

**Intelligent Design:
Scientific and Theological Perspectives**

**Submitted by Andrew Mark Sibley to the University of Exeter
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Abstract:

This thesis examines the claims of the recently formulated Intelligent Design arguments, particularly in relation to the work of Michael Behe and William Dembski, and considers whether they are acceptable as good science and as good theology. I respond to scientific considerations mainly at the level of the philosophy of science, particularly from David Hume and related commentators such as John Mackie and Elliott Sober. Theological aspects are considered in light of Reformed Calvinism with influence coming from Augustine and Paul. Interestingly, it is also evident that there is an Augustinian influence in the philosophy of science and I will highlight some of this in this thesis, especially with regard to the work of Alvin Plantinga and Michel Polanyi. In chapter two I look at Hume's *Dialogues Concerning Natural Religion* and identify various objections raised, for instance by Mackie. In this chapter I then consider the claim that the design argument can only be a weak or remote analogy to human intelligence and offer two ways forward. In chapter three I look more broadly at claims by Michael Ruse that Intelligent Design cannot be good science because it doesn't follow the rules of methodological naturalism. In response, I consider Plantinga's claim that Christians can move to Augustinian science and do not need to hold to naturalistic methodology in science. I also consider the thinking of Paul Feyerabend relating to criticism of methodological monism in science because it restricts scientific discovery. I also discuss concerns raised by Imre Lakatos because he believes a degree of dogmatism is necessary in science in order to hold to objective truth and avoid relativism. I then offer some thoughts as to what an Intelligent Design research programme might look like. In the fourth chapter I look at theological aspects of Intelligent Design. I discuss the question of whether it is possible to search for evidence for design apart from revelation and divine grace, and discuss difficulties highlighted by a number of theologians. I then consider the divine action debate in relation to Intelligent Design, and in the final part of the theology chapter examine question of theodicy that arise for Intelligent Design, again in light of Calvinism with its Augustinian-Pauline influence.

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1. Introduction

1.1. What is Intelligent Design?

1.1.1. Defining Intelligent Design

In this thesis I am going to examine the claims of the recently formulated Intelligent Design arguments and consider whether they are acceptable as good science and as good theology. However, there are firstly two points to note. Due to lack of space it will not be possible to engage in detailed scientific arguments so I will respond to scientific considerations mainly at the level of the philosophy of science. And in terms of what constitutes good theology, for this present study I will consider this to be encapsulated by Reformed Calvinism with its Augustinian-Pauline influence.¹ Interestingly, it is also evident that there is an Augustinian influence in the philosophy of science, and I will highlight some of this in this thesis.

The main proponents of Intelligent Design are those associated with the Discovery Institute based in Seattle in America,² although in this thesis I am going to be concerned mainly with the work of Michael Behe and William Dembski who have provided a central core of ideas that are representative of the arguments (Behe, 1996; 2003: 277-291; 2004: 352-370; 2007; Dembski, 1999; 2004; 2005; 2007). So what is Intelligent Design? Behe defines it as a scientific theory that investigates the ‘*purposeful arrangement of parts*’ although he sees it as being focussed upon the complex biochemical structures that have been discovered by modern biology (Behe, 1996: 193). Dembski writes that Intelligent Design is ‘...a theory of biological origins and development,’ and further comments that foundationally it is the claim that ‘intelligent causes are necessary to explain the complex, information-rich structures of biology and that these causes are empirically detectable’ (Dembski, 1999: 106); also that there are ‘events, objects and structures’ in the world that ‘exhaust the explanatory resources of undirected natural causes’ (Dembski, 1999: 107). There is though a tension here, that on the one hand Behe seems concerned with giving explanations for physical structures, while on the other Dembski sees it more in terms of information theory and the desire to

¹ As B.B.Warfield noted, the Reformation was ‘...the triumph of Augustine’s doctrine of grace over Augustine’s doctrine of the Church’ (Warfield, 1956: 321-322) Quoted by Peter Harrison (2007: 52).

² Although often considered a right wing organisation, it in fact funds some progressive ideas such as novel forms of transportation. It has though also produced the infamous ‘Wedge Document’ as a plan to surreptitiously bring Intelligent Design into American society (Forrest, 2001: 5-53).

search for intelligent explanations as opposed to physical explanations. I will discuss this in further depth in chapter four, but I am going to accept from the start that Intelligent Design includes both claims about physical action and intelligent agency, thus potentially encompassing both the scientific and theological arenas. (As a note of clarification, when referring to the position of Behe and Dembski in this thesis, that design in nature is empirically detectable, I will use the capitalised form Intelligent Design, but at times when speaking about a more general belief in design I will use the non-capitalised form intelligent design).

Intelligent Design proponents seek to use inferential reasoning and scientific tools to reach a firmer conclusion of design in biological structures. Presently, there are two main claims in support of Intelligent Design, firstly is Behe's *irreducible complexity* that has been developed as a qualitative concept (Behe, 1996), and secondly is Dembski's *specified complexity* that has been developed as a mathematical tool in an attempt to quantify complexity (Dembski, 2004). For Behe, irreducible complexity is defined as

...a single system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning (Behe, 1996: 39).

If true, this would entail that the organisational complexity of at least some biological structures must have arisen all at once instead of through an evolutionary pathway, and for this reason Behe's claim has been seen as a form of creationism by most modern Darwinists. The above definition of irreducible complexity has also been criticised by evolutionists such as Kenneth Miller and by Russell Doolittle (Doolittle, 1993: 24-28; 1997: 28-29, Miller, 2004: 81-97), mainly because they believe parts of various biological systems may have other uses in the cell. Behe does though vigorously defend his work (Behe, 2007). Dembski's specified approach is to argue that it can be shown mathematically that evolutionary explanations are incomplete within the framework of naturalism, if working only with regularity and chance. In his book *The Design Inference* Dembski argues that there is a universal probability bound (that is a limit to probabilistic resources in the universe that is at the level of 1 in 10^{150}) and that design can be determined through an explanatory filter (Dembski, 2004). While I think the

details of his explanatory filter can be challenged, Dembski is not the first to argue that such a limit to chance in a finite universe exists, as I will discuss below.

1.1.2. A Renewed Interest in Design

There is a general belief within the scientific community today that either Charles Darwin or David Hume, or both, have effectively shown the design argument to be mistaken. Although some modern philosophers of science, such as John Mackie believed that Hume was instrumental in removing the design argument from its place (Mackie, 1982), others such as Richard Dawkins believe that Charles Darwin's book *On the Origin of Species* had a more profound impact. Dawkins for instance writes that, for him, it was Darwin who 'made it possible to be an intellectually fulfilled atheist.' (Dawkins, 1986: 6). From the time of Darwin to the present day there have been a number of organisations that have attempted to maintain a commitment to design through forms of creationism, but these have seemingly been fighting a losing battle with Darwinism having a commanding position in secular institutions. However, the design argument has gained some renewed strength in recent years.

Against the historical backdrop of strong support for neo-Darwinian evolution in the twentieth century we may ask what the reasons are for an apparent renewed interest in the design argument in the latter part of the last century? I believe there are essentially two main reasons that come out of developments in science. The first reason was the final abandonment of the Steady State theory of cosmology that Sir Fred Hoyle had championed for many years. Instead he came to accept the Big Bang Theory of the origin of the universe, which he thought placed limits upon the probabilistic resources of the universe in terms of time, space and chance. Within this Big Bang paradigm the Epicurean arguments expounded by Hume are weakened. Hume, through his character Philo, had argued that falling atoms could organise themselves into all shapes within an infinitely old universe (Hume, 1947: 182), but cosmologists generally consider now that the observable universe is bounded in terms of both time and space, even though still believed to be of the order of 10-15 billion years old (or around 10^{18} seconds). But while the probabilistic resources available in the observable universe have decreased because of Big Bang cosmology, knowledge of the complexity of life at the level of microbiology has increased.

So, the increase in our understanding of the complexity of life at the cellular level together with the discovery of the genetic code is, I would argue, the second reason for renewed interest in the design argument. With the unravelling of protein sequences and the genetic code in the middle and latter part of the twentieth century, the mathematical quantification of biological complexity at the cellular level has become the goal of some scientists. This has led to various attempts to come to terms with the mathematical complexity found within the cell, and Marcel Paul Schützenberger for instance believed that such attempts at quantification were entirely appropriate for science (Schützenberger, 1996). However, most biologists have tried to hold these developments within a Darwinian paradigm, and a symposium was held at the Wistar Institute in Philadelphia in 1966 to consider the ‘Mathematical challenges to the neo-Darwinian Interpretation of Evolution’ with Chairman Sir Peter Medawar (Medawar, 1967). Among contributors were Murray Eden (1967: 5-12), and Schützenberger (1967: 73-75). Eden for instance pointed out that in five billion years it was extremely unlikely that the necessary genes for *Escherichia coli* could have evolved within a two centimetre thick layer covering the entire surface of the earth (Eden, 1967: 5-12). Such conclusions led to heated debate, but with a general denial that there was a desire to abandon evolution and embrace forms of creationism.

This did though lead to further considerations. One was a belief that perhaps evolution took place in space and that life on earth had been seeded through something like panspermia; the other was the reawakening of the possibility of design amongst some others. Hoyle and Wickramasinghe considered the chance of getting the two thousand necessary proteins together to form even the smallest possible biological organism.³ They considered that if each protein is assigned a relatively high probability of 10^{-20} , then the overall chance of finding the correct proteins in the right place at the same time is equal to one chance in $10^{40,000}$. Hoyle and Wickramasinghe considered this unworkable even if the whole universe were full of organic soup (Hoyle and Wickramasinghe, 1981: 24). As noted one consideration was that panspermia might be a possibility, although the one time atheist Hoyle later developed religious leanings becoming a vague deist, as did the one time atheist Antony Flew who was later also persuaded by the mathematical complexity of bio-molecular chemistry (Flew and Varghese, 2007), and Michael Denton also expressed some sympathy for design in his

³ Proteins exist as strings of amino acids, typically 10s or 100s of amino acids long, with approximately 20 different types of amino acids available in the cell.

book *Evolution: A Theory in Crisis* (Denton, 1986). In terms of ‘seeding’ from space, Francis Crick had in fact proposed directed panspermia as a possibility in the early 1970s (Sagan, 1973: 54), reiterating this as a possibility in 1981 by commenting that the origin of life appears to be ‘almost a miracle’ (Crick, 1981: 88). The apparent need for further expansion of the probabilistic resources available in the universe has though seen the development of various multi-verse hypotheses. However, it ought to be noted that these are in effect metaphysical ideas rather than scientific arguments because they extend science beyond what is directly observable. In other words, these considerations take the argument into the metaphysical arena, an arena that is arguably also occupied by Intelligent Design.

An alternative response to the development of the science of genetics that avoids the design argument is one that plays down the significance of such mathematical arguments. Denis Alexander has responded that there is such a thing as ‘the fallacy of large numbers’ and believes that protein structures arise incrementally and not all at once (Spencer and Alexander, 2009: 42). He further argues that they can be grouped into ‘families’ that reduce the mathematical complexity. While there is undoubtedly some correlation between proteins it remains to be seen whether this resolves the problem of how non-replicating systems can arise in the first place through a-bio-genesis. Dawkins has also developed computer programmes in an attempt to show that complex patterns can emerge relatively easily from disorder. Elliott Sober defends Dawkins’ claim that when properly understood Darwinian explanations continue to provide the best explanation and refers to Dawkins’ programme relating to the phrase METHINKSITISAWEASEL (Sober, 1993: 37-38). Intelligent Design proponents though have questioned Dawkins programme as flawed and maintained that the complexity found at the microbiological level cannot be so easily dismissed. Behe finds it inadequate because the goal of the programme is predetermined, while according to neo-Darwinism the goals are not pre-selected (Behe, 1996: 220-221). Alister McGrath also criticised Dawkins for placing teleology in his computer programme because it is directed towards a pre-determined goal when Dawkins believes that teleology is absent from nature (McGrath, 2005: 58).

It may be noted though that the mathematical arguments of Hoyle and others were taken up by various creationist groups and this is reflected in their literature from the 1980s onwards; that is at least a decade before they were picked by the Intelligent Design

proponents such as Dembski and Behe. In 1980 the hydrology engineer Henry Morris determined a universal probability bound of one chance in 10^{110} (Morris, 1980: 130-131), although later Morris and biologist Gary Parker considered a value of one chance in 10^{170} more appropriate⁴ (Morris and Parker, 1987: 269-271). So creationists had already embraced and developed a fledgling renewal of the design argument in the 1980s and they generally wanted to fit the design argument within a scientific account of creation, although one that was informed by a literalistic interpretation of Scripture. There are then perhaps two streams that worked to develop a renewed interest in the design argument; one largely secular or at least not theistic (Hoyle and Wickramasinghe, 1981; Denton, 1986) with later support from Flew (Flew and Varghese 2007); the other a form of creationism (Morris, 1980; Morris and Parker, 1987).

However, I don't have sufficient space in this thesis to attempt to resolve these scientific claims that relate to the mathematical quantification of the complexity of life, but intend to focus upon the philosophy of science and theology of the Intelligent Design arguments in this thesis. It needs to be borne in mind as well that the theory of evolution has been defended earnestly against creationist critics, and it may also be noted that even most creationists now accept a great deal of evidence for natural selection, but still within an overall belief in creation. Alexander points out for instance that Morris actually came to believe in the possibility of fairly rapid evolution through natural selection, but within a literalistic interpretation of Genesis (Alexander, 2008: 149). So the difference between creationism, Intelligent Design and Darwinism may not be as far apart as often might appear with a lot of evidence for natural selection, and some change over time, uncontested. To set the differences in context Darwin wrote for instance in *On The Origin of Species* (6th edition) that

There is a grandeur in this view of life, with its several powers, having been originally breathed by the creator into a few forms or into one; and that whilst this planet has gone circling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved (Darwin, 1876: 429).

⁴ This based on 10^{130} conceivable particles in the universe, each able to take part in 10^{20} events per second with the universe assumed for the sake of the argument to be 10^{20} seconds old.

By comparing this statement with Morris's position it may be seen that the main point of departure for Intelligent Design and creationism is perhaps the desire to replace the notion of 'a few forms or...one' with *many forms*. Creationism or Intelligent Design then may offer a polyphyletic approach to evolutionary change as opposed to a monophyletic approach; or in terms of the metaphor of a Darwinian tree of life, Intelligent Design and creationism perhaps offers explanations based upon an *orchard of life*. I will discuss further the place of naturalism in science in chapter three, but it may be noted that Intelligent Design does accept some of the Darwinian claims, even if holding that evolutionary explanations are necessarily incomplete. Many Intelligent Design proponents are not committed to a literalistic interpretation of Genesis and have various views about where the boundaries of evolution actually lie. Furthermore, they generally wish Intelligent Design to be seen as a science and not a religious position, although with some equivocation on this question when it is noted that one of Dembski's first books saw Intelligent Design as a 'bridge' between science and faith (Dembski, 1999). I will discuss this more fully in chapter four.

1.1.3. How Does Intelligent Design Compare With Classical Natural Theology?

There would appear to be at least some common ground between classical natural theology and Intelligent Design, as both seem to be focused upon investigating the apparent mechanical properties of nature. To some extent the modern design movement is really extending Paley's macro-level watchmaker argument to the microstructures found in the cell, the bacterial flagellum for instance being compared to an outboard motor by Behe (1996). But some of the classical proponents argued for the fixity of species because it reflected the divine plan. However, it is noteworthy today that very few proponents would maintain a belief in the absolute fixity of the species, believing instead that a great deal of adaptation is possible, even if some believe it to be limited in scope. A belief in the fixity of species was in fact influenced by the neo-Platonist' concept of 'plenitude' in which nature was believed to exhibit a great chain of being where everything that could exist does exist (McCalla, 2006: 16). As noted above, no one today believes in the fixity of species as most design proponents have moved to accept some of Darwin's claims, especially those that can be shown empirically, even if not the whole of the Darwinian narrative.

Dembski writes further that Intelligent Design is ‘more modest and more powerful than natural theology’ and believes that his work has helped to establish the design argument as a ‘robust program of scientific research’ as opposed to the classical argument that he claims was a ‘plausible but underdeveloped philosophical intuition’ (Dembski, 1999: 107). Intelligent Design then cannot be used to infer the goodness of God from evidence in nature as the works of Paley and John Ray⁵ had tried to do because he doesn’t believe it should seek to answer theological questions (Dembski, 1999: 107). In this sense then Dembski does not seek to make any claims about the nature or character of the designer. But while Christian classical design proponents did try and fit their work within Christian doctrine, there was also an undercurrent of deism, dualism and Platonic ideas in the thinking of some from the early modern period. Ray for instance criticised the type of purely mechanistic design argument envisioned by Descartes because it did not leave any room for the providential care of creation by God. He therefore considered the Cartesian philosophers to be ‘Mechanick Atheists,’ not because of their denial of God’s existence, but because such a deity was not the caring, personal and loving God of the New Testament (McCalla, 2006: 17). However, the type of Newtonian argument that Ray extended to organic life, where God may occasionally intervene providentially in nature, left him open to the type of criticism levelled against the design argument by Charles Darwin. For Darwin the vestigial evidence did not seem to provide evidence of God’s goodness at all. Not all Christian thinkers though were as optimistic about finding evidence of God’s goodness in nature; Thomas Burnet had for instance argued in *Sacred Theory of the Earth*, that the world was the ruin of a former more perfect plan (McCalla, 2006: 21-27).

