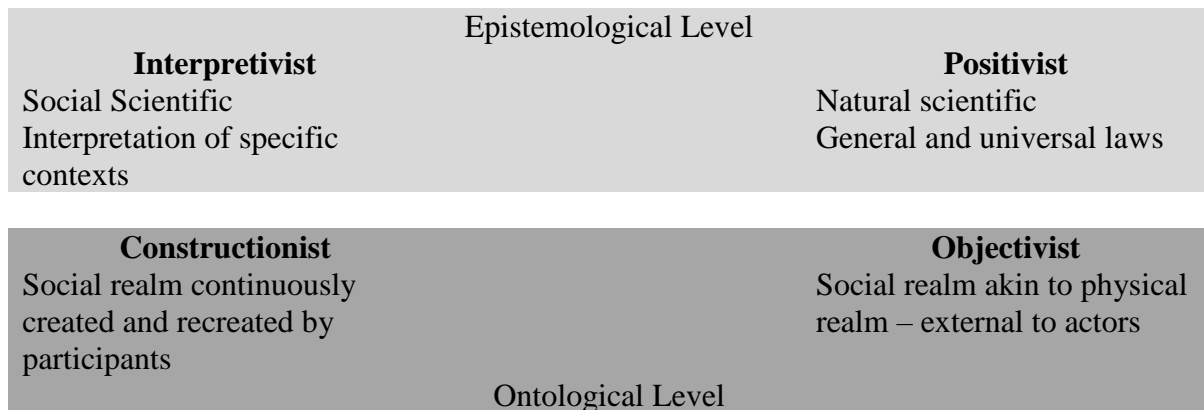
For the discussion through later parts of this chapter it is important to highlight how Bryman's analysis of the paradigm wars permits a concept of 'dynamism' in constructionist ontology and interpretivist epistemology. Constructionist ontology is 'dynamic' (in contrast to objectivist ontology) in that there is continuous creation and recreation of the structures of physical reality by participants. This results in a dynamic interpretivist epistemology (in contrast to positivist epistemology) that is an interpretation of specific contexts that ceaselessly change.

Having set out an initial characterisation of the paradigm wars Bryman (2012) recognises that the debate is deeply philosophical in character and warns that a range of alternative synonyms are used by 'combatants' to characterise what is at the heart of the contest. Bryman also warns that the nomenclature of a 'paradigm' war may be extremely unhelpful, allowing all participants to assume complete incompatibility between their viewpoints. Bryman's insight is perhaps captured most succinctly by Bruce Robbins (1998) assertion that participants in the conflict are marked by their use of "synecdochic rhetoric". Synecdochic rhetoric attempts to

make the part stand for, and condemn, the whole; for instance a theorist in the positivist and objectivist camp will identify an aspect of qualitative social scientific research which they can 'demonstrate' is unsound or misguided and from this dismiss all qualitative research (the 'Sokal hoax', in which physicist Alan Sokal successfully had a spoof article published in a cultural studies journal, can be viewed as an example of this). Bryman (2012) is concerned that rather than assuming a position in one warring camp in the paradigm wars and deploying synecdochic rhetoric to gain victory, a more sophisticated perspective is required. A sophisticated perspective that might allow the warring parties to reach a détente, or perhaps better, allow all parties to move forward ceasing continual skirmishes. The central argument of the current chapter is that such a perspective that can be illuminated by Grosseteste's commentary on the anima mundi.

Paradigm Wars and Contemporary Education Research

The protests of the warring factions in the paradigm wars, with quantitative research typically been associated with a positivist and objectivist stance common to the natural sciences, and qualitative research been associated with an interpretivist and constructionist stance common to the social sciences and humanities, frames much of the debate over the quality and relevance of educational research. A call for a more 'rigorous', 'what works', positivistic and objectivist approach to educational research (exemplified by the practice of the 'gold standard' of Randomised Control Trials) has become widespread and dominant (Furlong 2004, 346).

Calls for education to becomes more evidenced-based have a long history (Hillage Report 1998; Tooley and Darby 1998; Oakley 2006; Slavin 2002). More recently, this call for evidenced-based policy and teaching has centred around data rich practices such as the increasing use of Systematic Review (SR) and Randomised Control Trials (RCTs). Within

educational research the use of SR is exemplified by the meta-analysis of Hattie (2009) and in England by the work of the Education Endowment Foundation which also funds RCTs.