But in trying to distance the design argument from the need to identify the designer, the present day proponents such as Dembski cannot completely escape from some of the historical debates about the nature and character of the designer that have taken place. This is because there was also diversity of opinion about the nature and character of the classical design argument. Having said that, although the often stated ‘official’ position of Intelligent Design does not seek to make any claim about the designer, it needs to be borne in mind that most are Christian theists who believe the designer is the God of the Judeo-Christian faith. Dembski has also tried to address the question of God’s goodness in light of natural evil in a recent book (Dembski 2009). It would seem that his desire is

⁵ Ray, with his text *The Wisdom of God Manifest in the Works of Creation* (1691), aimed to extend the Newtonian design argument from cosmology to living organisms (McCalla, 2006: 16).

to separate out the science of the design question from the theology, but it does make it difficult to categorise the movement when one of the leading proponents at the same time claims Intelligent Design makes no claims about the designer, but then himself develops theological ideas in areas which have a bearing upon the design question. Perhaps the problem arises because some of the natural philosophers of the eighteenth and nineteenth century were much less concerned to separate science and faith as naturalistic science does today.

Furthermore, Intelligent Design proponents, in seeking to claim their work is science and not theology, are also tapping into an Enlightenment model of thought regarding the place of evidence, direct experience and rational thought as sole foundations of knowledge. In this light they are seeking to find evidence for a designer from science, which raises theological difficulties. I will argue later that the design argument needs to be rested upon the type of Reformed-Augustinian presuppositions, such as Alvin Plantinga identifies from Augustine and Calvin (and Aquinas), for it to have theological validity (Plantinga, 1993; 2000; 2001: 339-361). McGrath has also questioned this Enlightenment mode of thinking and wishes to bring some of the Augustinian beliefs to bear upon a renewed vision for natural theology (McGrath, 2008; 2009).

1.1.4. Is Intelligent Design Really Creationism?

The question arises then whether Intelligent Design is really a form of creationism? It is certainly true that creationists were using many of the arguments that Intelligent Design proponents now use a number of years beforehand, although not all those with an interest in this area were theists. It is noteworthy I think as well that Morris and Parker's work said more about evidence for design than the major work of Phillip Johnson, *Darwin on Trial*, that is often cited as one of the foundational document of Intelligent Design (Morris & Parker, 1987; Johnson, 1994). Johnson seems to have set about his ideas as an attempt to undermine the Darwinian paradigm, and in that sense it appears to have been a fairly typical piece of creationist writing and did not seem to be engaged at that time in an endeavour to separate Intelligent Design arguments from creationism. Alexander also points out that for Johnson in 1996 the arguments were far more concerned with religion and philosophy than with science (Alexander, 2009: 295).

There is certainly some overlap between creationism and Intelligent Design, although it needs to be noted I think that creationism tends to be based upon arguments from interpretations of Scripture, while historically the intelligent design arguments have been based upon arguments from general revelation. Furthermore, the modern Intelligent Design proponents seem to wish to develop their line of reasoning even outside of general revelation by embracing purely scientific modes of thought. Alexander comments rightly I think that Intelligent Design is really a ‘first cousin’ of creationism although he acknowledges that there are differences (Alexander 2009:295). Intelligent Design covers a diverse range of religious persuasion from the Roman Catholic Behe, to the Baptist / Orthodox Dembski, and also some agnostics. Because of a strong desire to fit Intelligent Design within science there is a reluctance to even identify the designer and instead claim that their work is not theology, although Behe acknowledges his Catholic faith in God when pressed in interview (Alexander, 2009: 295). There is certainly much less concern amongst Intelligent Design proponents to harmonise their work with a scriptural doctrine of creation as is the case with creationists; and so questions about the order of creation, or the timeframe of creation are not an issue. So while creationists tend to accept religious presuppositions in their work starting from the belief that there is a designer, Intelligent Design proponents on the other hand believe that evidence for a designer can be gathered through science without the need for religious presuppositions.

So what factors led to the development of Intelligent Design out of creationism? There are perhaps several reasons, but the main reason I think relates to various political struggles and court battles that have taken place in America over the teaching of origins in the State education system.⁶ In other words, the desire to present Intelligent Design as science and not religion is arguably for the purpose of bringing religious considerations into the classroom in a way that respects the American Constitution concerning the ‘Establishment of Religion’ clause in the First Amendment. The fact that the Constitutional clause has changed in its meaning is another factor that has influenced the debate. Originally the desire of the authors of the Constitution was to allow freedom

⁶ A weaker reason may be a sense that creationism had become far too dogmatic and exclusive by the 1980s in insisting upon a recent creation, whereas prior to the 1960s there was general openness towards an older timeframe in creationist thinking. Intelligent Design could then be seen in part as a reinvigoration of old earth creationist thinking.

of religion amongst the diverse settlers without having an established church such as the Church of England. Many of the first settlers were religious dissenters who sailed to America to get away from what they believed were overbearing and politically established Churches in Europe with state control of religion, but amongst the settlers were those with various and differing doctrinal positions. There was a desire then in the American Constitution not to impose one doctrinal belief over another, but provide pluralism in religious matters in State institutions. However, the interpretation of this has subsequently changed so that legally there should now be a complete separation of Church and State in America. The main thrust for this came through the Supreme Court's ruling of 1947 (*Everson vs Board of Education*) that effectively forced expressions of religion out of the state school system (Fuller, 2007: 111-112). Fuller writes that this has had the effect of suppressing religious beliefs in public institutions and instead 'institutionalizes atheism,' and this is the exact opposite of the intention of the Constitution that sought to leave room for different religious expressions in public institutions. It is in this light that Intelligent Design arguments have been shaped as an endeavour to get some form of quasi-religious consideration into the State school system. However, various court battles such as *McLean vs Arkansas Board of Education* (1982) and *Edwards vs Aguillard* (1987) relating to the teaching of creationism failed to overturn the situation because creation science was seen and categorised as a religious position. It is noteworthy though that such is the perceived power of the American legal and constitutional system that religious conservatives considered it easier to change good philosophy and theology to fit with political reality than seek to adjust politics to fit with good theology and philosophy. It is in this context that the infamous Intelligent Design *Wedge Document* appeared outlining a long-term strategy to bring design into society, science and academia (Forrest, 2001: 5-53).

So I believe then that the emergence of the modern Intelligent Design arguments is a result in part of genuine developments in science in terms of our understanding of the nature of the universe and the complexity of life, but that the arguments have also been shaped by religious and political struggles in America over the meaning of the Constitution in terms of an 'Establishment of Religion' in American State institutions. Intelligent Design may then be seen in part as an outgrowth from creationism, but there are other factors and influences at work as well.

1.1.5. Intelligent Design And The Science - Religion Typology

In light of this discussion it is necessary to consider how the Intelligent Design arguments fit within the science and religion debate. This is though a complex discussion. Ian Barbour for instance in his four fold typology (conflict, independence dialogue, integration) considered that Johnson, an influential figure in Intelligent Design, should be classified as a religious literalist and therefore someone promoting a sense of conflict between science and religion (Barbour, 1997: 77-84). And Johnson's approach in his book *Darwin on Trial* (Johnson, 1994) was advocating an anti-evolution and anti-naturalistic approach to some extent. But even so, Johnson's challenge was to the necessity for purely naturalistic science, especially relating to the question of origins, and he did not see himself as being in conflict with all science. Mikael Stenmark points out that conflict in one area of the religion and science debate cannot be used to claim that someone is promoting a general conflict view (Stenmark, 2004: 254). This also gains support from Thomas Kuhn's consideration that areas of science are often in internal conflict because of competing paradigms (Kuhn, 1970). So to be in conflict with one scientific paradigm doesn't mean one is in conflict with all of science.

It is also clear I think that Intelligent Design proponents such as Dembski and Behe make a determined effort to argue that their work is science and not religion. In other words, they tend to see themselves as being very pro-science and not in conflict with science as a whole. If there is a tendency in Behe's work it is to follow Gould's idea that science and religion exist as Non-Overlapping Magisteria (NOMA) with Intelligent Design being very much in the science camp (Gould, 1999). Certainly there is a desire to locate Intelligent Design as science and not religion, so Behe could be seen to be publicly advocating an independence view, although I think the reality, perhaps partly in private, is that Intelligent Design is seen as offering a dialogue view between science and religion. As noted, one of Dembski's earlier books, with a Foreword by Behe, had a title and subtitle that asserted that 'Intelligent Design' provides 'The Bridge Between Science & Theology' (Dembski, 1999). In this work Dembski writes that the 'key to overturning naturalism is design', and that Intelligent Design will have an impact upon both science and theology. By this he means that he wishes to leave the door open to non-naturalistic explanations in science such as the advocacy of design explanations (Dembski, 1999: 14). So there is I think some tension amongst the Intelligent Design proponents between those who hold to the independence view between science and

religion and those who are more open to the dialogue or contact view, and the cause of this tension is the peculiar political landscape in America. But I think it would be wrong to label Intelligent Design as being in conflict with all of science, although proponents do seem to be in conflict with the view that science must always be naturalistic and that evolutionary explanations must be universally accepted. Of course, if science must always be naturalistic by definition then Barbour's claim would be right, but this definition of science has itself been contested in science, as I will discuss in subsequent chapters by examining the thoughts of Alvin Plantinga in dialogue with Michael Ruse on this matter (Plantinga, 2001: 339-361; Ruse, 2001: 364-385).

1.1.6. Alternatives to Intelligent Design

So what alternatives are there to Intelligent Design? The arguments really exist within a three-way debate that forms a triangle between naturalistic or evolutionary beliefs at one point, the design argument at another point, with a third point being a theological argument that holds the priority of faith in epistemology. In chapter two I will illustrate the shape of this debate with reference to Hume's *Dialogues Concerning Natural Religion* (Hume, 1947). However, this debate is complicated because some may hold the design argument apart from theism, while some others wish to hold to evolutionary accounts theistically. But for the sake of this discussion there are essentially two positions that raise objections to Intelligent Design.

The first is the evolutionary position that may be theistically held, together with a commitment to methodological naturalism. This is supported by the agnostic Michael Ruse, and some Evangelical Christians such as Denis Alexander and Francis Collins (Ruse, 2001: 364-385; Alexander, 2008; Collins, 2006). Generally speaking, theistic evolution holds to the neo-Darwinian synthesis that natural processes, involving natural selection and random mutations, can explain the emergence, diversity and complexity of life on Earth with direct divine activity considered unnecessary. God is though seen as working out-of-sight and in ways that are not detectable scientifically, and creation is believed to have 'functional integrity' (Van Till, 2001: 147-163; Allen, 1989; Stek, 1990: 261; McMullin, 2001: 165-196). There is though a commitment to a doctrine of creation and Oliver Barclay for instance accepts that design may be part of such a doctrine, although it was not stressed and only implied as part of a much richer appreciation of creation as a whole (Barclay, 2006: 56). There are further several forms

of theistic evolution that allow some form of directivity. Pierre Teilhard de Chardin developed the idea that the process of evolution was an all-encompassing theory and that God was drawing the whole of nature upwards towards the Omega point through evolution. He argued in *The Phenomenon of Man* that evolution should be seen as an illuminating light that guides all spheres of human thinking (Teilhard de Chardin, 1955). The Ukrainian Russian Orthodox Theodosius Dobzhansky was attracted to these ideas and promoted de Chardin's work as a means of establishing a harmony between evolutionary science and Christian faith. He believed further that the whole of biology only makes sense when illuminated by evolution (Dobzhansky, 1967; 1973: 125-129). Simon Conway Morris's view holds that the laws of nature are so finely tuned that if the process of evolution were rerun the same broad outcome would arise time and time again. Accordingly, the laws of nature force the evolutionary process to converge on similar outcomes, so that for instance fish, dolphins and penguins converge towards a similar streamlined shape because they are adapted to live in a common environment. There are then believed to be convergent 'islands of stability' that are found by the random search of evolution (Conway Morris, 2003: 127, 282).

The second position that raises challenges to Intelligent Design is one that recognises the priority of faith and various Augustinian-Calvinistic doctrines, and because its approach is one of 'faith seeking understanding' (*fides quaerens intellectum*) is sometimes referred to as Reformed Epistemology. Alvin Plantinga is one leading proponent, and it suggests that a belief in design may be held as true prior to any scientific investigation (Plantinga, 1993; 2000; 2001: 339-361). The design argument may then only offer a degree of coherence with Christian faith, and it cannot be used to prove the truth of religious doctrines or the existence of God. For Plantinga, with reference to Calvin and Aquinas, there is also an innate sense of divinity (*sensus divinitatis*) implanted into each person, although with acknowledgment that this ability to sense God may be damaged by sin (*the noetic effect of sin*) (Plantinga, 2000: 172-176, 213-216, 280-282). This position doesn't though necessarily undermine all arguments from design, but places it in subordination to revealed religion, and Michael Sudduth for instance has pointed out that Calvin believed that there is both an immediate and a mediate knowledge of God in creation (Sudduth, 1995; 2009). Where this position may agree with Intelligent Design is in the possible presence of divine *vestigia* or footprints of design left in the created order, as McGrath for instance discusses (McGrath, 2009: 76). Dembski writes that some pre-modern scholastics such

as Bonaventure believed in the existence of divine footprints in creation as characteristic signatures of divine agency (Dembski, 1999: 127). McGrath also believes that the natural theology of eighteenth and nineteenth century Enlightenment thought must be rescued and held within a Christian doctrine of revelation if it is to have any significance and validity for Christian faith (McGrath, 2009: 19-20; 2008). McGrath's approach is concerned with how we perceive marks of design in nature, and this was also the belief of Thomas Reid in response to David Hume's criticisms of design (Reid, 1780; 1872; Ratzsch, 2003: 124-144). McGrath also desires to develop an approach to natural theology based upon Augustinian Trinitarian beliefs, although McGrath also retains a commitment to theistic evolution (McGrath, 2009: 35-37, 95-108).

1.2. Shape of research

1.2.1. Chapter Two

I begin the second chapter of this thesis with an analysis of Hume's *Dialogues Concerning Natural Religion* (Hume, 1947). This analysis highlights the different positions held over the question of design. There are three characters and four positions outlined in Hume's work; from the Epicurean position of Philo together with his other interest in Greek pagan beliefs, to Demea who prefers to hold to cosmological and ontological proofs for God's existence, but doesn't think we can know anything about the designer or his ways, to Cleanthes who uses inferential and probabilistic reasoning in comparing the divine mind with the mind of human beings.

With this analysis complete it is possible to consider how the Intelligent Design ideas fit within this framework. I show that although the arguments are closest to the Cleanthes position because they utilise inferential reasoning, and speak in terms of 'machine-like' complexity, there are some notable differences. This arises because Intelligent Design proponents seek to make minimal direct statements about the designer and allow room for the possibility that the designer might be a Greek or Hindu deity along the lines of Philo's position in Part VII. This failure to make strong statements does though raise problems in both science and Christian theology for the Intelligent Design proposals. However, I believe it is possible, as I will argue in this thesis, to rescue Intelligent Design in both science and theology if it is held within a number of Reformed Augustinian doctrines as outlined for instance by Plantinga (1993; 2000). Reformed Augustinian doctrines such as the *Imago Dei* and the *Sensus Divinitatis* are though

divided in Hume's work between the characters of Demea and Cleanthes, and these two are set in opposition to each other. There are though reasons to bring together some of Demea's beliefs with those of Cleanthes, as I will discuss in the first chapter.

A number of commentators on Hume were consulted to see if it is possible to glean something of Hume's thinking in this work. Although it is not absolutely necessary to identify Hume's own position, some knowledge of his beliefs can be found. It is noteworthy that he was a sceptic of religious beliefs and the design argument, but also was sceptical that inductive reasoning could provide certain knowledge in science as well. This fed into the thinking of philosophers of science such as Karl Popper (2002) and has also influenced Plantinga (as I will discuss in chapter three). For this present research though I will focus also upon a number of objections from Hume's *Dialogues* to the design argument that have been identified by John Mackie in *The Miracle of Theism* (Mackie, 1982: 136-137). He set this up as a successive series of hurdles that the design argument must jump in order for it to be accepted. Mackie's five objections to the design argument are paraphrased as follows

Firstly, that comparison between natural entities and humanly designed artefacts really only provides weak or remote analogies.

Secondly, there are other non-theistic possibilities such as polytheism, pantheism, deism, or vegetation or generation.

Thirdly, the divine mind that is postulated by the design argument needs to be explained.

Fourthly, the question of the goodness and power of God is questioned in light of natural evil and suffering.

Fifthly, the design argument can have no explanatory power in science, thus rendering it useless as a scientific explanation (Mackie, 1982: 136-137).

In the second part of this chapter I will focus on the first of these objections; that is the question of an analogy to human intelligence. In the theology chapter (four) I will address the question of the identity of the designer, and the question of suffering, and in

chapter three the question of explanatory power in science. I will only touch upon the third of Mackie's objections due to insufficient space in this thesis. There are though two additional claims to those of Mackie relating to the design argument that ought to be addressed; primarily in the philosophy of science is Michael Ruse's insistence that science must follow the rules of methodological naturalism (Ruse, 2001: 364-385); and further in theology is how Intelligent Design might respond to the divine action debate.

So, having analysed Hume's *Dialogues* and identified a number of objections from Mackie's interpretation of Hume, together with a couple of other questions in the first part of chapter two, I then seek to address the first of Mackie's objections in the second half of chapter two. That is that the design argument is only a weak or remote analogy to human intelligence. In order to do this I first looked at the further dialogue between Swinburne and Mackie (Mackie, 1982; Swinburne, 1979; 1991; 2004), but note that although Swinburne's response is useful it is mainly concerned with temporal order and not the spatial order that interests Intelligent Design proponents. However, with reference to the thinking of Elliott Sober it is noted the Intelligent Design arguments may be framed as an inference to the best explanation and can escape the claim that it is only based upon weak analogical reasoning. Sober though comments that the real challenge to Intelligent Design is in explanatory power and testability (Sober, 2007: 3-8); this I will address in the second part of chapter three.

1.2.2. Chapter Three

Before engaging with the question of explanatory power in chapter three it was first necessary to respond to Ruse's objection to Intelligent Design relating to the requirement for methodological naturalism as a clear demarcation criterion for science (Ruse 2001:364-385). As noted already some theists support this, and hold that Christians in science should accept that nature possesses functional integrity with direct divine activity rejected (Van Till, 2001: 147-163; Allen, 1989; Stek, 1990: 261; McMullin, 2001: 165-196). In dialogue with Ruse's claims I considered the arguments of Plantinga that it is possible to do what he calls Augustinian science; that is a science that may begin with foundational commitments that are gathered from theistic belief. This comes out of the Augustinian recognition that both religious and secular knowledge claims really begin from a place of faith (*fides quaerens intellectum*). Although I don't have space to discuss what Plantinga means by Augustinian science in

sufficient depth, a number of further doctrines can be found in Plantinga's writing, and in that of other Reformed theologians, that may relate to Intelligent Design. These doctrines include a belief that human kind is created in the image of God wherein there is prior acceptance of a corresponding rational, volitional, emotional and relational capacity. And as mentioned already other relevant doctrines include the *sensus divinitatis*, the presence of *vestigia Trinitatis* and the noetic effect of sin (Plantinga, 2000; McGrath, 2008; 2009: 76). This noetic doctrine suggests however that there will be a fundamental difference between the way the believer and the non-believer approaches science, as Plantinga for instance observes using as an illustration Augustine's comparison between the City of the World and the City of God (Plantinga, 2001: 339-361). Out of this he proposes that each side should do science in its own way.

Some support for Plantinga's proposal comes from the dialogue between Imre Lakatos and Paul Feyerabend (Feyerabend, 1970; Lakatos, 1976; 1978; Lakatos and Feyerabend, 1999). Feyerabend was opposed to methodological monism in science because he saw it as excessively dogmatic and therefore restrictive of future discovery, and perhaps even tyrannical at times (Feyerabend, 2011). Instead he believed that there should be a great deal of freedom in science, although Lakatos saw this as a form of relativism that would undermine the concept of objective truth and science itself. Lakatos argued instead that for science to be possible some core commitments must be held dogmatically, even if that entails acceptance of competing research programmes with different prior commitments. The balance then is to avoid excessive relativism that undermines objective truth, and excessive dogmatism that restricts scientific freedom and future discovery. If we consider how this might relate to the Intelligent Design arguments, I would suggest the failure of proponents to make strong prior commitments risks relativism and weakens their claim that it is good science. Instead I argue that proponents would do well to embrace the type of core commitments of Reformed theologians and seek to fit Intelligent Design within an Augustinian science. In that way its credentials as good science would be strengthened and not weakened.

In the second part of chapter three I look further at the shape of an Intelligent Design research programme and consider whether it can make testable predictions and have explanatory power. The main problem for this endeavour is the need to make sufficiently strong prior commitments to allow for a process of testability. Such commitments for Intelligent Design will though be theologically informed, something

proponents seek to resist. There is firstly the possibility of accommodating data into a coherent pattern within historical areas of science instead of necessarily making predictions. There are though question marks about whether there can be true objectivity because of lack of distance between the knower and that which we seek to know. And people naturally reach design conclusions in every day life without even seeking to justify it rationally, a process known as Gestalt psychology. However, science is also often forced to use devices such as self-evidencing explanations for it to begin to develop an understanding of the world. In this light, Intelligent Design will at least be in good company with other areas of science, including Darwinian evolution, even if it does lack perfect objectivity.

I then analysed the development of research programmes from Polanyi to Lakatos and noted that there is some Augustinian influence in this scientific endeavour, particularly from Polanyi (1946; 1964; 1958; 1968), but also in Lakatos who was a convert to Calvinism. Lakatos believed it acceptable to hold a core of ideas dogmatically in science in order to maintain a commitment to objective truth, and for this reason I have argued that the framework of a Lakatosian research programme offers the best way forward for an Intelligent Design research programme, and there is some coherence between this and Plantinga's argument for an Augustinian science. However, core commitments for Intelligent Design will appear to be of a theological nature; one core commitment, I would suggest, is that design in nature is real, but if that is so then it follows by logical deduction that there is a designer. Nancy Murphy is willing to accept Intelligent Design as a theological Lakatosian programme, but doesn't think it should be understood as science (Murphy, 2001: 451-469). However, Robert Russell believes it is possible to allow theological doctrines to inform science although perhaps not to the extent that Plantinga has argued for (Russell, 2008: 21-22). My own approach here is to recognise that all approaches to science begin in metaphysical commitments of some form, and that it is possible to see Augustinian science in terms of it being a Lakatosian *meta*-research programme (and in this light methodological naturalism would also be seen as a meta-research programme). I believe holding Intelligent Design within the framework of a theologically informed meta-research programme would allow it to be considered good science, whereas outside it risks the weakness of relativism in science and theology. In the next chapter I consider further some theological issues with Intelligent Design.

1.2.3. Chapter Four

In chapter four I turn to consider the theological implications of Intelligent Design. The first question is whether a design argument can say anything about the nature or character of the designer. Proponents of Intelligent Design make minimal statements in this regard and believe their work is science and not theology. However, they also make comparisons between human artefacts and bio-molecular ‘machine-like’ complexity, which looks very much like an analogy to human intelligence. From this I suggest that the natural approach for Intelligent Design in the science-faith dialogue should be one of overlap and not mutual exclusion, or even mutual support as Dembski suggests. Dembski further allows for the possibility that the designer may not be the Judeo-Christian deity when writing from a scientific perspective, but also writes that for Christians all disciples should be approached and conducted within a framework of a ‘word-flesh Christology,’ and that Christian theology has ‘preeminence...particularly amongst the sciences’ although, for Dembski, the Christological lens doesn’t violate the independence of science (Dembski, 1999: 206).⁷ However, I wonder whether there is a measure of ambiguity here that raises theological difficulties for the way the Intelligent Design arguments are framed. Instead I argue in this thesis that Christian theists may move beyond Enlightenment modes of thought in science to embrace foundational Augustinian-Calvinistic doctrines where Christian beliefs may provide foundational commitments that enable science to begin. It is noteworthy that Karl Barth likened natural theology to a tower of Babel enterprise because of its independence from revealed theology; although Thomas Torrance has argued that natural theology may be rescued as theologically sound if held within revealed faith (Barth, 1957; Torrance, 1970: 121-135). Proponents of Intelligent Design need to respond to this Barthian objection so that it might be redeemed theologically. Barth’s objection also has echoes in the writing of Roy Clouser and John Henry Newman (Clouser, 2005; Newman, 1864; 1870; 1907).

In the second part of chapter four I discuss the divine action debate and how it might impact upon Intelligent Design. Again my approach is broadly Augustinian-Calvinistic,

⁷ Dembski writes that whereas Karl Barth believed a Christological lens was the basis for Christian theology, he wishes to extend this to encompass all disciplines, although he doesn’t believe such a Christological lens violates the integrity and independent of science because he believes that Christ is a completion of science and not an addendum (Dembski, 1999: 206-207).

although recognising there remains an unresolved paradox between determinism and freewill. With reference to the work of Russell (1997; 1998; 2008), Murphy (2001) and Miller (1999; 2004) it is noted that quantum mechanics may allow a divine agent to act in nature in ways that are of a non-interventionist form, and Behe seeks to endorse this (Behe, 2004), but it does not go far enough to account for the existence of irreducible complexity in bio-molecular systems that Behe finds so fascinating. Intelligent Design theory may be framed as a theory of information, and this has some support from Torrance (1980b), and from Francis Collins (2006) as a metaphor, but again it doesn't capture the actual claims of Intelligent Design that involve claims about three-dimensional shape. Instead the claims of Intelligent Design proponents looks much more like an interventionist approach to divine action, although in light of Torrance's rejection of a strong dualism between the natural and the supernatural in divine action the language of interventionism is perhaps inadequate; instead interaction is preferred. How a divine agent may interact physically in the world remains mysterious, but that doesn't mean it should be rejected as an ontological possibility *a priori*.

The third part of chapter four is concerned with the question of Intelligent Design, suffering and divine justice, and I seek to develop an understanding in Augustinian-Reformed terms. Calvin for instance believed that God's power is worked-out through his justice (Sudduth, 1997). I start by reviewing the literature in evolutionary theodicy through for instance Russell (2008), Southgate (2002; 2008) and Williams (2001); they generally reject the notion of a literal Fall from grace that might be seen as the cause of suffering and death, and instead seek to offer an answer to death and suffering in terms of it being a sort of unavoidable by-product of God's good work in creation. On the other hand a number of evolutionary scientists such as Denis Alexander and Sam Berry seek to hold to an understanding of the Fall as being the cause of spiritual death through Adam and Eve as *Homo divinus*, even though not considered the cause of physical death (Alexander, 2008; Berry, 2009; Stott, 1972). There are though a significant number of Reformed theologians who maintain that Scripture really does speak of the Fall as the cause of physical and spiritual death. This raises a difficulty for those who wish to retain a commitment to Intelligent Design and long geological ages and yet believe the Fall had spiritual and physical consequences for human and animal suffering. Dembski has though produced a novel scheme to overcome this problem that involves the ontological reality of human sin being applied retrospectively, this in the same way that some Calvinists believed that Christ's work on the cross was applied to the children of

Abraham who live before Christ. Dembski follows John Hick in seeing the beneficial side of suffering to be akin to a school for developing the human soul. By linking Dembski's scheme to Alexander and Berry's belief in *Homo divinus* it may offer a type of evolutionary theodicy as well as potentially being compatible with various forms of Intelligent Design creationism (Hick, 1966; Dembski, 2009). The problem is though whether it is theologically valid to apply the effect of sin retrospectively, and question marks do remain, but it may be noted that no form of theodicy is completely free of problems.

2. Hume's *Dialogues* and Intelligent Design

There are a number of notable objections to the design argument in Hume's work *Dialogues Concerning Natural Religion* that need to be addressed, especially in terms of their application and relevance to the more modern Intelligent Design arguments. But also the *Dialogues* provide a very useful illustration that will help in understanding the shape of the overall debate, and it is worth then analysing this work in some depth with a short discussion about its structure and content. I will also consider how this work fits with Hume's wider philosophy. From this it may be possible to better understand Hume's actual belief about the nature of science and the design argument.

In the second part of this chapter I will turn to consider the first of Mackie's objections to the design argument that he identifies from the *Dialogues*; that is the claim that Hume fatally undermined the design argument by arguing that it is based only a weak analogy to human intelligence. In response, I will look for instance at further dialogue between Mackie and Swinburne, and work by Elliott Sober, and consider whether the design argument needs to be framed in terms of analogical reasoning or whether it may instead be framed differently, such as in terms of an inference to the best explanation.

2.1. Hume's *Dialogues Concerning Natural Religion* – Introduction and Analysis

Hume's work *Dialogues Concerning Natural Religion* was published in 1779 three years after his death. The *Dialogues* is not an easy piece of literature to read, as it consists of an exchange between three characters Cleanthes, Demea and Philo, but one retold by a listener Pamphilus to a friend Hermippus. Cleanthes is presented as the tutor of Pamphilus. In the *Dialogues* Hume writes, through the mouth of Pamphilus, that Philo is the *careless sceptic*, Cleanthes the *accurate philosopher*, while Demea is *rigidly orthodox* (Gaskin, 1978: 161). Cleanthes is given the task of defending the classical design argument through an appeal to an analogy to human intelligence, and is perhaps the closest to the modern Intelligent Design proponents. Philo offers a number of objections to the design argument and draws upon Greek thought from an Epicurean perspective, but also argues from the writing of Hesiod and Plato in Part VII. Demea's position on the other hand is to argue that evidential approaches to design are ultimately fruitless because they cannot be established with absolute certainty; instead Demea prefers ontological and deductive cosmological arguments, and also believes people

must feel and experience the truth of religion before engaging in natural theology (Hume, 1947: 193). Demea's position here is perhaps reflected in the idea of a *sensus divinitatis* that Plantinga traces back to Thomas Aquinas and John Calvin (Plantinga, 2000: 167-177).⁸ For much of the dialogue Demea forms an alliance with Philo, but he later feels betrayed when he observes that Philo is taking his argument towards atheism.

The three characters set out their positions in a discussion over the use of reason in theology, and both Demea and Philo argue, for different reasons, that children should not be taught about Natural Theology until the end of their education. Demea's position is based on concern about disputation and desire to first instil piety and reverence for the principles of religion; Philo takes this view because he considers such teaching to be of no value anyway. Cleanthes disagrees and argues that sceptics fail to live up to their own statements, and that everyone makes use of reason in support of their position (Hume, 1947: 130-140). Cleanthes and Demea represent two separate strands of thought associated with Christian theology, and Philo is seen exposing and exploiting the differences between the two positions. Cleanthes is given the credit for the better argument in the final summing up, but Philo is allowed prolonged almost unchallenged discourse towards the end, and concedes with little apparent conviction that the cause of the universe may be presented as merely a 'weak analogy to human intelligence.' Interestingly, when Demea presses Philo (in Part VII) that his own argument may also be a form of a design argument, Philo doesn't strongly object, but merely asks whether the emergence of order must always be associated with intelligent thought; in other words his is an impersonal approach (Hume, 1947: 179). So in the *Dialogues* we have three central characters, but because of Philo's wide ranging claims we have four positions set out, with Philo arguing from two different positions. I will now go through the *Dialogues* and pick out the individual dialogues between the characters.

⁸ Aquinas, *Summa Theologiae* I,q.2,a.1. 'To know in a general and confused way that God exists is implanted in us by nature.' While Calvin wrote that 'There is within the human mind, and indeed by natural instinct, an awareness of divinity. This we take to be beyond controversy. To prevent anyone from taking refuge in the pretense of ignorance, God himself has implanted in all men a certain understanding of his divine majesty. . . . Men of sound judgment will always be sure that a sense of divinity which can never be effaced is engraved upon men's minds. Indeed, the perversity of the impious, who though they struggle furiously are unable to extricate themselves from the fear of God, is abundant testimony that this conviction, namely, that there is some God, is naturally inborn in all, and is fixed deep within, as it were in the very marrow.' *Institutes* I, iii, 1, (Calvin, 1960: 43, 45, 46).

2.1.1. Cleanthes versus Philo

Cleanthes argues his case through the use of analogical reasoning, where for instance the world is considered to resemble a great machine with living organisms playing a precisely ordered part as lesser machines in the whole. Such natural contrivance, Cleanthes argued, ‘resembles’ and ‘exceeds’ human contrivances that are formed ‘from human designs, thought, wisdom and intelligence’ (Hume, 1947: 143). Therefore Cleanthes argues that the ‘Author of Nature’ resembles in some way the mind of man, although by inference the designer is proportionally greater in wisdom (Hume, 1947: 141-151). Cleanthes continues to make his case for design, using as an example of contrivance the eye. He comments.

Consider, anatomize the eye; survey its structure and contrivance; and tell me, from your own feeling, if the idea of a contriver does not immediately flow in upon you with a force like that of sensation. The most obvious conclusion, surely, is in favour of design; and it requires time, reflection, and study, to summon up those frivolous, though abstruse objections, which can support Infidelity. (Hume, 1947: 154)

Philo accepts that all inferences are based on experience, but argues that our own ideas about God cannot be trusted and that analogical arguments must be based on exact similarities to be of value. Philo discusses analogical arguments from design noting that they are strongest when we have many examples or experiences to draw upon. However, for the ‘origin of worlds’ we have no such experience.

When two species of objects have always been observed to be conjoined together, I can infer, by custom, the existence of one wherever I see the existence of the other; and this I call an argument from experience. But how this argument can have place, where the objects, as in the present case, are single, individual, without parallel, or specific resemblance, may be difficult to explain. And will any man tell me with a serious countenance, that an orderly universe must arise from some thought and art like the human, because we have experience of it? To ascertain this reasoning, it were requisite that we had experience of the origin of worlds; and it is not sufficient, surely, that we have seen ships and cities arise from human art and contrivance. (Hume, 1947: 149)

Philo argues further that we can infer from experience the existence of a human head if we see only the limbs of the human body, but with natural phenomena and the formation of worlds we lack the necessary experience to make a judgement about design because the dataset we have is too small (Hume, 1947: 170). We have absolutely no experience of the design of other worlds to make a judgement about the present world, as judgements based upon probability require an analysis of relative frequency. Philo endorses this dilemma by claiming that we can only use, as a basis for analogy, the effects alone. Philo accepts that natural entities display the appearance of contrivance, and that they resemble therefore human artefacts that have been fashioned by human design. However, he wants to place limits on such analogical arguments, and asserts that we can only attribute to the *cause* that which is absolutely necessary to produce the *effect* (Hume, 1947: 165). Earlier Philo suggested that if ideas can organise themselves within God's mind, then why not in material entities as well. Philo claims that the need to find external causes to the present material world may only lead to an infinite regression and he finds no satisfaction in such a state of affairs commenting that it would be better not even to look beyond the material world (Hume, 1947: 161).