The suggestion that the advocacy of 'what works' education research is 'contested' as in the title of this chapter might seem strange in the contemporary context when, as Yong Zhao argues, 'proponents of RCTs have won the day, at least for now' (2017, 2). The emergence of the 'gold standard' status for RCTs in education research has increasingly suppressed interest (and funding) for more qualitative education research and has been characterised by several thinkers (Millar et al 2002, 29; Lather 2004, 762) as a continuation of the paradigm (or science) wars of the 1980s. Ryohei Matsushita goes further by locating the current emphasis on evidence-based education research in a longer historical and philosophical tradition:

> The clash between the promoters and the critics of evidence-based education can also be said to reflect the clash of academic traditions, from research methodology on. That is, it originates in the classic conflict of *theoria*, which pursues something which will be appropriate at any time or place, and *praxis*, which handles individual situations case-by-case according to differing specific realities: the conflicts of positivism vs. hermeneutics or reductionism vs. holism typically represented by science versus the humanities.
>
> (Matsushita 2017, 105)

As Bryman (2012) suggests it is common for a range of terms to be employed to characterise the warring parties in the paradigm wars. Here Matsushita aligns Bryman's quantitative, positivist and objectivist perspectives with *theoria* and qualitative, interpretivist and constructionist perspectives with *praxis*.

Figure 2: Diagram showing Bryman's analysis of the paradigm wars at ontological and epistemological levels incorporating Matsushita's terminology

	Epistemological Level	
Bryman	**Interpretivist** Social Scientific Interpretation of specific contexts	**Positivist** Natural scientific General and universal laws
Matsushita	**Praxis** Case-by-case according to specific realities – hermeneutics, holism	**Theoria** Appropriate at any time or place – positivism, reductionism
Bryman	**Constructionist** Social realm continuously created and recreated by participants	**Objectivist** Social realm akin to physical realm – external to actors
	Ontological Level	

Matsushita's (2017) setting of the debate over evidence-based approaches to education research in a long philosophical tradition (which he attempts to capture through a variety of binary oppositions) highlights a possible further philosophical opposition with a long history; that between 'realism' and 'nominalism'. *This* opposition is often termed the 'problem of universals' and can be seen as a central concern of both the 'paradigm wars' and the contested call for 'what works' education research. Robert Orton (1995) suggests a universal is any noun (excluding a proper noun) that is used to refer to a number of particular instances of something that shares common characteristics; for instance the noun tiger is a universal used to describe any number of large, striped, sharp-toothed meat eaters that live in China, India, or the zoo (Orton 1995, 212). The problem of universals centres around where the common characteristic of the named phenomenon 'resides'. With great clarity Orton suggests that the history of philosophy is marked by three broad perspectives on where the

commonality of a universal resides; in the world (the realist perspective), in language (the nominalist perspective) or in the mind (the 'conceptualist' perspective) (Orton 1995, 212).

Orton suggests the Platonic 'theory of forms' as an example of a realist perception of universals; in some sense universals exist 'before' (or *ante res*) particular instances of the phenomenon. In contrast to this Aristotelian thought moves away from a realist (in the world) perception of universals to a more nominalist (language based, *in res*) perception of universals. Orton's analysis of the problems of universals is particularly useful as it allows clear links to be made between the paradigm wars (the conflict of *theoria* and *praxis)* and 'what works' education research. The science wars pits *theoria* with a perception of the universal in a realist (*ante res /* in the world) sense against *praxis* with a perception of the universal in a nominalist (*in res /* in language) sense. The outcome of the science wars in Orton's terms was a conceptualist détente, the 'attempt to negotiate a truce between the nominalists and the realists. [Conceptualists] argue, roughly, that a universal term is more than a linguistic convention but less than an independently existing entity or essence.' [*post res*] (Orton 1995, 213).

Figure 3: Diagram showing Bryman's analysis of the paradigm wars incorporating Matsushita and Orton's conceptualization of the problem of universals.

	Epistemological Level		
	Interpretivist	**Positivist**	
Bryman	Social Scientific Interpretation of specific contexts	Natural scientific General and universal laws	
	Praxis	**Theoria**	
Matsushita	Case-by-case according to specific realities – hermeneutics, holism	Appropriate at any time or place – positivism, reductionism	
	Nominalist	**Realist**	**Conceptualist**
Orton	Universals reside in language Aristotle	Universals reside in the world Plato	Universals more than linguistic convention, less than independent entity
	in res	*ante res*	*post res*
	Constructionist	**Objectivist**	
Bryman	Social realm continuously created and recreated by participants	Social realm akin to physical realm – external to actors	
		Ontological Level	

Within education research this conceptualist détente is currently under renewed pressure from the rise of 'what works' approaches which advocate for a more *theoria*, realist (*ante res*) conception of research. This perspective is clearly stated in the work of Ben Goldacre a doctor of medicine and campaigner in unpicking the misuse of science and statistics by journalists and politicians. In his work commissioned by the Department for Education to advocate for the increased use of RCTs in education research Goldacre argues:

> I think there is a huge prize waiting to be claimed by teachers. By collecting better evidence about what works best, and establishing a culture where this evidence is used as a matter of routine, we can improve outcomes for children, and increase professional independence. Every child is different, of course, and every patient is different too; but we are all similar enough that research can help find out which

interventions will work best overall, and which strategies should be tried first, second or third, to help everyone achieve the best outcome.