Philo elaborates on these ideas with his Epicurean perspective, suggesting that the order of the universe has come about via finite particles moving through an eternity of time (Hume, 1947: 182). So he claims that the universe is the source of its own order, and all combinations are therefore available to bring about the order we observe. Cleanthes rejects such assertions and asks how the benevolent aspects of nature could have arisen by such blind processes (Hume, 1947: 185). Philo comments that an analogy of mechanism is more acceptable than an analogy of morals between mankind and the designer, and offers Cleanthes a compromise by accepting that the anthropomorphic design argument may be acceptable as a weak analogy if it is strictly limited to direct examples. Philo comments.

If the whole of Natural Theology, as some people seem to maintain, resolves itself into one simple, though somewhat ambiguous, at least undefined proposition, That the cause or causes of order in the universe probably bear some remote analogy to human intelligence: if this proposition be not capable of extension, variation, or more particular explication: if it affords no inference that affects human life, or can be the source of any action or forbearance: and if the

analogy, imperfect as it is, can be carried no further than to the human intelligence, and cannot be transferred, with any appearance of probability, to the qualities of the mind; if this really be the case, what can the most inquisitive, contemplative, and religious man do more than give a plain, philosophical assent to the proposition, as often as it occurs, and believe that the arguments on which it is established exceed the objections which lie against it? (Hume, 1947: 227).

Interestingly then, Hume's character Philo left the idea of design as only a weak analogy with human intelligence and argued that a stronger analogy would require a closer match between nature and human artefacts. The other main objection raised by Hume is that no one has experience of the design of other worlds to make a judgement based on experience. Philo therefore sees design as an inductive generalisation that lacks relevant examples.

2.1.2. Philo Part VII

While seemingly being a general sceptic and offering an Epicurean cosmology, Philo also develops a perspective based upon Greek and Eastern religious beliefs, asserting that the universe resembles more the product of an animal or vegetable than a human artefact; therefore the universe by analogy may be considered a living organism. Philo's argument for a world soul is developed in Part VII of *Dialogues*. This leaves some ambiguity as to whether Philo is really supporting an Epicurean perspective or one closer to Greek or Hindu pantheism, or whether he is just making whimsical arguments. Cleanthes responds that if the world resembles an animal, then like an animal it arises via generation, but accuses Philo of making whimsical arguments that cannot convince (Hume, 1947: 176-181). Philo further sets out in some detail an argument based on the belief that there is a source of generation within nature and that the world might possess a soul. Philo does though insist on asserting that 'we have no data to establish any system of cosmogony' because human experience is imperfect and limited in extent and duration, and can therefore provide no 'probable conjecture concerning the whole of things' (Hume, 1947: 177). Hume's scepticism is therefore put into the mouth of Philo and it would appear, at face value, that he is simply raising the notion of an animal-like world soul in order to use it as a tool against the design argument of Cleanthes on the basis that both are equally unlikely. But Philo goes further and asks what rule ought we to use to determine a choice, if forced to 'fix on some hypothesis.' Philo suggests that

such a rule can be found in vegetation or generation by ‘examining the ancient system of the soul of the world’ (Hume, 1947: 176-177). Philo argues that his system offers a closer analogy than Cleanthes’ design argument because it is our experience that there is a power of generation in nature, and that the world is closer to a vegetable or animal than a machine.

And does not a plant or an animal, which springs from vegetation or generation, bear a stronger resemblance to the world, than does any artificial machine, which arises from reason and design? (Hume, 1947: 177).

Philo suggests that just as a tree sheds its seeds into the surrounding fields in order to produce other trees, the ‘great vegetable’ that is the world or planetary system also produces seeds, which are scattered into the chaos, and these then ‘vegetate into new worlds.’ Philo suggests that a comet might be the seed of a world, or the world might be an animal, and a comet the egg of an animal. Philo argues that generation and reason are words that ‘mark only certain powers and energies in nature, whose effects are known, but whose essence is incomprehensible’ and further asserts that there are four principles known on the earth, which are ‘reason, instinct, generation [and] vegetation,’ but that there may be other unknown principles in the cosmos (Hume, 1947: 178). As noted, Philo argues that order need not spring from thought and that from our limited and imperfect experience, reason is known to come from generation, but generation is not known by experience to come from reason (Hume, 1947: 179).

Philo compares his argument on the great principle of generation to Cleanthes’ design argument and argues that his analogy is stronger than that of Cleanthes. ‘The world, say I, resembles an animal; therefore it is an animal, therefore it arose from generation.’ Philo confesses that his steps are wide, and that there is ‘some small appearance of analogy in each step.’ On the other hand Cleanthes argues that the world ‘resembles a machine; therefore it is a machine, therefore it arose from design.’ Philo notes that the steps in Cleanthes’ argument are equally wide, but he asserts that the analogy is less striking (Hume, 1947: 180). Philo further claims that his system is sourced from the ‘ancient mythologists’ such as Hesiod and Plato, and also from the Brahmins who believed the world arose from an infinite spider (Hume, 1947: 180).

Hesiod, and all the ancient mythologists, were so struck with this analogy, that they universally explained the origin of nature from an animal birth, and copulation. Plato too, so far as he is intelligible, seems to have adopted some such notion in his *Timaeus* (Hume, 1947: 180).

Hesiod was a Greek poet who lived around 700 BC, and one of the works attributed to him is the poem *Theogony*, which is concerned with the origins of the world and of the gods. According to Hesiod the first god to arise was *Chaos* who was said to have arisen spontaneously, followed by *Gaia*, *Eros* and *Nyx*. A whole pantheon of gods, elements and living animals were then generated. Interestingly, Erasmus Darwin, an acquaintance of Hume through the Edinburgh based Scottish Enlightenment, interpreted Philo's comments in Part VII of the *Dialogues* as the real message of Hume, suggesting the 'powers of generation' derive from the 'GREAT ARCHITECT' (Darwin, 1803: 400-401).⁹ The demiurge appears in the *Timaeus* as a divine craftsman understood in human terms, and was said to have fashioned and shaped the material world out of a pre-existing chaos. Although the demiurge wanted the world to be as perfect and as good as possible, it was imperfect because he could only make the universe out of the pre-existing matter and chaos. David Sedley comments that the pagan religions generally did not consider the act of creation by a divine agent as being out of nothing (*ex nihilo*), as he believes Christians generally understand the Jewish Scriptures, but always out of matter in a pre-existing chaos that suggested an eternal cosmos. Neither did the pagans have much interest in the literalness or authority of religious texts, as is the case with Judeo-Christian reading (Sedley, 2007: xvi, xvii). Sedley further comments on the difficulty in interpreting Plato suggesting that the image of god as a human craftsman is really mythology, and that the *Timaeus* ought to be read in a more allegorical manner (Sedley, 2007: 98-107).

It is an interesting observation then that Hume's character Philo, in Part VII, appeals to an allegorical reading of the *Timaeus* as a 'power of generation' as part of his broad

⁹ Erasmus Darwin writes "The late Mr. David Hume, in his posthumous works, [*Dialogues*] places the powers of generation much above those of our boasted reason; and adds, that reason can only make a machine, as a clock or a ship, but the power of generation makes the maker of the machine... increasing by the activity of its inherent principles, rather than by a sudden evolution of the whole by Almighty fiat.—What a magnificent idea of the infinite power of THE GREAT ARCHITECT!" (Darwin, 1803: 400-401). Charles Darwin's work though is closer to Philo the Epicurean.

attack upon Cleanthes' argument, and this might appear at face value to offer support to the idea of a designer of some sort, although how we are to understand design in the context of an impersonal force is not entirely clear.¹⁰ I think there is some relevance in considering this facet of the *Dialogues* because Intelligent Design proponents make only minimal claims about the designer and allow for the theoretical possibility that the designer may in fact be a Greek or Hindu deity. Mackie also raises this point and questions whether it is possible to know anything of the attributes of the designer from the design argument. I will return to discuss this within the theology chapter because it does I think raise theological questions for Intelligent Design.

2.1.3. Cleanthes versus Demea

Hume also sets out in the *Dialogues* a sharp distinction between Demea's and Cleanthes' positions, presenting a number of dualisms of view in the two religious characters for the purpose of exposing the weakness of each side, seemingly playing one off against the other. Firstly, Hume contrasts Demea's unknowable God with Cleanthes' anthropomorphic God; secondly, Demea's apparent fideism with Cleanthes' evidentially based faith; thirdly, he distinguishes Cleanthes' inferential claim that it is possible to recognise the goodness of God from evidence in nature, from Demea's recognition of goodness and evil in nature and his claim that God's purposes are unknowable.

Cleanthes is first shown presenting God in anthropomorphic terms as a designing mechanic, while Demea abhors the idea that we can know anything about the nature of the deity. Cleanthes asks his hearers to look around the world and 'contemplate the whole and every part of it' noting that people will find it 'nothing but one great machine, subdivided into an infinite number of lesser machines' (Hume, 1947: 143). This machine-like quality is then subdivided to a degree that is beyond human sense comprehension and explanation.

All these various machines, and even their most minute parts, are adjusted to each other with an accuracy which ravishes into admiration all men who have

¹⁰ Steve Fuller notes, from Leo Strauss, that there is often a 'double truth' in many works of philosophy with a hidden, esoteric meaning for the initiated and a plain sense exoteric reading for the population as a whole (Fuller, 2007: 52-53; Strauss 1952).

ever contemplated them. The curious adapting of means to ends, throughout all nature, resembles exactly, though it much exceeds, the productions of human contrivance; of human designs, thought, wisdom, and intelligence. Since, therefore, the effects resemble each other, we are led to infer, by all the rules of analogy, that the causes also resemble; and that the Author of Nature is somewhat similar to the mind of man, though possessed of much larger faculties, proportioned to the grandeur of the work which he has executed. (Hume, 1947: 143).

Philo though queries Cleanthes' bold assertions and asks him why he does not '...become a perfect Anthropomorphite?' (Hume, 1947: 168). Demea on the other hand believes that the nature of God is so ineffable and sublime that talk of God as a designer in fact reduces the deity to a human scale (Hume, 1947: 156). On the nature of God, Demea states that the deity is '...altogether incomprehensible and unknown to us' (Hume, 1947: 141), and therefore Demea 'could not approve of [Cleanthes'] conclusion concerning the similarity of the Deity to men' and comments that Cleanthes' argument gives 'advantages to Atheists.' (Hume, 1947: 143). Demea further claims support from the Platonists for the idea that God is unknowable (Hume, 1947: 138).

Secondly, Demea prefers *a priori* ontological and cosmological proofs for God's existence, but fundamentally relies on faith and belief that people are able to feel the truth of religion in their own breast (Hume, 1947: 193; Mackie, 1982: 135). Cleanthes' position on the other hand is evidence based, seeking to rest on *a posteriori* argumentation, although Demea maintains that such claims of Cleanthes are probabilistic and therefore unsatisfactory. Demea comments that he cannot approve of the mediums Cleanthes uses in establishing his argument, noting that there are no abstract philosophical arguments in Cleanthes' schemes, or *a priori* presuppositions that have been useful to philosophers and theologians in history. Demea criticises Cleanthes for basing his argument on experience and probability instead of rational proofs for the existence of God (Hume, 1947: 143). Cleanthes on the other hand asserts that Demea is a 'mystic' and asks how Demea's conception of God differs from that of sceptics and atheists. Demea's response is to note that anthropomorphism is an equally damaging claim against Cleanthes as that of 'mystic,' because God is immutable and beyond comprehension, whereas man's thoughts are often changing (Hume, 1947: 158-159).

Thirdly, Demea believes the design argument is counter-productive and recognises that as well as exemplifying goodness and beauty, the world is also a place of brokenness, corruption and trial, but because God's mind and purposes are completely unknowable to humanity, the question of the justification of God in light of such suffering is not an issue (Hume, 1947: 193). However, Cleanthes' argument in effect leads to the claim that all of nature reflects the goodness of God because he believes creation should be described, in whole and in all its parts, as a perfect machine (Hume, 1947: 143). As the world does indeed often seem to be a place of brokenness and trial as well as beauty and goodness, the views of Demea are compelling, but the question of goodness and evil relate to the character of the designer and do not necessarily address the question of the existence of a designer. Demea leaves the scene at the end of Part XI with Cleanthes and Philo continuing the dialogue together. It may be noted that there are perhaps aspects of deistic thought in Cleanthes' position, while Demea's God is so elevated as to be unknowable. Cleanthes' cosmos works with clockwork precision thus potentially removing God to a distant past, or making God an uninterested observer. As noted, both Cleanthes and Demea assert that the other's argument will lead to atheism, one because God is elevated so high as to be unknowable, the other because God is brought down to the level of mankind. For much of the discussion Demea seems to support the notion of the incomprehensibility of God as argued by Philo, but as the discussion develops he finds Philo has really only been betraying his support.

Hold! hold! cried Demea: whither does your imagination hurry you? I joined in alliance with you, in order to prove the incomprehensible nature of the Divine Being, and refute the principles of Cleanthes, who would measure every thing by human rule and standard. But I now find you running into all the topics of the greatest libertines and infidels, and betraying that holy cause which you seemingly espoused. Are you secretly, then, a more dangerous enemy than Cleanthes himself? (Hume, 1947: 212-213).

Cleanthes responds that all along Philo has been playing them off against each other and questions why Demea has been so slow in perceiving it. Cleanthes replies that from the beginning Philo, '...has been amusing himself at both our expense...' (Hume, 1947: 212-213). There are though I believe useful insights in the position of each side, and that a coherent theistic understanding of design will necessitate holding in balance the

two positions of Demea and Cleanthes, instead of holding them in opposition, as Hume seems to do.

2.1.4. Discussion of the *Dialogues*

So that is an overview of the structure and arguments of Hume's *Dialogues*. There are a number of questions that arise out of this that I want to look at in the following discussion. The first general question is how does this work fit in with Hume's wider beliefs, and who really represents Hume in the *Dialogues*? Consideration of this question will help later in response to Mackie's objections to the design argument. Mackie's objections can be stated as follows. Firstly, that the design argument is based on a weak analogy to human intelligence; secondly, that even if the natural order can be explained by analogy, there are other non-theistic explanations such as polytheism, pantheism, deism, or vegetation or generation. Philo also considers the possibility that the designer may be embodied. Thirdly, how can the divine mind, which is postulated by the design argument, be explained? The fourth question is concerned with suffering and the goodness of God, and fifthly, even if the design hypothesis were to pass the previous four tests, it would have no explanatory power in science, rendering it useless as a scientific explanation (Mackie, 1982: 136-137). But before I begin to engage with Mackie's objections, I want to consider Hume's *Dialogues* in further depth.

Gaskin is interested in asking two important questions concerning Hume's *Dialogues*. Firstly, which of the characters represents Hume's view, and secondly, is Hume questioning the nature of God or his existence? It may be noted for instance from a careful reading of the *Dialogues* that the apparent motivation of Hume was to question the *nature* of God, not to openly question the *being*, or existence of a deity of some form (Hume, 1947: 142; Gaskin, 1978: 159). In the *Dialogues*, Philo is given the task of attacking the anthropomorphic design argument of Cleanthes, and thus questioning what further inferences can be made about the nature of such a designer. Hume was seemingly sceptical of many things, but he stated in private letters that he was not a complete atheist who believed nothing. Instead he believed some things, but not 'every thing' (Hume, 1954: 231; Gaskin, 1978: 159). Hume was perhaps also sceptical of the absolute atheism of someone like Baron d'Holbach, and it has been suggested by Paul Russell that Hume may be seen more as an irreligious person as opposed to an atheist (Russell, 2008). David O'Connor agrees that Hume was not a complete atheist and that

he did not dismiss all possible conceptions of the deity, but neither did Hume subscribe to a standard Christian theistic belief (O'Connor, 2001: 19). The ambiguity in Hume's work was perhaps useful as it meant it was difficult to categorise his real religious position.

Hume allows Cleanthes to be the open winner of the debate, but Gaskin observes that anyone reading the *Dialogues* for the first time is struck by the fact that Philo is really the hero, and that this was where Hume's sympathy really lay (Gaskin, 1978: 163). Gaskin further notes that even though the *Dialogues* were published after Hume's death, perhaps to protect himself from criticism or harm from religious authorities, Hume was also careful not to offend convention, which partly explains the structure of the work and why it has been so difficult to interpret (Gaskin, 1978: 163). There would appear to be similarities between the *Dialogues* and Cicero's *De Natura Deorum* since Philo may be compared to Cicero's character Cotta according to Price; he noted for instance that 'Philo is a skilful blend of Ciceronian structure and Humean philosophy' (Price, 1964; Gaskin, 1978: 161-162). Historically, the structure of a dialogue allowed personal views to be hidden from direct view, and therefore Gaskin notes that it is not necessary to identify any of the characters with the author, although he comments that it may legitimately be asked who has the sympathy of the author (Gaskin, 1978: 162).

There is some disagreement then over the representation of characters, and Gaskin effectively catalogues the debate, but broadly agrees with Kemp Smith's assessment that Philo represents Hume's view (Gaskin, 1978: 159-162; Kemp Smith, 1947: 58-75, 97-123). Gaskin partly agrees with Mossner's argument that Cleanthes may be identified with Joseph Butler who was an enthusiast for natural theology, writing *The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*, and Demea may be identified with Samuel Clark, a rather rationalistic clergyman who gave a couple of lectures on logical arguments for the knowledge of God in the Robert Boyle science lectures in London in 1704-1705 (Gaskin, 1978: 161-162; Mossner, 1936). But while Gaskin is not fully persuaded by Mossner's case, he does comment that Demea's position typifies the type of argument given by Clark, while Cleanthes typifies the position of Butler, and Gaskin notes that Mossner's case supports the idea that Philo represents Hume's view (Gaskin, 1978: 161). If this is correct then Cleanthes may be seen as simply giving voice to the classic design argument, while Demea gives voice to the more rationalistic arguments for God.

Although Gaskin believes that Philo represents Hume ‘almost entirely,’ he also suggests that Hume’s views appear in Cleanthes ‘in part,’ but in Demea ‘scarcely at all’ (Gaskin, 1978: 162). Mackie though sees Hume’s view in both Cleanthes and Philo, with Hume debating with himself; he notes for instance that some of Cleanthes’ views are developed along Humean lines, although he agrees that it is Philo who really represents the view of Hume (Mackie, 1982: 135). There is then broad agreement between Gaskin, Mackie and Kemp Smith that Philo represents Hume’s view in the main, while Gaskin and Mackie think some of Hume’s views may also be to some extent in Cleanthes’ character. And Demea represents the typical rationalistic, ontological and cosmological arguments of a Samuel Clark and therefore he is generally not thought to represent Hume’s views much at all, although I would suggest that to some small extent some of Hume’s thoughts may have been placed in the argumentation of Demea as well.

It is also the case that Hume was sceptical of inductive reasoning in general. This is shown for instance by Peter Strawson who pointed out that Hume in earlier works was concerned with the question of induction, and how we can be certain of the existence of other bodies or other minds (Strawson, 2000: 33-34). Although Hume was a sceptic he was led to question the effectiveness of absolute scepticism. Strawson commented that Hume believed more widely that ‘all arguments in *support* of the sceptical position are totally inefficacious’ and that ‘all arguments against it are totally idle’ (Strawson: 2000: 36). This then leads to a position where one must start from belief in the existence of other bodies and in other minds in trying to make sense of the world; or as Strawson puts it, we are forced to form ‘beliefs and expectations in general accordance with the basic canons of induction’ because nature necessitates the rejection of absolute scepticism, and the commitment to first believe is really inescapable, whether that is religious belief, belief in other bodies or in other minds, or in expectations that must be based upon inductive reasoning (Strawson, 2000: 36-37). So scepticism has only a subordinate part to play in the way in which we understand the world, although it follows that our beliefs that are founded inductively must subsequently be organised into a consistent pattern in our minds in order for people to remain rational (Strawson, 2000: 37). While Strawson’s argument was primarily philosophical, the inference is that

the methodology of science must accept the foundational place of prior commitment in scientific theory formation.¹¹

A similar path is followed by Alvin Plantinga who set out in further detail the problems of induction (Plantinga, 1993: 122-136), as did Karl Popper who recognised the problems with inductive reasoning in the methodology of science, and this led him to develop the falsification criteria for science (Popper, 2002: 43-72). Plantinga traces his understanding of the problem back to Thomas Reid and to Hume, and identifies it as Hume's 'Old Riddle of Induction.' Reid saw that it is experience that teaches human beings to believe that the future will probably resemble the past, and that this belief is formed in people even from childhood before they have the ability to justify those beliefs with reasoned thought (Reid, 1983: 283; Plantinga, 1993: 122-124). Hume though saw that such inductive inferences, which are formed by experience in this way, are really without a properly justifiable foundation even though experience teaches us that they provide a useful guide to the way we build knowledge about the world. Such 'inductive habits,' Plantinga notes, are extremely useful to human life, but such beliefs cannot be justified with absolute certainty (Plantinga, 1993: 124-126, 136; Hume, 1888: 48; 139).¹² So, we may note that as well as being sceptical of the ability of design proponents to prove their work conclusively, Hume was also sceptical of the ability of inductive reasoning to provide certain knowledge in science.

In light of Hume's *Dialogues* and his wider work then it would seem that he believed that the design argument cannot provide absolutely certain proofs for God, but neither can the design argument be absolutely dismissed along the lines that Philo presents. I would suggest then that Hume's position would be along these lines: *if* the design

¹¹ Fuller notes that Hume was sceptical of the ability of experimental science to provide ultimate knowledge of matter and that he was equally sceptical of secular knowledge as well as sacred knowledge. Hume was criticised by Kant in *Critique of Pure Reason* and only rescued by T.H. Huxley in 1879 in *English Men of Letters* (Fuller, 2008: 114-115; Kant, 1999; Huxley and Morley, 1879).

¹² While Hume believed that there was no solution to the problem, Plantinga offers a solution by asserting that that is how 'properly functioning human beings form beliefs' (Plantinga, 1993: 136). The second problem of induction (or Goodman's 'New Riddle of Induction') Plantinga identifies as being concerned with the question of what it is that makes 'properties projectable?' Again Plantinga offers a similar solution, on the basis that that is how 'properly functioning' human beings project properties (Plantinga, 1993: 128-136). It may be noted though that all inductive inferences will contain an unavoidable personal element of belief.

argument is to be accepted as valid, it will be on the basis of prior belief as Demea's position sets out because evidential Cleanthes' type of arguments are analogical and therefore unable to provide absolute proofs. The same logic applies for those who reject the design argument because inductive scientific reasoning cannot provide absolute certain knowledge, and the Epicurean position must also be accepted on the basis of prior belief. I would argue further that some of Hume's views are to be found in each of the characters, including Demea, and Hume has set out the three main positions on the design question with some clarity, although with Cleanthes and Demea presented as rather extreme polarised positions. Hume's own position is I would suggest somewhere in the middle of the *Dialogue*. I am not suggesting here that Hume was anywhere near as religious as his character Demea, but he may have had some vague theistic, deistic or even pantheistic religious belief, according to which the deity is uninterested, unknowable and impersonal, although his actual religious beliefs remain obscure.

This does though raise questions for the present day Intelligent Design position because approaches that seek to demonstrate the existence of God from evidence in nature will always be incomplete, even if compelling. Instead the Cleanthes type of design argument really requires some form of prior belief, and I believe that proponents need to find ways of building bridges with some of the arguments set out by Demea. A modern proponent for instance of some of Demea's ideas is Plantinga, particularly concerning the place of prior belief in science, and I will discuss how this might help to rescue Intelligent Design arguments in later chapters.

2.2. Is Design a Weak Analogy to Human Intelligence?

2.2.1. Introduction

I now want to turn attention to examining Mackie's first claim against the design argument that he believes is present in Hume's *Dialogues*. This is the claim that it is only a weak or remote analogy to human intelligence. Firstly, though it is necessary to look more closely at the exchange between Mackie and Richard Swinburne, and see whether Swinburne's response in defence of design offers any strong support to Intelligent Design (Swinburne, 1979; 1991; 2003: 105-123; 2004). Following this, further consideration will be given to analogical reasoning and the nature of inductive inferences, particularly the claims of Elliott Sober that the Cleanthes type of position need not be analogical and inductive, but can be framed as abductive as an inference to

the best explanation (Sober, 2003: 27-53; 2007). What I think does come out of the following discussion is that whether the analogy to human intelligence holds true, or is weak or strong, it will remain dependent upon probabilistic reasoning if it is treated as science (whether as induction or abduction), and will thus depend upon one's prior belief. There is also another consideration relating to Intelligent Design that Sober raises, and that is concerned with predictive power (Sober, 2007). This though raises difficulties for Intelligent Design theory in terms of acceptance as science, because in order to undertake Sober's challenge it seems necessary to make prior statements about the designer; statements that appear theological in nature.

2.2.2. Mackie and Swinburne's Dialogue on the Design Argument

Richard Swinburne has attempted to defend the design argument, especially in relation to claims about our knowledge of the origin of worlds, and comments that if Philo's objection to the design argument were accepted it would not be possible to explain humanity through analogical arguments because we too are unique (Swinburne, 1968: 207-8). He argues that the analogical objection to design restricts science in general, and he stresses that distinctive explanations are often required for distinctive phenomena. For Swinburne, though, design is to be found in the temporal order of cause and effect and in the laws of nature, and he considers that Darwinism can better explain the spatial order and machine-like complexity of biological systems (Swinburne, 1979, 1991¹³: 133-151; 2003: 105-123). Although Hume's character Philo claimed that the laws of nature are self-organising, Swinburne agreed with Paley that such an argument is a mistake because science cannot provide ultimate explanations for natural laws and regularities (Swinburne, 1968: 202; Paley, 1997: 31).

In seeking to respond to and defend forms of the teleological design argument, Swinburne first divides design into spatial and temporal order, or what he calls regularities of co-presence, and regularities of succession, and finds the latter a more compelling argument; therefore Hume's criticism of the design argument, through Philo, is not conclusively established (Swinburne, 1991: 133, 135). However, Swinburne allows for the possibility that an argument from spatial order may be valid if design exists in the fine-tuning of the laws of nature; that is regularities that would be necessary for evolution to produce human bodies through a process of generation.

¹³ First published 1979, revised edition 1991, 2nd edition 2004.

Under this scenario nature would be a ‘machine-making machine,’ and because human beings make machines that make other machines, an inference may be made to a creator. This argument though seems to echo Philo (Part VII) where it is asserted by Hume’s character that order has arisen through an impersonal force or pantheistic power of generation. This though really takes away from the idea of personal explanation that Swinburne finds more desirable. However, Swinburne considered this machine making behaviour of nature to be rare in his earlier work, and thus he asserted that it does not provide a strong argument for a rational agent, but merely offers a ‘small degree of probability’ (Swinburne, 1979; 1991: 136).¹⁴

His main focus though is on the temporal order of the universe and he thinks this provides a basis for a stronger argument for the existence of God. The order of the universe in terms of laws of temporal causality is considered to be so prevalent and predictable that this order itself needs an explanation in terms of a divine mind (Swinburne, 1991: 136). As such those who seek to uphold the teleological argument are justified in supposing that such ordered regularities of nature are universal in time and space, and that these regularities exist independently of the human mind (Swinburne, 1991: 137). Such foundational regularities in nature also form the basis for scientific explanations and so they themselves cannot be established by science (Swinburne, 1991: 138-139).¹⁵ From this it follows that either the orderliness of nature is where all explanation must stop, or it must stop in an all-powerful, intelligent and personal agent who brings about such order. Swinburne therefore argues that what is required is a ‘personal explanation,’ as opposed to one which is structured in terms of laws, where an agent is able to bring about a state of affairs intentionally (Swinburne, 1991:293) Therefore he argues that a universe with a degree of order is at least somewhat likely given the existence of a designer, but not at all likely otherwise, and concludes that the existence of order in the universe makes the existence of God more probable than it otherwise would be (Swinburne, 1991: 142-148). A unified single God is also the more simple explanation for the orderliness that exists throughout the universe than a multiplicity of gods or divine agents (Swinburne, 1991: 140-2). And by

¹⁴ Swinburne addresses the question of the fine-tuning of laws of nature more fully in Appendix B of the 1991 revised edition (Swinburne, 1991: 300-322) where he comments that he previously had underestimated the fine-tuning argument because he had not taken into account sufficiently the fact that laws and boundary conditions had to lie within very close parameters for life to have formed at all (Swinburne, 1991: 303; 2003: 105-123; 2004).

¹⁵ This is formulated differently in the 2nd edition (Swinburne, 2004).

placing design in the orderliness of nature in this way, he believes that he has carefully avoided the god-of-the-gaps problem.

The basis of Swinburne's argument for temporal order is inductive and based upon Bayesian probability, and he accepts that all inductive inferences can be represented as arguments from analogy (Swinburne, 1991: 148-150). Swinburne thus sees the temporal order in the universe as analogous to the order that people produce through intention, but on a greater scale. There are therefore similarities and dissimilarities in effects that are evident for a rational agent to investigate through inductive reasoning (Swinburne 1991:149). Swinburne asserts that there is striking evidence of conformity to patterns in both nature and human artefacts and concludes that although remaining dissimilarities do not allow the design argument to be framed adequately as a P inductive argument, design remains a good C inductive argument, commenting that 'The existence of temporal order in the universe increases significantly the probability that there is a God [C Inductive], even if it does not by itself render it probable [P Inductive]' (Swinburne, 1991: 150). So Swinburne's approach is inductive and probabilistic being focussed upon temporal order as opposed to spatial order.

Mackie though offers essentially three objections to Swinburne's position. His first argument against Swinburne is a criticism of the claim that it is a simpler explanation that a deity has brought about order in the universe directly. Instead Mackie claims that given our experience it is a simpler explanation that agents bring about effects indirectly through complex bodily systems. Thus human beings have no background knowledge of agents who bring about states of affairs without use of 'physical or causal mediation,' and without 'materials or instruments.' Mackie comments further that; 'All our knowledge of intention-fulfilment is of *embodied* intentions being fulfilled *indirectly* by way of bodily changes and movements which are *causally* related to the intended result, and where the ability thus to fulfil intentions itself has a *causal* history...' (Mackie, 1982: 100). Swinburne responds by claiming that Mackie has not taken his approach seriously, which is to start without factual background information so as to assess the probability of divine agency through an appeal to simplicity as an *a priori* measure of probability (Swinburne, 1991: 294). For Swinburne the simplicity of the hypothesis is not based on experience in the real world, although factual observations can be fed in later; rather a direct relation between personal intention and its realisation is the simpler

one, and those who seek simple explanations should not complicate an explanation unless it is necessary to do so to account for the data (Swinburne, 1991: 294-296).

Arguments about simplicity are perhaps rather vague and appear subjective and qualitative without having some means of quantification. Arguments about physical causality and intentional causality are also positions that exist at different levels. So for instance, if we discuss why snooker balls are potted in holes in a game of snooker we may offer physical arguments based upon angles, shape, speed, spin, momentum and direction, or we may bring in the mental thought processes and skill of the snooker player who holds and directs the cue. In a game of snooker it is extremely unlikely that the balls would pot in a specific order without the action of an intelligent agent, even though the balls are potted indirectly through the movement of a physical cue. I do though see no reason why an intention from an embodied agent is really a simpler explanation than a disembodied one when considering spatial order. Even with embodied agents we must accept evidence for the presence of mind in terms of the effects produced, as we cannot see minds directly (i.e. balls potted in holes sequentially point to the action of a mind even if potted indirectly). It may be closer to our experience to appeal to embodied agency than disembodied agency, but that does not really affect simplicity, because both equally involve intelligent agency. And if we consider temporal order and the fine-tuning of laws of nature then an embodied agent would be an inadequate explanation for the origin of worlds because embodied agents must act within space and time and depend upon those natural laws for their existence. In this case the embodied explanation would be inadequate. So I believe then that explanations involving intention are equally simple whether disembodied or embodied, even though embodied explanations are closer to our experience, but that for the origin of worlds involving fine-tuning of laws of nature and the dependency of embodied agents upon those laws, the line of reasoning forces us to prefer disembodied agency over embodied agency. But explanations involving personal agency are really simpler when considering highly ordered systems, rather than some random impersonal mechanism. Personal explanation is also one that is comprehensible and within the range of human experience (Swinburne, 1991: 296-297).

Mackie's second objection is the belief that Swinburne needs to 'postulate particularities in God, to explain his choice of the particular universe he decided to create' (Mackie, 1982: 100). In other words Swinburne, according to Mackie, needs to

explain certain characteristics of the deity that have led to the current universe, as otherwise the design explanation is not really explanatory. In response to this claim Swinburne offers some particularities from Christian theology and thinks that an omnipotent, omniscient, and free agent is the more simple explanation, and one who is able to bring about a particular state of affairs as a personal choice out of a number of possible choices. Because such a God would be perfectly rational, and therefore good, his choice must also be equally good (Swinburne, 1991: 111, 297). I think then that Mackie does here make a valid point that in order to make sense of the design argument the proponent must make at least some prior commitments and beliefs about the designer, and I believe that such commitments may arise from theistic belief. But equally those who reject the design argument must make some prior commitments as well. This is shown with Hume's wider philosophy relating to the problem of induction, where Hume believed that nature forces us all to first believe in some propositions.

Mackie, in his third objection, is further critical of Swinburne's assertion that the temporal order of the universe is more probable if there is a God than if there is not on the basis that there should be a strong presumption for randomness in a purely natural universe. Mackie is critical of Swinburne's inductive extrapolation that regularities are universal throughout the universe arguing that this is contrary to the presumption of randomness that Swinburne is starting from. Mackie argues that such an assumption would not hold given an *a priori* assumption of randomness. Mackie suggests that order can arise locally out of disorder, as it is known for instance that random events sometimes throw up regularities such as a sequence of coin toss giving rise to a series of heads or tails (Mackie, 1982: 148-149). Swinburne responds to Mackie's third criticism by commenting that he has not understood his line of argument. Swinburne asserts that he does indeed start from the presumption of randomness if there is absence of a deity, but that limited order appears to us through observation, for instance in the regularities of electrons and protons, which he argues is *a priori* very unlikely. Thus when it is observed that there is local order it is then reasonable to extrapolate such order across the universe. It is further a more simple explanation to postulate that such order arises by the intention of a personal agent than to argue that order might arise through various coincidences in a random manner (Swinburne, 1991: 297-299). Mackie's third point is less convincing because a highly ordered universe that is fit for life is I would argue explained more simply by reference to an intelligent agent rather than being attributed to purely random happenings. As a general rule, it is closer to our experience that

intelligent agents bring about order rather than random events, although it may also be noted from our experience that some limited order, such as the structure of crystals, does arise through the regularities of physical processes, but this may be ascribed to indirect agency as discussed.