<div align="right">(Goldacre 2013, 7)</div>

The universalising impetus of *theoria* in the context of 'what works' education research is a 'huge prize' but also the basis of the contestation of the preceding conceptualist détente to the paradigm wars. The day to day *praxis* of educational professionals militates against a view of education research as uncovering evidence which will be appropriate at any time or place; the 'patrician call' to embrace the methods of natural science in education research.

Deborah Osberg, Gert Biesta and Paul Cilliers (2008) are representative of researchers who are both critical of the advocacy of theoria, 'what works' education research and explicitly engage with a consideration of ontology and epistemology. Their thought draws on complexity theory to argue for an 'emergentist epistemology':

> With complexity we suggest that 'knowledge' [epistemology] and 'the world' [ontology] should not be understood as separate systems which somehow have to be brought into alignment with each other, but that they are part of the same evolving complex system.

<div align="right">(Osberg et al 2008, 214)</div>

For Osberg et al (2008) complexity theory 'crucially' introduces a 'notion of time' into the relationship between 'knowledge and reality'. This temporal dimension is the 'dynamic' dimension previously discussed with reference to Bryman's initial characterisation of the paradigm wars and developed through the figures presented above. It is argued that Osberg et al (2008) explicitly draw on the constructionist and interpretivist positions discussed and argue for an emergentist epistemology that recognises praxis in a specific context over time.

> Rather…than thinking of knowledge as the representation of a world that is somewhere present in itself, our considerations suggest an 'emergentist' epistemology in which knowledge reaches us not as something we receive but as a response, which brings forth new worlds because it necessarily adds something (which was not present anywhere before it appeared) to what came before.
>
> (Osberg et al 2008, 226)

It is such contemporary contestation in education research that can be illuminated by an engagement with Grosseteste's comments on the anima mundi (and the 'disenchantment' of Nature). Part two explores and challenges the common characterisation of the progress of Grosseteste's thinking on the anima mundi as towards an un-animated conception; in the terms of this part as a progress from praxis to theoria.

Part Two: Grosseteste and the Anima Mundi

McEvoy (1986) offers a comprehensive overview of Grosseteste's comments on the anima mundi; suggesting that he makes eight references to the concept through his writings. McEvoy goes on to detail a development in Grosseteste's thinking from the notion of a single anima mundi (*De sphaera*) to a plurality of celestial souls (*De motu corporali* and *De motu supercaelesti*) to an eventual rejection of (or silence on) its possibility (*De operationibus solis*). In *De sphaera*, McEvoy tells us that Grosseteste views the anima mundi as the efficient cause of the diurnal motion of the heavens, as an agent that brings a thing into being or initiates a change; comparable to the efficient cause of a table being a carpenter. The movement of the planets is effected by the operation of the anima mundi; this concept is perhaps dangerously 'enchanted' in relation to Aquinas' view of God as a first, efficient cause.

For McEvoy, Grosseteste's conception of the anima mundi develops by the time of *De motu corporali* and *De motu supercaelesti* where his view is now more analogous to a Platonic

notion of a 'moving soul' or the Aristotelian conception of an 'unmoved mover', with the heavenly bodies being animate but not sensate. (In the terms of part three the cosmos, Nature is increasingly seen as disenchanted and mechanical). McEvoy suggests that by the time of *Exiit edictum* Grosseteste's views have developed still further with the hypothesis of the anima mundi being deliberately wide, to include the speculations of Plato, Aristotle and Avicenna; but also more speculative with the assertion that the heavens may be animate 'as certain philosophers maintain'. By the writing *De operationibus solis* Grosseteste's acknowledgement of the speculative nature of the anima mundi is more complete where 'beyond subjunctives he [Grosseteste] is not prepared to go' (McEvoy, 1986 376). As McEvoy highlights, Grosseteste more moderately claims that 'certain philosophers' postulate a living principle of heavenly motion; a claim that he no longer expresses to hold himself. For McEvoy, Grosseteste's flirtation with the anima mundi is finally at an end by the time of *Hexaemeron* where he acknowledges that there is no scriptural support for the animation hypothesis.

However, the movement of Grosseteste's thinking to a rejection of the anima mundi might be characterised as less complete than McEvoy asserts, as Grosseteste writes:

> Since on this subject of the nature of the heavens, and of the movers of the heavens, and of the moving powers they have, so many philosophers and authorities have given so many and such uncertain opinions, what can I do except admit and bewail my own ignorance on the point?
>
> Chapter VIII
>
> 1. I am not ashamed to admit my ignorance about the number of the heavens, and about their movements, even though I could tell you a large number of views from the astronomers as well as from the natural philosophers. I do not know how to show up any of them as liars, or show them forth as telling the truth, since they have left us nothing but ambiguity.
>
> (*Hexaemeron*, Part 3, Chapters VII – VIII (Martin 1996 translation))

Grosseteste's 'ignorance' on this point might be regarded as more significant than McEvoy's interpretation gives credit. Francis Seymour Stevenson's (1899) interpretation of Grosseteste's thought as 'sophisticated realism' can be fruitfully utilised to further explore this ambiguity over the anima mundi in the context of the wider realist and nominalist debate.