Sadly, Mackie offered no further response to Swinburne due to his early death, but I think the short dialogue between Mackie and Swinburne here is not entirely conclusive. Out of this a number of further comments are necessary. Although Swinburne seeks to defend the type of design argument that Cleanthes makes, he does so rather weakly, appealing in the main to temporal order as opposed to spatial order. In this regard his views offer little support to the modern Intelligent Design arguments that are mainly interested in offering design explanations for the spatial order in biological structures; for instance Behe's claim for irreducible complexity. Where Swinburne does consider spatial order as design evidence, it is in terms of fine-tuning arguments, and this correlates more closely with the type of design argument that McGrath seeks to address (McGrath, 2008; 2009). Where there may be some support for Intelligent Design is in a shared belief that order ultimately requires an explanation in terms of personal, intelligent agency that is able to act volitionally, as opposed to impersonal explanations involving physical causality. Swinburne's position is that the design argument must remain a probabilistic one as opposed to offering an absolute proof, and from this argues for a C inductive position where he believes that the temporal order in the universe raises the probability that there is a God. This he believes is justified scientifically on the basis of probability and follows the Bayesian approach, and as noted Swinburne sees no reason why analogical arguments cannot be treated as inductive inferences.

2.2.3. Is the Design Argument Inductive of Abductive?

While Swinburne considered it acceptable to use analogical reasoning as an inductive inference to support the temporal order in the universe, the design argument may be formulated in a slightly different way. Although I think there may still be a place for analogical reasoning as part of a theological discussion, there is an alternative that needs to be considered now. Elliot Sober instead points out that the design argument of Hume's character Cleanthes need not be dismissed as a weak analogy, but that it is really in the form of abduction as an inference to the best explanation. While Sober

recognises that most philosophers and biologists believe that either Hume or Darwin have effectively dismissed the design hypothesis completely, Sober in fact takes a different approach and believes that neither Hume nor Darwin's objections need prove conclusively fatal to the organismic design hypothesis if it can be formulated differently and shown to provide a better explanation (Sober, 2003: 27-54). This becomes more evident when it is noted that Darwin's own arguments in *The Origin of Species* were formulated in terms of an inference to the best explanation as well, as McGrath for instance explains (McGrath 2009:48-49). Both McGrath and Sober believe that the design arguments were undermined when the naturalistic Darwinian explanations seemed to provide the better explanation. They believe therefore that it was Darwin rather than Hume who more effectively challenged the classical design argument by providing the better explanation instead of the problem being weakness of analogical reasoning (Sober, 1993:34-35).

Sober's philosophical objection to the modern Intelligent Design arguments is based on the apparent reluctance of proponents to submit to falsification, but he does believe that if this can be undertaken then it would be acceptable to at least consider the spatial order of biological structures as evidence of design in a scientific sense. Sober then has pointed out that the design argument need not be based solely on analogical reasoning and can instead be based on an inference to the best explanation under, what he terms, the *likelihood principle*.¹⁶ So how does this work? In terms of Paley's watchmaker argument, it may be observed that a watch has certain features that support the hypothesis that design is a more likely explanation than chance. In the same way the vertebrate eye has features that support the design hypothesis over the chance hypothesis. This inferential approach is set out as follows.

(W) O_1 : the watch has features $G_1 \dots G_n$.

W_1 : the watch was created by an intelligent designer.

W_2 : the watch was produced by a mindless chance process.

From this Sober stated that 'Paley's idea is that O_1 would be unsurprising if W_1 were true, but would be very surprising if W_2 were true' (Sober, 2003: 28). The likelihood principle suggests that observation O supports the first hypothesis (H_1), over the second

¹⁶ In effect, the main difference between Sober's position and Swinburne's approach would seem to be concerned with Swinburne's willingness to use an a priori measure of prior probability.

(H₂), because $\Pr(O|H_1) > \Pr(O|H_2)$, and accordingly Paley's line of reasoning simply applies in the same way to living organisms (Sober, 2003: 29). There are then two premises to the likelihood version of the design hypothesis; the probability of O given chance is low, and the probability of O given design is higher. But within such a scheme it is necessary for both side of the argument to make predictions that are potentially falsifiable so that a comparative analysis can be conducted.

From this it may be noted that Intelligent Design theory may potentially be justified in terms of an inference to the best explanation, but Sober here notes that another problem arises for the design hypothesis. This problem is concerned with the ability of Intelligent Design proponents to specify in advance how the designer would go about designing and making things; for instance the human eye. In order to do this it is necessary to specify in advance characteristics of the designer, but such statements would be based upon theological premises. Using the Search for Extraterrestrial Life (SETI) work as an example, Sober comments that the researchers must make assumptions about what constitutes intelligent life, and the type of signal any extraterrestrial life might send, or be able to read, and that such assumptions are very fallible (Sober, 2003: 40-41). In the same way the assumption that a divine designer would have chosen to design the human eye with the present features is fallible, as it is not possible to know the mind of the designer in advance. Sober believes then that in order for competing hypotheses to be studied effectively there is a need for both to make predictions and to be studied comparatively. And I think Sober is right to suggest that this is a point that the design hypothesis needs to address (Sober, 2003: 42-43; 2007). However, Sober notes that the organismic design argument cannot be excluded completely on the basis of the likelihood principle, and that some day it may be formulated with independently supported auxiliary assumptions (Sober, 1993: 52). So, this presents a further challenge to the Intelligent Design arguments that I want to begin to look at now; that is how the arguments for design might make predictions and be submitted to a process of falsification. I will offer some initial thoughts here and return to the broader question of design, scientific methodology and explanatory power in the next chapter.

2.2.4. Prediction or Accommodation?

Steve Meyer raises an important point in noting that abductive inferences are often focused more upon historical questions, whereas inductive inferences are more useful in the present time or consideration of future events. Abduction can in fact be traced back to the nineteenth century with William Whewell and Charles Sanders Peirce. Whewell divided science into operational science that seeks to discover universal laws from present studies in nature, and the historical sciences. Historical science, as Whewell understood it, has as its objective the desire to discover ancient causes or conditions and to explain the ‘manifest effects’ observed in the present by reference to historical events, as opposed to appealing to direct general laws in the present. From this, the historical sciences seek to reconstruct past conditions by working backwards using inferential reasoning (Whewell, 1847; Meyer, 2009: 152-153). Peirce believed the abductive approach differs from both induction and deduction in that it seeks to build up knowledge of past or unseen events by working backwards from present observations and beliefs. With historical sciences though, judgments relating to explanatory power can be conducted through an analysis of past events and causal pathways, instead of finding it necessary to predict future events through present experimentation, as happens with an inductive approach (Lipton, 1991; Meyer, 2009: 156).¹⁷

So, instead of working with predictions, there is instead the possibility with abductive reasoning of accommodating existing data into a coherent pattern, and Sober (with Christopher Hitchcock) too has recognised that sometimes accommodation can be preferable to prediction (Hitchcock and Sober, 2004). From this, I would suggest that Intelligent Design may be justified if it can accommodate existing data in such a way, and McGrath offers some support suggesting that natural theology is at least in good company with the way some sciences are developed (McGrath, 2009: 59-60). However, McGrath’s approach differs from Intelligent Design arguments in that he wishes to

¹⁷ Peirce also saw there was a gradation in how strongly abductive inferences can be held. For instance we can believe in the existence of an historical figure such as Napoleon from present evidence with a high degree of confidence, but other abductive inferences are held less strongly. Peirce believed that an abductive hypothesis should be accepted if an explanation is the best or only conceivable explanation (Peirce, 1931: 372-88; Meyer, 2009: 153-156). It is this type of reasoning that Peter Lipton developed into the ‘inference to the best explanation’ and he saw that working scientists often judge competing explanations in terms of their explanatory power (Lipton, 1991).

develop his ideas within Trinitarian Christian theology, whereas Intelligent Design proponents seek to avoid making direct theistic commitments. But the general point is I think that Intelligent Design arguments may potentially be developed to accommodate the data into a coherent pattern and they may not need to make predictions in order to be justified as science.

The difficulty though with this for Intelligent Design theory is that the work of specifying characteristics of the designer in advance in order to accommodate data into a coherent pattern faces the same problem that prediction faces; that is the need in science to begin with core commitments. I will discuss this at greater length in the next chapter through the work of Kuhn and Lakatos, and Alvin Plantinga's arguments for Augustinian science. But for the Intelligent Design argument core commitments appear to move from the scientific arena to the religious sphere, and this is contrary to the approach the Intelligent Design theorists wish to pursue. Instead the work of accommodation, that might allow Intelligent Design to be considered good science, necessitates the relationship between science and faith to be one of integration or overlap, as a distinctly separatist approach I believe fails. This means that the possibility of developing Intelligent Design within naturalistic or secular science, and so avoiding theistic considerations as proponents wish, does raise problems for Intelligent Design; this because proponents cannot then specify in advance particularities of the designer.

2.2.5. Intelligent Design, and Analogical Reasoning

I want now begin to look at the question of prior theological commitments that might allow Intelligent Design a place within a theistically informed approach to science. The first consideration here is to look at the functionality and strength of analogical reasoning. As discussed already, Hume placed the idea that there may be a natural awareness of divinity, where people may feel the truth of religion, in Demea's speech, and this was separated from Cleanthes' analogical reasoning to human intelligence; a form of reasoning that arises out of a belief that human beings are created in God's image. Hume seems to have considered it weak or remote. Within Christian theology the appropriateness of analogical reasoning arises because God is believed to have created all things, and that human beings are created in the image of the creator God. Out of this, creation may reflect something of the divine craftsmanship and the designer, and also that human beings have some capacity to perceive that design through the

senses and reason, whether dimly or strongly (Brunner, 1981: 345; McGrath, 2008: 187-188). This understanding, that creation is ordered by God to be intelligible, seems to be present in Augustine's thinking; he commented for instance that 'God fashioned the sensible things of this world to permit them to signify himself,'¹⁸ although there is the possibility of interpreting this symbolically. But it also reflects a belief that marks or footprints of God may remain in the created order; Augustine saw this in the context of the *vestigia Trinitatis*, (in *De Trinitate*), particularly in relation to the love of learning through the human mind, and it has a revelatory purpose.¹⁹

Within Augustine's theology there is also the notion of an innate sense of divinity, or *sensus Divinitatis*, that is understood within the context of humanity created in the image of God (McGrath, 2008: 190-198). For Augustine, part of that image is the presence of a rational and intellectual capacity that allows human beings to discern something of God from the created order because it is created through divine reason,²⁰ but there is also I think an emotional and relational aspect within Augustine's sense of divinity that corresponds in part to the position of Demea. Augustine wrote for instance that the 'rational or intellectual soul of humanity' exists because we are created in God's image 'in order that it may use reason and intellect in order to apprehend and behold God.'²¹ Furthermore, Augustine believed it necessary for the Church (through the sacraments, exhortation and preaching) to 'heal the eyes of the heart so that God might be seen.'²² So, for Augustine the sense of divinity, that arises because we bear God's image, includes an intellectual and rational sense, but it goes further to include emotional and relational aspects as well. I would suggest also that there is a volitional capacity, and McGrath points out that for Augustine this doctrine was embedded within

¹⁸ Augustine, *De Trinitate*, III. iv. 10, as paraphrased by McGrath (2008: 188).

¹⁹ Augustine, *De Trinitate*, XI, i. 'No one doubts that, as the inner man is endued with understanding, so is the outer with bodily sense. Let us try, then, if we can, to discover in this outer man also, some trace, however slight, of the Trinity.'

²⁰ Torrance points out that a similar understanding was held by Athanasius of Alexandria (for instance in *De Incarnatione Verbi*) where human beings are seen created in the image of God. In this, both human reason and the order of creation are believed to have arisen through the divine Logos, with the intention that something of God might be seen through creation because it is an expression of divine reason. There is then a unity of knowledge between the natural and supernatural, and this reaches its fulfilment in the incarnation of Christ who was the perfect image and Logos of God (Torrance, 1980c; McGrath, 2008: 78, 191).

²¹ Augustine, *De Trinitate*, XIV, iv.6

²² Augustine, *Sermo* 88, 5.

an understanding of grace, incarnation and redemption (McGrath, 2008: 198).²³ So, whereas Hume seems to have divided the sense of divinity from analogical reasoning between Demea and Cleanthes, the Augustinian position in effect holds them together.

A prior belief that God may reveal himself through the doctrine of the *imago Dei* then provides a counter to Hume's claim (through Philo and Demea) that the analogy to human intelligence is anthropomorphic. It is not then a case of us, as human beings, making God in our own image, but of God making human persons in his image and then self-revealing in a manner that can be understood through analogical reasoning. As a result some of God's attributes may then be understood through the intellect. If this doctrine is brought to bear upon the design question then we would expect there to be some resonance between the theological belief, and reason and evidence gathered through the senses and how we understand ourselves. Even if this does not prove God's existence scientifically it does provide intellectual, emotional and relational satisfaction because of coherence with our very being as divine image bearers. This understanding, through the use of analogy, is however grounded in theological doctrines.²⁴

There is, however, a further question about the strength of analogical reasoning and how we are to understand the concept. There is within analogical reasoning a comparison that moves from a prior sense to a posterior sense, and within this is a degree of similarity, but also a degree of difference. Analogy may then be seen in ambiguous terms, but that need not be so. Duns Scotus was concerned that equivocal language about God through negative theology or *via negativa* (as exemplified for instance in Demea's speech) was moving towards scepticism and the undermining of Christian doctrines. Instead, Scotus emphasised the univocal and literal nature of language concerning God where such concepts differ only in scale and not kind (especially relating to *being*; for Scotus it was a unified and univocal approach to the concept of

²³ J.P. Moreland also considers that the doctrine of the *imago Dei* presents 'recalcitrant facts' to a naturalistic framework and other worldviews, but one that sits much better within a theistic, particularly Christian approach, to understanding the world. Recalcitrant facts that stem from the *imago Dei* doctrine, Moreland posits, are 'consciousness, free will, rationality, the self, intrinsic value and equal rights/dignity, the reality and nature of human meaning and flourishing' (Moreland, 2009: 5).

²⁴ Interestingly, some Intelligent Design proponents, such as John Lennox, have suggested that as a result of developments and discoveries in biological science analogical arguments may be strengthened because it is believed that biological structures do in fact very closely resemble human machines (Lennox, 2007: 82-87).

being that made theology possible). For instance there must be a direct equivalence between God's love and human love for the concept of God's love to retain a coherent meaning for people, even though God's love is perfect and ours is not (Williams, 2010; Ashworth, 2009; Fuller, 2008: 60, 77). Aquinas' approach was not that dissimilar to Scotus, and there is a sense that for Aquinas analogy remained a literal mode of discourse that was concerned with the relationship as well as the difference between the prior and posterior sense.²⁵ He was seemingly more concerned with language about God without necessarily questioning ontological commitments (Brown, 1968: 3-32; Deely, 2002: 251). Aquinas, however, saw his approach as a bridge between the equivocal *via negativa* and the univocal understanding of Scotus, but the difference perhaps comes down to semantics. Scotus noted that there might be a difference in scale even with univocal language relating to kind; Aquinas highlighted relationships and differences through analogy.

But through analogical reasoning, and the doctrine of mankind created in God's image, there may be coherence or resonance between human intelligence and our understanding of the wisdom of God, as McGrath for instance seems to suggest (McGrath 2009: 34). Use of analogies to human intelligence may offer some support to Intelligent Design theory even though it would then find a basis in theological commitments. If so, then Hume and Mackie's objection to design on the basis of being only a weak analogy does not hold. Analogies express similarities as well as difference, and they do not need to be exact to be useful, and such differences may be in terms of scale and not kind.

Summary

In this chapter I have begun to consider the Intelligent Design arguments in light of Hume's *Dialogues* and a number of identified objections to design as outlined by Mackie have been identified. I began by analysing the *Dialogues* and highlighting the different positions and how the debate is shaped. It was noted for instance that although there are three characters in the *Dialogues* there are four identifiable positions. I then looked at the first objection to the design argument that Mackie considered important; that is that it is only be a remote analogy to human intelligence.

²⁵ Aquinas, *Summa Theologiae*, 1a. Q. 13.

In the first instance, I traced further dialogue through Mackie and Swinburne and noted that Swinburne has made a useful contribution to the wider design debate, but one that is not directly relevant to the Intelligent Design arguments because proponents are mainly interested in spatial order in biological structures as opposed to Swinburne's argument for temporal order. Although I believe analogical reasoning need not be merely weak or remote, it was further noted that it is possible to formulate the design argument in terms of an inference to the best explanation. This offers some benefit over analogical reasoning, but it remains probabilistic and requires a measure of prior belief in terms of foundational commitments. So, there is an unavoidable theological commitment in the design argument for it to be grounded properly. If the design argument is grounded by belief in this way then Christian doctrines can be brought in at the start. One such doctrine is that of the *imago Dei* which can resist the objection of anthropomorphism if it is established as a prior belief that God self-reveals. From this it may be possible to move beyond weak analogies through univocal language.

I believe that Intelligent Design arguments can make a useful contribution within a theistic science if framed properly with recognition of foundational religious beliefs, but a purely evidential approach will always remain probabilistic however strongly it is framed. Whether we use inductive inferences or abductive inferences does not solve the problem, even though both approaches may have a degree of validity, and attempts to prove absolutely the existence of God through science will always fail for these reasons. Proponents of Intelligent Design should I believe recognise that their work is involved with and supported by religious commitments, but this is really moving away from naturalistic approaches to science. I will return to discuss these more theological aspects in the theology chapter.

3. Intelligent Design, Scientific Methodology and Research Programmes

In the previous chapter the structure and narrative of Hume's *Dialogues* was examined, and then Mackie's first Humean objection to the design argument was considered in depth. This objection was concerned with analogies to human intelligence, with the claim that such analogical reasoning provides only weak support to the design argument. I offered two ways forward; the first was concerned with inferences to the best explanation. This led on, through the thinking of Sober, to considerations of predictive power in science (Sober, 2007). It was noted that the dilemma for Intelligent Design theory is that for it to become predictive it is necessary to make prior commitments, but these may look very much like theistic statements; statements that proponents are reluctant to make. Sober's claim against Intelligent Design is that predictive ability ought to provide a marker for science, and this mirrors the last of Mackie's objections to the design argument; that it can have no explanatory power and thus should not be considered good science (Mackie, 1982: 136-137). In response, I suggested that a possible way forward is to accept that it may be necessary to allow prior theological beliefs a place in the foundations of science within an interactive or overlapping approach to the science-faith interface. The second way forward was to look again at the nature of analogical reasoning.

However, this raises another difficulty for Intelligent Design. The claim of Michael Ruse is that for an argument to be considered good science it must follow the rules of methodological naturalism, which would automatically exclude theological beliefs and doctrines from science, and therefore any notion of a divine designer. Ruse has been one of the main proponents of methodological naturalism for some thirty years (Ruse, 1982). At its most simple this position holds that science must be conducted on the basis that nature ought to be explained solely by appeals to natural forces and to material factors, without recourse to supernatural agency. Even if there is a reality beyond the material world science has no way of discovering it. It is therefore not necessarily atheistic, and perhaps a majority of theists in the science-religion academic arena accept it. But it effectively excludes Intelligent Design from science by definition of what science is and is not. However, a number of Christian philosophers, such as Alvin Plantinga, have been critical of methodological naturalism because of a perceived clash with Christian faith. I will consider Plantinga's arguments for Augustinian or theistic

science in response to Ruse's position in the first section of this chapter and see whether it helps rescue Intelligent Design as good science (Plantinga, 2001: 339-359).

The framework of scientific methodology is also related to questions about explanatory power, and the development of scientific research programmes as a whole.²⁶ Imre Lakatos argued for method in science where core commitments may be held dogmatically, whereas Paul Feyerabend opposed the idea that there could be one unified scientific methodology, or *methodological monism*, because such dogmatism would reduce science to absurdity and restrict discovery; thus preventing scientific progress. The concern of Lakatos was that Feyerabend's position would lead to relativism and so undermine science. I will consider briefly how this impacts upon the positions of Ruse and Plantinga in the first section, then return to examine the question of scientific research programmes in the second section in greater depth and what it might mean for Intelligent Design. What will become apparent I think in support of Augustinian science are the Augustinian influences that exist in the development of research programmes, particularly from the work of Polanyi and also in Lakatos.

3.1. Intelligent Design and Scientific Methodology

3.1.1. Ruse's Arguments for Methodological Naturalism

Ruse has developed specific naturalistic criteria for the methodology of science that exclude by definition all appeals to supernatural agency in science and therefore by default the Intelligent Design arguments. According to Fuller, Ruse was partly responsible for the reintroduction of clear demarcation criteria into science through his testimony at the *McLean vs Arkansas Board of Education (1982)* American court case (Fuller, 2007: 93-94). Judge Overton accepted Ruse's testimony on scientific methodology with the demarcation criteria broadly set out as follows:

1. It is guided by natural law
2. It has to be explanatory by reference to natural law
3. It is testable against the empirical world
4. Its conclusions are tentative

²⁶ The dialogue between Imre Lakatos and Paul Feyerabend being an example as outlined in *For and Against Method* (Lakatos and Feyerabend, 1999).

5. It is falsifiable

The above legal judgement reflected Ruse's thinking in 1982 (Johnson, 1994: 112); Ruse further wrote in that year that science by definition 'deals only with the natural, the repeatable, that which is governed by law' (Ruse, 1982: 322). The five points above I would suggest fall into two categories; that good science must be explanatory by reference to natural laws; and that it must be tested through the most appropriate process of verification or falsification as a truth seeking exercise. Ruse though later offered a modified list of criteria that methodological naturalism entails the following beliefs:

1. The world runs according to unbroken natural law
2. That humans can comprehend the world in terms of that law
3. That science needs no explanation involving supernatural forces or agents such as God (Ruse 2001: 365).

Ruse places much less emphasis on a valid process of falsification in this latter list of criteria, but the third clause here would exclude religious or supernatural explanations *a priori*. Ruse though argued that any form of scientific study that seeks to include the concept of miracles could not be part of science by definition because of the violation of the above criteria (Ruse, 1982: 322). Ruse's conception of methodological naturalism allows only appeals to naturalistic explanations in science. Ruse though comments that this should not be seen as being atheistic, but allows for forms of religious belief that do not interfere with scientific investigation. Instead, he asserts that the scientist working according to methodological naturalism must assume that the natural order is governed by unbroken natural laws, and that human beings are able to access those natural laws through scientific investigation without invoking supernatural explanations (Ruse, 2001: 365). Although Ruse's formulation of methodological naturalism does not deny the possibility of God's existence, it does by definition exclude appeals to religious or theological authority in science, and according to Ruse it 'denies God a role in the creation' (Ruse, 2001: 365). So discussions about God's activity lie outside of scientific investigation (Ruse, 2001: 365).

A number of theologians broadly accept this position. Howard Van Till has adopted a similar approach to the methodology of science, but writing from a theistic perspective he does not like the term methodological naturalism. He argues instead that the whole of

creation must be characterised by the concept of ‘functional integrity’ if theistic believers doing science are to remain true to Christian theology and true to science, and thus they must respect the inviolability of natural laws and processes. The created order can thus have no ‘functional deficiencies, no gaps in its economy’ of the type that would allow God to act in time and space, either immediately or temporarily (Van Till, 2001: 158). Otherwise, Van Till argues, God would be turned into a creature or a component of nature, and thus be reduced to a subject for scientific investigation. John Stek, Diogenes Allen and John Haught have adopted similar views (Stek, 1990; Allen, 1989; Haught, 2004: 231).²⁷

3.1.2. Plantinga’s Response to Ruse

Plantinga, however, is more critical of the necessity for methodological naturalism in science and believes that the world and Christian faith are caught up in a spiritually based struggle. This he derives from Augustine’s view of human history that is seen in the context of a struggle between the City of God (*De Civitas Dei*), and the City of the World (Plantinga, 1996: 177-211; 1997; 2001: 339-340). Plantinga notes as well that Tertullian was one of the first post-apostolic theologians to argue that scholarship, or any form of intellectual activity, cannot be religiously neutral, but is bound to be moulded by prior worldview commitments. There is also an acknowledgement in Plantinga’s paper to the Dutch neo-Calvinism of Abraham Kuyper (Plantinga, 2001: 359).²⁸ Kuyper argued that Christian faith and doctrine, especially Calvinism, encompassed every sphere of life including politics, economics, culture, science and the arts, and therefore all schools of thought, including the intellectual and scientific arenas, are areas that Christians must engage in as Christians (Bratt, 1984: 17). Kuyper’s concern in attempting to redirect Calvinism in Holland was that the practices of the Reformed community were becoming increasingly withdrawn from public life. He therefore sought the reinvigoration of faith and argued that Christian belief must make a difference in all areas of society and culture, including science. From this there was strong criticism of the type of pietistic dualism that separated private worship and

²⁷ Haught asserts that, by the very nature of science, appeals to supernatural explanations must be excluded, and suggests that Intelligent Design proponents unnecessarily confuse methodological naturalism with metaphysical naturalism (Haught, 2004: 231).

²⁸ Plantinga is one of a number of Reformed theologians and philosophers who have been influenced by Kuyper’s theological work. Another proponent is Nicolas Wolterstorff (1983; 1986). Kuyper’s thinking was developed from 1870 until his death in 1920.

religious devotion from public life. Instead, he believed that personal salvation must be set in the context of creation where redemption is seen as being the beginning of a process of restoration of the world (Bratt, 1984: 16).²⁹

Plantinga follows Kuyper's appeal and believes that science plays a very important role in the life of people in the western world. As such Christians should engage positively with the world, but in a way that respects Christian beliefs. Science has undoubtedly provided enormous benefit in terms of, for instance, engineering science and the fight against diseases. However, it has also shaped the intellectual environment considerably, and Plantinga is right I think to argue that it would be naïve to consider that it has not also been caught up in the struggle of worldviews described by Augustine and Kuyper. Therefore Plantinga rejects the idea that science can always be a religiously neutral process of investigation (Plantinga, 2001: 339-340). While conceding that some parts of science may approximate to religious neutrality he suggests that others are more closely caught up in the struggle between the divine and worldly cities. Although there is no clear line of demarcation to distinguish where that boundary lies between religiously neutral science, and religious worldview shaped science, as a 'rule of thumb' he proposes that science is shaped more clearly by worldview beliefs in those areas that seek to understand humanity (Plantinga, 2001: 340, 343-344). He further asserts that methodological naturalism is really 'provisional atheism' because it excludes religious explanations by definition (Plantinga, 2001: 340-341), but I think he has really overstated the case here.³⁰ There is no reason why theists cannot do science according to the rules of methodological naturalism without embracing atheism, but the main problem I would suggest is along the lines of Kuyper's point and concerns whether a dualistic approach to science and faith, one that separates the study of the material world from theology, really suits the needs of the Christian community. It is really then

²⁹ Kuyper in *Lectures on Calvinism* wrote 'The world after the fall is no lost planet...humanity is no aimless mass of people which only serves the purpose of giving birth to the elect. ... The world...is the theatre for the mighty works of God, and humanity remains a creation of His hand, which, apart from salvation, completes under this present dispensation here on earth, a mighty process, and in its historical development is to glorify the name of Almighty God.' (Bratt, 1984: 16).

³⁰ Wolfhart Pannenberg also writes that the insistence that science should be conducted without reference to God as Creator doesn't fully respect Christian doctrine, and believes that the 'methodological atheism of modern science' is not an impartial party in shaping our understanding of the world. Instead, if God is truly the Creator, then science cannot progress with integrity and fully understand the creation without taking that on board (Pannenberg, 1981: 4).

about whether science and faith must be isolated from another, or whether there is the possibility for meaningful dialogue and overlap.

The idea of methodological naturalism has arisen from an Enlightenment ideal that science should be a dispassionate evidential and rational search for truth that is set apart from religious beliefs. Seen in this light methodological naturalism is a development out of the rationalistic foundationalism of Descartes and Locke, and Plantinga is strongly critical of this position. He writes that for the classical foundationalist ‘a belief is properly basic...if and only if it is either *self-evident*...or *immediately about* [one’s] *experience*...’ He rightly observes though that this position does not meet its own criteria for justification, and that if it were accepted very few of our beliefs would be warranted (Plantinga, 1993: 182-183; 2001: 342-343, 359). Instead, Plantinga notes, we should include other beliefs in the foundations of knowledge claims; these include ‘perceptual beliefs, memory beliefs, beliefs about the mental states of other persons, inductive beliefs, and testimonial beliefs,’ and following Augustine and Calvin he argues that it is also reasonable for a theist to accept that ‘belief in God can also be properly basic’ (Plantinga, 1993: 182-183).³¹ A further theme is that beliefs are warranted when our cognitive faculties are working properly within the correct environment and according to a ‘design plan’ that is aimed at producing true beliefs (Plantinga, 1993: 184, 194-215). So, for Plantinga belief in God, or a divine designer, can be held without requiring justification from other beliefs, and that a theist can hold these beliefs even in the foundations of science.

3.1.3. Where Might Augustinian Science be Appropriate?

I believe then that Intelligent Design may be rescued as science if held within an Augustinian approach. However, it is not evident that Plantinga had Intelligent Design directly in mind as the reason for formulating Augustinian science, although there is some coherence between the two. For Plantinga, the main example where Augustinian science is likely to be most appropriate is in those areas that are concerned with understanding humanity. In order to properly understand human beings within the Christian scientific and academic community he argues that it is necessary to begin science from ‘what we know as Christians’ (Plantinga, 2001: 340). This would include

³¹ This position is labelled ‘Reidian Foundationalism’ from the philosophy of Thomas Reid (Plantinga, 1993: 65-88, 89-101, 182-183).

an understanding of humanity in a holistic sense that takes full account of the spiritual as well as the physical characteristics of people as beings created in the image of God.

There are I believe some related areas where Augustinian science might be appropriate. One area is in examining claims for miracles and spiritual healing as a response to prayer. Polkinghorne acknowledges that there are continued reports of miraculous healings in the Christian community and that these reports cannot simply be dismissed because of prior beliefs that such things cannot happen. Hume was resolutely opposed to miracles because they were seen as violations of the laws of nature, but Polkinghorne finds Hume's absolute position on miracles and his belief in the inviolability of natural laws to be inconsistent with his strong criticism of the inductive method. Polkinghorne points out that laws of nature are not known with such absolute certainty that the possibility of miracles and divine healings can be dismissed completely (Polkinghorne, 1989: 54-55). Hume believed that for miracles to be accepted there must be evaluation by a great body of men, with 'unquestioned good sense, education and learning,' so as to 'secure against all delusion'³², but in reality Polkinghorne observes that he was really an 'absolutist' and an 'intransigent sceptic' who could never accept any evidence for miracles however well tested (Polkinghorne, 1989: 54-55). Polkinghorne believes that this lack of openness to truth is the antithesis of the scientific spirit. I don't have space here to go into greater depth over the question of miraculous healings, but I would argue that there is room for scientific investigations of miraculous healings as a result of prayer, and that this may be an appropriate area for Augustinian science. I accept that Hume was right to call for thorough investigations by a body of learned scholars in order to properly assess the evidence of such claims, but Hume seemed to reject the possibility of miracles whatever evidence might be presented. Even so, conclusions reached about the nature or means of healing may only be based on a balance of probability if examined scientifically, and spiritual healing is most meaningfully felt at the level of the individual and is often very personal. So miraculous healings as a response to prayer are not so easily testable across the scientific community because of problems associated with, for instance, designing properly controlled and ethical experiments. That is the nature of induction or abductive inferences, but responsible peers can conduct the process of investigation in a 'science-like' way through careful analysis. However, even though the evidence for miraculous healing may remain probabilistic the evidence may be held legitimately as part of a core Christian belief.

³² Polkinghorne references Hume's *An Essay Concerning Human Understanding*, Part X.

Similarly, I believe that Intelligent Design may also find acceptance within an Augustinian approach to science where prior theological beliefs are brought to bear from the start.

3.1.4. Weak Arguments Against Methodological Naturalism

Having established his argument for warranted Christian belief, Plantinga offers further, but really less convincing, arguments against methodological naturalism. He criticises Ruse's *definition* of science because it does not do justice to the historical work of philosophers of science.³³ From this he notes that philosophers working in this arena over several centuries have failed to identify clear demarcation criteria for science, partly because of problems of definition. Therefore the claims that science must be 'repeatable', 'merely natural' and 'governed by natural law' are weak. For example the idea of repeatability would mean that there are features of the natural order that science itself could not investigate, such as the big bang. The question of natural laws also appears problematic because he doesn't believe it is clearly established that such laws exist, or what their status is; he prefers to speak about *regularities* (Plantinga, 2001: 343-345).

In response Ruse offers a number of further reflections. Firstly, he comments that there are many events in history that are unrepeatable, such as the demise of the dinosaurs, and that the criterion of uniqueness cannot be used to dismiss something from science. Such events, even those that are unique, can still be explained by natural laws, and events that appear similar may have unique combinations of scientific characteristics (Ruse, 2001: 367). And it is true that the difficulties presented by unrepeatable events do not mean that it is impossible to construct plausible models of what may have happened historically, but this does lead us away from certainty in science to reliance instead upon abductive inferences, and therefore to more probabilistic reasoning.

Ruse also finds it hard to take Plantinga's doubts about the existence of laws of nature seriously (Ruse, 2001: 368-369). Plantinga doesn't seem to make his case with much conviction, but he further suggests that such scientific laws have been developed through the influence of Enlightenment deists and as such are not really compatible with theism. Ruse, rightly I think, points out that many Christian philosophers of science

³³ Plantinga also responds to some more theological claims that are not directly relevant to this chapter.

accept the existence of natural laws as given by God and that it is possible to understand laws of nature in an entirely theistic context. Furthermore, belief that such laws exist and are real has enabled science to advance in many ways. Ruse also claims that the justification for the existence of such laws need not be based upon the context of their discovery. For instance, much of Newton's work started out from a desire to understand and discern the mind of God, but today such metaphysical commitments are not directly relevant to secular science. So Ruse believes that science can move ahead in a secular way without taking the religious commitment with it (Ruse, 2001: 368-369). Although this may be possible, at the same time philosophers of science need to be careful that they don't undermine the foundations on which law-based science rests, and therefore undermine the scientific process and also remove a beneficial heuristic for future discovery.