Stevenson suggests that Grosseteste's contribution to the 'debate over Universals' might be regarded as a 'sophisticated realist' position which views Universals as simultaneously '*ante res*', '*in res*' and '*post res*' 'according to the point of view' (Stevenson 1899, 42). In Stevenson's interpretation of Grosseteste, Universals are '*ante res* in the mind of the Creator, expressed '*in res*' in the phenomenal world and reconstructed '*post res*' in the mind of the thinker by induction and abstraction. This interpretation of Grosseteste's thought on the problem of Universals gives an insight as to why he may have been unwilling to completely renounce the anima mundi. This description of epistemology is 'vital' (living and animate) and 'dynamic'; in the context of the paradigm wars it is a position closer to a qualitative and interpretivist epistemology drawing from a constructionist ontology. There is a sense of *praxis* at the heart of Grosseteste's thinking. Stevenson's interpretation suggests Grosseteste's engagement with Aristotelian nominalism results in a sophisticated epistemological position that is trying to unify nominalism with the realist sense of Augustinian 'divine illumination' which itself draws on the Platonic theory of forms. A similar argument has been proposed more recently in the work of Van Dyke.

Van Dyke (2009) argues that scholarship on Grosseteste's opinions concerning Augustinian illumination and Aristotelian nominalist epistemology in the *Commentary on the Posterior Analytics* tends to fall into two distinct camps; with one camp (exemplified for Van Dyke by McEvoy) arguing that Grosseteste does not hold the Aristotelian account on which he

comments, while the other camp (exemplified for Van Dyke by Marrone) argues that Grosseteste's exposure to the *Posterior Analytics* leads him to abandon completely a theory of divine illumination. However, for Van Dyke:

> I believe, in contrast, that Grosseteste quite consciously attempts to embed the 'new' epistemology of the Posterior Analytics within an account of divine illumination, and that he himself thought he had successfully reconciled the Augustinian and Aristotelian views.'
>
> (Van Dyke 2009, 686)

Or in Stevenson's terms:

> [Grosseteste's] influence was distinctly on the side of Realism as against Nominalism; but it was a realism which differed widely from the crude system of thought with which William de Champeaux had been identified, and which ascribed to universal notions an 'objective reality'.
>
> (Stevenson 1899, 42)

Cunningham (2018) adds further weight to the suggestion that the common characterisation of the progress of Grosseteste's thought on the anima mundi should not be revised. He interprets the development in Grosseteste's thinking not as 'growing orthodoxy and final capitulation to Catholic consensus' (Cunningham 2018, 81) but rather the product of an original, searching mind and suggests that there are two aspects to the increasing aversion to the anima mundi in Christian theological discussion more broadly. The first was that a conception of a living cosmos would lead to an idolatrous assertion of

its divinity. Secondly, the suggestion of God indwelling in the universe undermined the growing Christian understanding of a creator who transcended the natural order. In this context, Grosseteste's resistance to completely abandoning the concept of the anima mundi is even more striking. In the terms of contemporary debate within education research it is possible to see some researchers with similarly searching minds willing to commit the idolatry of eschewing the pretentions of natural science by insisting on a more animated, emergent and sophisticated realist conception of education research.

To be more precise, utilising the discussion from part one, Grosseteste can be interpreted as offering a solution to the problem of Universals that accords with Orton's conceptualist account. This conceptualist account entails a vital and dynamic sense of ontology, an ontology of an animated cosmos and an anima mundi. In terms of education research there is currently debate between a 'what works' approach that offers a 'crude system' (to use Stevenson's term) of positivistic, theoria realism opposed by a more interpretivist and conceptualist account that might seek inspiration from Grosseteste's comments on the anima mundi.

The significance of this animated ontology, that resists the disenchantment of Nature, is explored at length through the next part.

**Part Three: Nature and its Disenchantment**

This part revisits and extends discussion of the philosophical underpinnings of epistemological and ontological positions mentioned above in respect to the paradigm wars (part one). A very broad framework of analysis will be developed and advocated for to explore the significance of Grosseteste's thought on the animated cosmos for contemporary education research.

This broad framework draws on the work of Collingwood and Stark. The notion of the 'epistemic fallacy', from Roy Bhaskar, is used as a bridge from the preceding discussion of the ontological and epistemological positions implicit in the paradigm wars to contemporary debates over 'what works' approaches to education research.

Bhaskar is widely cited as the founder of the 'critical realist' methodology (Bhaskar and Hartwig 2010). A central concept is Bhaskar's claim of an 'epistemic fallacy' (1997). Bhaskar states the epistemic fallacy as the erroneous belief that questions of ontology are reducible to questions of epistemology. Bhaskar asserts there is no escaping a theory of ontology; a theory of knowledge (epistemology) must have a presupposition about what the world is like (ontology) (Spencer 2000). In beginning to develop a framework Bhaskar's epistemic fallacy is presented thus:

Figure 4: Diagram representing Bhaskar's epistemic fallacy

$$\frac{\text{epistemology}}{\text{ontology}}$$
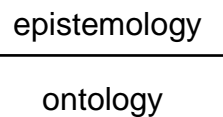
This representation is intended to both make connections to the figures presented in part one and to highlight how a prioritisation of epistemology can lead to a smothering, or inattention to underlying ontology. This inattention, it is suggested, is a facet of current calls for education research to embrace 'what works', data rich practices.

It is possible to give Bhaskar's somewhat abstract statement of the epistemic fallacy more substance (and develop the framework advocated here) by considering a 'history of ideas' of what epistemological and ontological viewpoints have emerged over time in Western thought. The work of Collingwood offers such a conceptual overview that can illuminate the thrust of Bhaskar's fallacy.

Collingwood is most famous for his posthumously published book *The Idea of History* (1946). Through *The Idea of History* Collingwood delineates a 'tripartite' division of history into the potentially uncontroversial categories of ancient, medieval and modern. Collingwood then suggests that each epoch of history had a different epistemology (or theory of knowledge) which he labels magic, religion and science. These epistemologies do not neatly match (begin and end) with each historical category; indeed an epistemology does not really come to an end, the progress of history is marked by increasingly complex interactions between rival epistemologies. As an epistemology of magic is superseded by the emergence of religion, human individuals do not all simultaneously renounce their magic beliefs; now there are at least two approaches to knowledge claims; a magical *or* a religious epistemology (or a combination of the two).

To use the analogy of a map, there are now two alternative ways to 'get around'; at least two ways to answer the epistemological question 'what is knowledge and how is it possible?' Both epistemologies make reference to significant (ontological) features and sources of evidence to 'anchor' their claims to truth. To continue the analogy, as 'a map is not the territory'; so magic and religion are epistemology (differing maps) and not ontology (the territory it attempts to represent), the study of 'what kinds of things exist'. In a later work Collingwood moves on to address the differing ontological assumptions that underlie the epistemological positions he has identified in Western thought.

Through another posthumous work *The Idea of Nature* (1945) Collingwood turns his attention to historical conceptions of, or metaphors for, Nature with a capital 'N'. It is important to notice this capitalization. Collinwood suggests the noun 'nature' has two common meanings, the first sense is of the essence or the inherent features, character, or qualities of something (it is in the nature of cats to chase birds). The second sense is of the phenomena of the physical world collectively, including plants, animals, the landscape, other

features and products of the earth, as opposed to human creations. Collingwood's enquiry through the *Idea of Nature* is to delineate the 'nature of nature' (the essence of nature in the second sense above) thus 'the idea of <u>N</u>ature'. These he terms the ancient Greek view of 'Nature as Organism', the Renaissance view of 'Nature as Machine' and what he argues for as the Modern view of 'Nature as History'. It is then, possible to develop the diagram of Bhaskar's epistemic fallacy (above) through Collingwood's work thus:

Figure 5: Diagram representing Bhaskar's epistemic fallacy developed by reference to the work of Collingwood

Bhaskar		Collingwood		
	historical epoch =	ancient	medieval	modern
epistemology	epistemology =	magic	religion	science
ontology	ontology = <u>N</u>ature as …	Organism	Machine	History

Again, Collingwood is not suggesting that these ontological metaphors of Nature neatly coincide with epistemological or historical epochs, but he is rather exploring the nuanced interaction between such ontological and epistemological positions. As a simple example, a mechanistic ontology of Nature (Nature as Machine) can be seen to increasingly dominate into the modern period, 'transposing' earlier organismic views until the role of God becomes that of a 'divine watchmaker' (commonly termed the 'argument from design'). Under the

further pressure of epistemological developments into the era of modern science the mechanistic metaphor of Nature as a divinely created machine (the 'watch of God') comes instead to be viewed as a regular, predictable 'machine' subject to universal laws (the Newtonian 'billiard ball universe'). The sense of Nature as Machine becomes literally 'disenchanted', there is no place for the divine or spirit (an anima mundi) as the machine becomes increasingly knowable by and subject to the operation of human, scientific reason; the universal and general laws of theoria come to be the dominant epistemological outlook. The conception of a machine that animates this ontology of Nature as Machine itself changes over time as humans invent and experience different machines: clocks, steam engines, internal combustion engines and computers.

To return to the framework above, in explaining his advocacy of 'Nature as History', Collingwood agues at the end of *The Idea of Nature*:

> I conclude that natural science as a form of thought exists and always has existed in a context of history, and depends upon historical thought for its existence. From this I venture to infer that no one can understand natural science unless [they] understands history; and no one can answer the question what Nature is unless [they] know what history is....that is why I answer the question, 'Where do we go from here?' by saying, 'We go from the idea of Nature to the idea of history.'
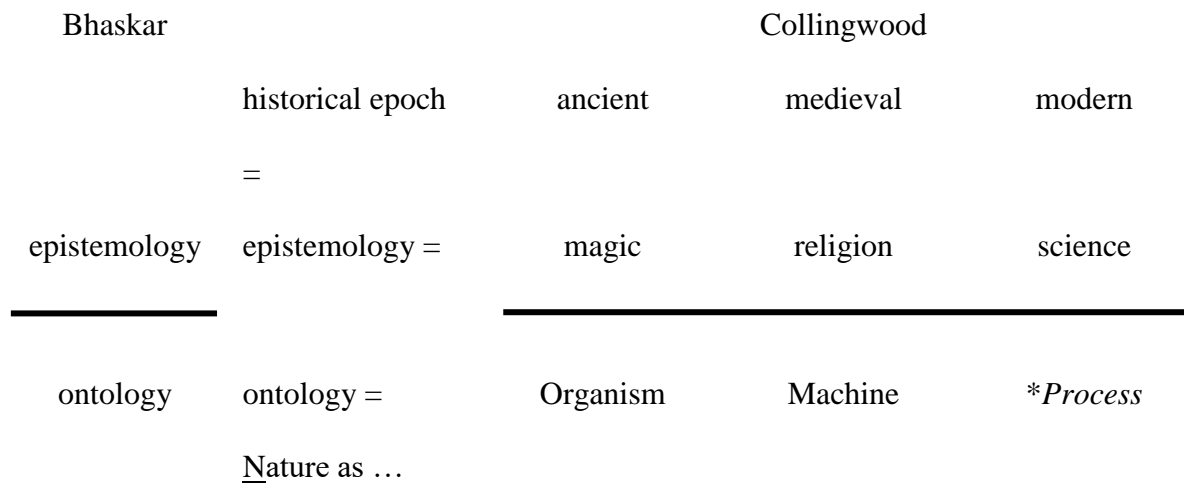>
> (Collingwood 1978, 177).

It is perhaps unsurprising that an Oxford historian should have a high regard for History, however Collingwood's intent here is significant. He is signalling an 'ontological paradigm shift'; he is challenging the paradigm of Nature as Machine and the positivistic notion of nature itself. *The Idea of Nature* concludes with Collingwood asserting that we need to give up positivistic conceptions of ontology and move to a more temporal (changing over time,

dynamic and emergent) conception; a more interpretivist informed position that can issue in a conceptualist inspired more sophisticated realism.

What is clear is that Collinwood is suggesting that the ontological metaphor of Nature as Machine is being superseded. While he terms the change in metaphor as the emergence of Nature as History (incorporating a rejection of positivism), it is also a call to recognise 'process' and the dynamic nature of reality. Collingwood seems to be arguing that historical understanding is unlikely to be 'born' from 'empirical hypotheses' but requires an ongoing process and ontological engagement. This sense of process is of some utility as 'Nature as Process' contrasts with 'Nature as Machine' capturing something of the intellectual movements that precipitated the change. For instance, the impact of the concept of evolution drove Western thought from a view of Nature as fixed (with God as watchmaker perhaps) to a sense of a dynamic *ecosystem*, possessing reflexivity (or feedback processes characteristic of complexity theory and emergence) that ultimately influence and forge the nature of Nature through adaptation and survival of the fittest. This is perhaps a moment of re-enchantment, with the metaphor of Nature shifting from a lifeless (disenchanted) Machine to a 'vital', living, reflexive process; the reawakening of a more animate and emergent metaphor for Nature. Thus an amendment of Collingwood's terminology is suggested:

Figure 6: Diagram representing Bhaskar's epistemic fallacy developed by an amended reference to the work of Collingwood

Bhaskar		Collingwood		
	historical epoch =	ancient	medieval	modern
epistemology	epistemology =	magic	religion	science
ontology	ontology = Nature as …	Organism	Machine	*Process*

* and italics marks amendment

It is striking that Stark, through *The Fundamental Forms of Social Thought* (1962), argues for a similar historical development to that of Collingwood in his discussion of sociological perspectives on conceptions of the 'nature of society'. Stark argues that views of society have progressed through what he terms a 'deductive phase' which focussed on opposing 'unity' and 'multiplicity' views of social formations (the problem of Universals interpreted through a sociological lens). It is Stark's argument that collectivist, holistic and unitary views of society, that view social formations in a realist (*ante res*) sense have given way to atomistic, individualistic and multiplicity views of society, that view social formations in a nominalist (*post res*) sense. For Stark, realism and nominalism are sound, if one sided, philosophies. His task through *The Fundamental Forms of Social Thought* is not to decide between them but to reconcile the two; this is achieved by 'winning' a third mediating approach which sees

society more dynamically than either parent theory. In detailing this mediating approach, which Stark characterises as the 'inductive phase' of his thinking, he is inspired by the work of Dilthey. For Stark, Dilthey's genius is his identification of three fundamental forms of thought which Dilthey terms 'objective idealism', 'naturalism' and 'subjective idealism'. Stark extends Dilthey's thought and in doing so renames the fundamental forms Organicism, Mechanicism and Process respectively. It is hoped that the kinship to Collingwood's position is clear, with the final term at the ontological level being variously represented as history (Collingwood), subjective idealism (Dilthey) or process (Stark).

For each fundamental form of thought Stark develops a detailed overview considering representative figures along a spectrum of 'purity' within each form. To offer a brief flavour of Stark's thinking it is useful to briefly consider the 'golden key' and 'key discipline' that Stark proposes for each of the three forms. For the organic form of thought, the golden key is acquaintance with living organisms comprised of a material body and spiritual soul; this issues in pantheistic (and it might be asserted here *in res*, enchanted) views of society with biology as the key discipline. For the mechanistic form of thought, the golden key is acquaintance with inanimate and regular laws of physics; this issues in materialistic (*ante res* and disenchanted) views of society with physics as the key discipline. For the process form of thought, the golden key is acquaintance with moral conflict; this issues in a (*post res*) personalistic theistic view of society with history as the key discipline. The 'winning' of this mediating approach as a personalistic and processual 'fundamental form' of social thought might be illuminated by returning to Collingwood.

Near the end of *The Idea of Nature* Collingwood characterises the break from preceding mechanistic ontological thought as the fading of the idea of 'Nature at an instant,' utilising a quotation from the work of Whitehead:

The older point of view [Nature as a machine] enables us to abstract from change and to conceive of the full reality of *Nature at an instant*, in abstraction from any temporal duration and characterised as to its interrelations solely by the instantaneous distribution of matter in space......For the modern view process, activity and change are the matter of fact. At an instant there is nothing. Each instant is only a way of grouping matters of fact. Thus, since there are no instants, conceived as simple primary entities, there is no Nature at an instant. (*Nature and Life* 1934, 47-8.)

(Whitehead as cited in Collingwood 1978, 149)

Collingwood is commenting on the fading of the grand narrative of Newtonian natural science. In the Newtonian paradigm, armed with the increased amassing of scientific theory (scientific epistemology) supported by an ontology of Nature as a Machine (subject to universal, regular, predictable laws) it was possible in principle, to attain a God like overview of reality; to have Nature at an instant. If the ontological metaphor of Nature as Machine is correct, then it is in principle possible to accurately predict all future states of Nature by the simple application of scientific laws. It is just this Newtonian faith in the 'billiard ball' universe that is challenged by the sense of Nature as Process. The Newtonian paradigm contains a mechanistically informed 'standard operating procedure' for rigorous scientific study. To understand reality conceived as Nature as Machine it is quite feasible to metaphorically stop the machine, disassemble it and examine its individual parts. However, this Newtonian paradigm has been superseded by the 'winning' of a different ontological viewpoint, a conceptualist view of Nature as History or Process. From this ontological perspective it is impossible to 'stop the watch' and examine the 'Nature Machine', Nature is inherently dynamic and intimately linked to its environment; it is inescapably animate. Nature as Process, like an ecosystem, is influenced by changes and feedback from within the system; increasingly Nature is viewed as possessing emergent properties.

In education research the 'nature at an instant' thinking that is implicit in calls for 'what works', data rich research based on the increased use of SR and RCTs is perhaps best captured by Malaguzzi's hostility to what he terms 'prophetic pedagogy'. Loris Malaguzzi the founder of the Reggio Emilia approach to education, began his teacher training in the immediate aftermath of the Second World War in Italy, initiating a grassroots approach to schooling - 'people's schools' - that was suspicious of massed, centralised approaches to education. His war time experiences made him hostile to prophetic pedagogy which

> .. knows everything beforehand, knows everything that will happen, knows everything, does not have one uncertainty, is absolutely imperturbable. It contemplates everything and prophesies everything, sees everything, sees everything to the point that it is capable of giving you recipes for little bits of actions, minute by minute, hour by hour, objective by objective, five minutes by five minutes. This is something so coarse, so cowardly, so humiliating of teachers' ingenuity, a complete humiliation for children's ingenuity and potential.

(Cagliari et al 2016, 98.92)

Collingwood's rejection of 'nature at an instant' is (in Bryman's terms) the eschewing of the pretentions of natural science to discover the theoria of universal and general laws in both the natural and social sciences. Collingwood urges a rejection of 'nature at an instant' thinking based on a detailed engagement with the epistemological and ontological views that must be presumed to support such an outlook, the epistemology of natural sciences that draws on a realist and increasingly disenchanted view of Nature as Machine. In its place Collingwood argues for what he terms a more 'historical' ontology, in the terms of this chapter for Nature as Process. This ontological outlook is more amenable to a constructivist and nominalist conception of Nature, with knowledge making inescapably being interpretivist praxis, a process of continual creation in specific contexts. While Collingwood might be seen as

another combatant in the paradigm wars deploying synecdochic rhetoric (perhaps of a deeply considered philosophical variety) to the interpretivist and constructivist cause, his broad framework of analysis does facilitate a clearer consideration of Grosseteste's comments on the anima mundi, understood in the more nuanced, conceptualist and emergent sense argued for in parts one and two, and the contemporary debate within education research.

Part Four: Grosseteste's sophisticated realism and future directions for contemporary education research

Calls for contemporary education research to be more evidenced-based, and such research to discover 'what works' are contested. The current controversies can be placed in the context of the preceding paradigm wars in research. Though the characterisation of these debates as a paradigm war can be unhelpful, allowing 'combatants' to engage in synecdochic rhetoric, it is useful as a framework of analysis as it allows contemporary discourse in education research to be informed by broader philosophical debates such as that between theoria and praxis, the problem of universals and the disenchantment of Nature. Having a greater understanding of the ontological issues at stake makes it possible to attempt to move the contemporary discourse forward by reference to historical discussions, and suggested solutions to these perennial concerns. Grosseteste's comments on the anima mundi, understood in a more nuanced way than an eventual rejection of cosmological animation is particularly useful in this regard.

Both Grosseteste and some contemporary education researchers (such as Osberg and Biesta (2008, 2010)) seem unwilling to renounce a concept of Nature as Process; of Nature and research as vital, dynamic, emergent and particularist as opposed to being disenchanted, mechanistic and universalistic. The commitment is to the complexity of post res,

conceptualist research rather than the chimera offered by 'what works' approaches of ante res, prophetic education research.

If Stevenson's, Van Dyke's and Cunningham's interpretations of Grosseteste's thought are accurate his unwillingness to decisively reject an anima mundi offers a route to develop contemporary discourse in education research. Grosseteste's final bemoaning of his ignorance over the anima mundi chimes with those researchers and practitioners who are uneasy in taking up a more universalistic (theoria) approach to education research to inform their research focus or day-to-day classroom practice (praxis). Such a position can be subjected to synecdochic rhetoric from a positivistic and objectivist position

> I argue that current resistance to RCTs in education research cannot be explained according to a rational model […] the 'resistors' have simply not attended to the evidence that RCTs are practical, feasible, ethical and useful in yielding information to guide those who design, provide and use education services. The reasons for resistance can be understood in sociological terms, as conservative responses to real or imagined threats, including that of 'new' technology and its ability to reveal previously concealed features of academic work. Such responses can also be seen as moves to assert ideological positions and confirm academic status.
>
> (Oakley 2006, 64)

Education research that eschews the scientific pretension and search for general and universal laws is not 'relativistic' but rather a sophisticated realism. A sophisticated realism that is committed to engage with knowledge *in res*, *post res* and *ante res*. There are attempts by some theorists of education research to apply an ontology of Nature as Process to the debate. For Biesta and Osberg this sense of Nature as Process is bound up with complexity theory and its 'crucial' temporal dimension:

> Many educationalists have found complexity theory helpful for describing, characterising and understanding the dynamics of education differently, not in the least because the language of complexity makes it possible to see the non-linear, unpredictable and generative character of educational processes and practices in a positive light, focusing on the emergence of meaning, knowledge, understanding, the world and the self in and through education.

<div align="right">(Biesta and Osberg 2010, 2)</div>

This then might be what an engagement with Grosseteste's thinking contributes to the debate within education research, a more sophisticated realism than that offered by advocates of a 'what works' research project; a research route that seems condemned by the terms of the discussion here, to be advocating capturing Nature at an instant through a surreptitious appeal to an outdated ontology of Nature as a Machine, when '[f]or the modern view process, activity and change are the matter of fact'. What is in fact required is an ontology of Nature as Process allied to an emergentist epistemology; knowledge that emerges dynamically in a conceptualist fashion; simultaneously *in res, ante res* and *post res*.

Within current education policy making and research, the framework and discussion offered here should raise some concerns amongst the advocates of a 'what works' approach. The intention is not to add more synecdochic rhetoric to the debate (a 'what works' methodology of RCTs increasingly bolstered by SR can unquestionably reveal important insights), however such an approach will necessarily always have very limited predictive power, as 'nature at an instant' is 'overtaking' by the emergent praxis of lived reality. This statement is not a 'resistance to new technologies' (Oakley 2006) but rather a rigorously scientific position. Those sceptical of the calls to adopt rigorously scientific approaches to educational research are justified in their scepticism when the calls are made by fellow researchers who either unreflexively commit the epistemic fallacy of ignoring ontology altogether (renaming Nature at an instant as 'what works'), or make surreptitious or unconscious appeal to an

ontology of Nature as Machine to interpret their findings as objective and scalable (applicable to all situations). Some of these concerns are voiced by researchers in the field, most notably Biesta (2007), Hammersley (2005), Higgins (2014) and Wiliams (2016) who question the increasing dominance of cognitivist informed research advocated by a recent education secretary (Gove 2014).

It is the *ante res* presumptions of prophetic pedagogy and 'what works' education research that an engagement with Grosseteste's comments on the anima mundi can illuminate, lighting a path towards a more sophisticated and emergentist alternative.

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