Thirdly, Ruse responds to Plantinga's observation that the rules of science are not clearly defined and thus there are no clear lines of demarcation between science and other human activities. As such the boundaries are seen as 'loose' or 'fuzzy.' Ruse claims that the lack of clear demarcation criteria doesn't count as an argument against methodological naturalism, and offers as an example his work on the history of evolutionary theory, which started out as pseudo-science, progressed to a popular level science and became a professional science (Ruse, 2001: 369-370). Furthermore, Ruse rejects Plantinga's assertion that methodological naturalism is only a definition, and an attempt to merely categorise science for general consumption without any reference to a deity or God. He reasserts that his position does not necessarily question the existence of God, or what role God may or may not have played in the past in the world, but that the practice of science cannot work on the basis of such a possibility (Ruse, 2001: 371). However, the lack of clarity over the demarcation question does raise questions about the appropriateness of insisting that methodological naturalism must be followed as the only path for science, although it may provide a useful guide for science to begin if held in a spirit of openness as Fuller for instance has argued (Fuller, 2007: 108-109).

3.1.5. Responding to Two Stronger Reasons for Methodological Naturalism

Plantinga does though question two stronger arguments that he believes can be cited in support of methodological naturalism. The first stronger reason is taken from Pierre Duhem's idea that science should be entirely secular and free from metaphysical or

religious beliefs so that it becomes universally accessible irrespective of such worldviews (Duhem, 1954; Plantinga, 2001: 352-355). However, while Plantinga concedes that in many neutral areas (such as practically all of physics and chemistry and much of biology) the Duhemian approach is the appropriate way to do science, in those areas where science does impact upon Christian faith then there are no reasons why the Christian community cannot move beyond methodological naturalism and do science in its own way. And this religiously grounded *Augustinian science*, he believes is an approach that can be properly scientific (Plantinga, 2001: 355). Although those with different worldview beliefs and commitments will disagree in some areas, a consistently neutral approach to science is very difficult if not impossible. So, in areas where there is a clash of beliefs, theistic scientists may legitimately move to Augustinian science with their own additional faith commitments, and Plantinga asserts that there is nothing in the rules of science that should prevent this (Plantinga, 2001: 357-358).³⁴

Ruse recognises that Plantinga wants to speak about ‘theistic science’ or ‘Augustinian science’ instead of just ‘science’ on those occasions when moving beyond methodological naturalism, but he asks what right his position has to even claim use of the word ‘science’? (Ruse, 2001: 371-373). Ruse quotes from Ernan McMullin, a Roman Catholic priest, who makes a similar point that theistic science should not even be called science because it does not follow the normal rules of science which involves ‘systematic observation, generalization and the testing of explanatory hypotheses.’ Neither does theistic science allow a Hindu or agnostic who would hold to different presuppositions to engage in the scientific enterprise (McMullin, 2001: 165-196; Ruse 2001: 371-373). However, to be fair to Plantinga he doesn’t seek to prohibit those of other religious persuasions from conducting science in their own way. But in response to the central claim here it may be noted that not all philosophers of science accept such

³⁴ Gavin D’Costa expresses sympathy with Plantinga’s position and argues that the Christian academic community should have the freedom to pursue science in its own way because all of creation is the handiwork of God (D’Costa, 2005: 184-203). The study of creation should be pursued in the context of Christian love for the world as an exercise of worship towards God, with instrumental or functional needs considered secondary (D’Costa, 2005: 188). Theology then has an important and central place within a Christian university as a ‘servant “queen of the sciences”’, and the most fruitful way of studying science and theology is to recognise that there is an inter-relation that will shape both the methodology and conclusions that are reached. For the Christian, all areas of study are focused upon God’s creation, and these studies should be illuminated by an understanding of God’s purposes in creation, and through the Christian community (D’Costa, 2005: 191, 214).

limiting criteria. Feyerabend for instance argued against the idea of there being one valid scientific method that all should follow and believed that categorical statements that affirm criteria for such methodology are really fictitious and misguided (Feyerabend, 1970; 2011). However, Feyerabend was for a time accused of engaging in relativism, which would undermine the very practice of science, although his argument may be interpreted as implying that scientific progress requires openness and novelty in order to pursue investigations.³⁵ But in response to fears of relativism, the Calvinist Lakatos believed that it was acceptable to hold to a core of beliefs dogmatically. I will return to discuss this aspect more fully later, but it may be noted that theistic commitments and doctrines have historically been influential to the development of science. Peter Harrison for instance suggests that such doctrines included recognition of a noetic effect of sin, a belief that encouraged the development of the experimental process by Bacon and the early Royal Society. Also the Reformers' commitment to a literal reading of the Bible encouraged a more literal reading of nature against the pre-modern more allegorical reading (Harrison, 1998; 2007). In this light one may ask why Ruse should seek to claim copyright over the word 'science', especially when theistic commitments have historically been very beneficial to the development of science.

The second stronger reason for considering methodological naturalism to be the proper way to do science is the claim that appeals to supernatural causation in effect stop science (Plantinga, 2001: 355-357). Plantinga agrees that as a general rule methodological naturalism is a very useful approach to science, but he also notes that scientists cannot know that God has not done some things directly as well. Furthermore, there is no reason why the claim that God does some things in nature directly cannot be part of a 'proper scientific theory.' Plantinga goes further and asserts that if God acts indirectly in creation, then it follows that he must also have at some point acted directly, and asks what 'warrant' we have to presuppose that God is no longer able to act directly today (Plantinga, 2001: 346). While recognising that methodological naturalism provides a good 'general counsel' for how science should be conducted, he believes that it cannot insist upon a 'principled proscription' of direct divine intervention, and wonders why the possibility of direct divine action in science is ruled out so arbitrarily (Plantinga, 2001: 345-352, 355-357). Why, he asks, cannot scientific accounts go beyond relationships within nature to consider relationships between God and creation,

³⁵ Comments by Eric Oberheim in the Introduction to, *The Tyranny of Science* (Feyerabend, 2011: ix), also (Feyerabend, 1987).

especially when Scripture (as he reads it) does not prohibit such divine activity in creation? (Plantinga, 2001: 349). Plantinga's position is that miracles, whether through indirect or direct action in creation, are as likely as natural laws because they are both seen as part of a seamless holistic view of God's activity in both creating and sustaining creation. Ruse does though criticise Plantinga for engaging in a 'sleight-of-hand' in this on the basis that many of the commonly believed miracles, such as the Roman Catholic belief in transubstantiation,³⁶ are not miracles that are observed to negate natural laws; the same applies for the creation of the individual soul upon conception (Ruse, 2001:375-376). But even though some miracles work with the grain of natural laws there remains the possibility that some miracles work counter to such laws. Ruse, following McMullin, is for instance willing to concede the possibility that there may be a place for miracles in the death and resurrection of Christ, even though they are not considered necessary for creation. However, by allowing a small opening for miracles in the redemptive work of Christ it is less clear why such miracles must be excluded from creation in other contexts.

Ruse recognises that Plantinga seeks to avoid the 'God-of-the-gaps' problem through serious engagement with Christian theism, although he is critical of this and argues along the lines of McMullin's theology that there is an unnecessary complication involved here. Instead, Ruse suggests it would be preferable to believe that God in fact prefers to act through law rather than intervention in bringing creation into its fullness. Ruse therefore believes that Plantinga's position follows from an over-literalistic and erroneous reading of the Bible and that this forms the basis for his Augustinian science (Ruse, 2001: 375). He rejects Plantinga's assertion that there are times when it is appropriate to stop science, and comments that science has been enormously successful in ploughing on in the belief that science is unstoppable. As an example he uses the fact that female worker bees offer their services to the hive even though they have no chance of reproducing. He points out that following many years of difficulty in explaining this in naturalistic terms William Hamilton eventually suggested that 'kin selection' was the key because in hymenoptera (bees, ants and wasps) worker females are more closely related to sisters than to daughters (Ruse, 2001: 377-378). Ruse believes that Plantinga ignores such success as this because he is already committed to his own brand of theism and that he doesn't therefore engage with the evidence and take science seriously, and

³⁶ Plantinga, as a Reformed neo-Calvinist, most probably doesn't accept the doctrine of Transubstantiation.

this failure covers a wide area of scientific research (Ruse, 2001: 377-382). I think though that Ruse really misses the point here. Presumably, Plantinga would not deny that his philosophy and theistic belief are faith-based, but believes that naturalistic science is equally weighted and grounded by prior commitment and ponders why the scientific community does not acknowledge it more openly.

3.1.6. Lack of Understanding

What I think becomes evident from this discussion is that neither Plantinga nor Ruse really respond to the crucial elements of the other. In other words, they appear to be talking past each other.³⁷ Plantinga's metaphor of a struggle between two cities seems very apt as often political or national struggles involve a lack of understanding and this is reflected in the metaphysical question under consideration here as well. Ruse expresses frustration because Plantinga does not seem to engage in detailed arguments about the science, while Plantinga's approach is to question the philosophical foundations of naturalistic science. Therefore his position is that naturalism, even in methodology, is bound to shape the scientific conclusions that are reached, and if working within naturalistic methodology then a scientist can only arrive at naturalistic conclusions. Ruse on the other hand is happy to accept naturalistic methodology for science, believing it to be the only acceptable approach. Plantinga considers the classical foundationalism that he thinks Ruse is working under to be inadequate and favours what he calls Reidian foundationalism; this places belief in God, and the need to believe in other minds, on an equal foundational footing to rational arguments and immediate experience. Plantinga's approach is clearly a development that Ruse cannot accept, although Ruse doesn't here offer strong philosophical reasons why it must be excluded as a basis for science, he just doesn't believe it meets the requirements of methodological naturalism. So, while Plantinga offers philosophical arguments in the foundations of science, Ruse largely responds with arguments about scientific data on the assumption that classical foundationalism is unquestioned.

Plantinga is perhaps not qualified to engage in detailed scientific debates and he is seemingly aware of this; he does not seem to fully understand the Cambrian Explosion and perhaps misses the point about Big Bang cosmology in that natural laws must break

³⁷ Thomas Kuhn called this lack of understanding between different paradigms 'incommensurability' (Kuhn, 1970: 148).

down at some point in *time*.³⁸ It is indeed possible to study unique events scientifically as Ruse claims, but not when laws of nature have broken down. However, the problem with arguments over the content of scientific papers is that they are potentially endless. When one paper is read and scrutinised and critiqued then there are thousands of others that Ruse could raise in evidential support of his position. Ruse would of course see this as strongly supporting methodological naturalism, but clearly it is not feasible for anyone to scrutinise all scientific papers, many of which must therefore be accepted on the basis of trust. Plantinga prefers to question foundational beliefs that underpin and inform science and I think Ruse's criticism against Plantinga for not engaging with particular papers is not entirely realistic.

3.1.7. Common Ground

There is however at least some common ground between Plantinga's position and Ruse's naturalistic methodology that needs to be recognised. Plantinga acknowledges that in many areas of science, perhaps all of physics and chemistry and much of biology, there may well be agreement for Duhemian or worldview neutral science to be undertaken as a general counsel, even though in areas that are close to what it is that makes us human there is an inevitable clash due to prior worldview commitments (Plantinga, 2001: 357). Plantinga also accepts that there are regularities that make science possible, and there is no reason for Christians to deny the existence of such laws or regularities in nature, whether or not they are seen as hard and fast laws or as regularities they can I believe be properly understood in a theistic context. Alexander follows Plantinga in rejecting the Enlightenment idea of nature as a semi-independent entity driven remotely by preset natural laws and sees God as immanently involved in upholding the order of creation; thus preferring to speak in terms of the orderliness of creation as opposed to laws of nature, and also preferring to speak about scientific explanations as opposed to methodological naturalism or naturalistic explanations, although the basic idea he believes remains the same (Alexander, 2008: 31-33; 183-186). Christians may therefore approach science on the basis that there is a God-given order which then makes science possible, and from such a belief in order there is no

³⁸ That is whether the laws of physics break down at a time shorter than the Planck Time and whether the universe can really be explained by 'unbroken' natural laws. Perhaps science may make a breakthrough in this area, but it is not certain. Stephen Hawking has offered some thoughts in this direction, but his approach is not universally accepted (Hawking, 1988; 1993).

reason to give up on methodology in science. There is also common ground in acceptance of the existence of objective truth between Ruse and Plantinga, and the theist has arguably stronger reasons for believing in such truth than the metaphysical naturalist. For atheists both truth and laws of nature must be accepted as foundational positions requiring no further explanation, while for theists the orderliness of creation and objective truth are explained in terms of the divine mind and will, thus offering a degree of personal level of explanation which offers some coherence with Intelligent Design.

3.1.8. Methodological Naturalism Has Some Success

Ruse makes the claim that his approach, which does not appeal to direct divine agency, has been remarkably successful in advancing science, and I think there is some merit in this claim. But the question that may be asked is whether historical and present success must equate to universal success, and whether such success is due to the general use of good methodology or to a belief that nature must possess functional integrity. Both Ruse and Plantinga are agreed that science is limited in scope to examining the material world, but that there are relationships that go beyond science; in philosophy for Ruse; in philosophy and theology for Plantinga. If science is limited then there are bound to be places where science must stop, but Ruse considers that invoking supernatural causation unnecessarily is in fact a science stopper. Care does need to be taken to try and get explanations right for the sake of good science and good theology, but that may not always to be easy in practice.

Both Ruse and Plantinga accept that there are no clear demarcation criteria between science and non-science. Plantinga thinks the attempt to find such criteria has failed, although he does not believe there are no differences between science and faith just that the boundary is not firmly established (Plantinga, 2001: 344). Ruse recognises that there are grey areas between science and non-science and responds that even though there are no agreed clear demarcation criteria, that is no reason to give up on methodological naturalism. Lack of clear criteria that differentiate between science and non-science is indeed not a reason to give up on methodological naturalism, and it may be acknowledged that it has been very successful, but I would suggest that it can then only be accepted as a general framework for science as Plantinga notes, as it is harder to justify it as an absolute principle for science beyond mere assertion. Ruse further

recognises that even evolutionary theory has progressed from pseudo-science to popular science to become a professional science, although he doesn't offer a reason why some metaphysical ideas, such as pre-scientific evolution, are allowed to progress from non-science to science, while others, such as Intelligent Design, are not (Ruse, 2001: 369-370). Some work to develop a consistent framework is necessary here to justify why there is possible progression from non-science to science in some areas, but not others, but Ruse doesn't seem to offer a reason. I will return to the question of what might constitute such a framework in the next chapter section. So although it should be acknowledged that methodological naturalism has been successful historically, there are limitations to that success because of what we discern from the philosophy of science.

3.1.9. A Problem in Dialectics – Dogmatism versus Relativism

There is further a problem of dialectics in scientific methodology that shows itself as a need to avoid both the pitfalls of relativism and excessive dogmatism. As well as being critical of inductive reasoning Popper was also critical of dialectical approaches to logic because he believed that it leads to logical contradictions. This is because the meaning of concepts through a dialogue change as the argument develops in sophistication. Popper was further fearful that dialectical reasoning, especially that of Hegel, would lead to a rejection of objective truth, as well as value, and that tyranny and brutality may then be justified politically, as exemplified he believed in Europe in the early twentieth century (Popper, 1966: Ch.12, 395). Popper also thought that freedom must allow intellectual criticism, which can help protect society from such tyranny (Larvor, 1998: 45). But tyranny and the abuse of political power can come through both excessive dogmatism where 'truth' must be upheld brutally, or through excessive freedom and subsequent relativism where loss of objective truth leads to a loss of objective values.

Lakatos' approach was initially strongly dialectical, but later modified in light of Popper's criticism. Lakatos recognised, from a reading of the works of Plato (especially from the *Republic's* concept of justice) that there were two ways that logical arguments could be developed. One was through non-dialectical reasoning that was concerned with the logic of *propositions*;³⁹ the other way involved a dialectical approach where there was dialogue over *concepts* (Larvor, 1998: 9-11). In reality though, especially in mathematics, dialectical dialogue is undertaken through discussions about the logic of

³⁹ For instance Euler's formula for polyhedra (Vertices-Edges+Faces=2)

propositions. In other words different people or groups raise propositions that are then discussed through dialectical discussions. Lakatos recognised that it is often hard to separate the logical structure of such arguments. With dialectical logic the relevant question is whether there is a progressive development in the sophistication of arguments through the dialogue (Larvor, 1998: 9-11; Lakatos, 1976). The problem though with dialectical reasoning is that concepts are not clearly defined, but change as they develop in sophistication. As noted, this can lead to relativism, a situation that neither atheists nor theists find satisfactory because of a commitment to objective truth, although it is not such a problem within postmodernist thinking where truth becomes relative. In *Against Method*, Feyerabend was opposed to *methodological monism*, the idea that there can only be one proper methodology for science, and instead argued for an anarchic approach to scientific methodology where anything goes, even for a time embracing relativism (Feyerabend, 1970; 2011: ix). His criticism was that it would inevitably restrict progress in science, and thus undermine the very practice it seeks to uphold; a *reductio ad absurdum*. In this light, the claim of Ruse that methodological naturalism is the only way to do science may be seen as an excessively dogmatic position that will hinder scientific progress. Feyerabend also, in *The Tyranny of Science*, rejected the belief of Monod that all of reality could be explained through chance and necessity because it takes away from various subjective criteria that for many people makes life meaningful (Feyerabend, 2011). He considered that religious belief might therefore have a place within an approach to epistemology, but also allowed other metaphysical systems a place as well. So, in balance, the total rejection of dogmatism in science may mean that problems arise in association with relativism and pluralism because it potentially undermines the practice of science if we lose sight of objective truth.

Lakatos followed Kuhn in understanding scientific progress in terms of it working out through often-competing research programmes. He therefore came to believe, partly through his own historical research, that it is necessary to hold the core of research programmes in a dogmatic manner to avoid progressing towards relativism (Larvor, 1998: 52; Lakatos, 1978: 148). Additionally for Lakatos, auxiliary hypotheses may be added to the core of a research programme and these may prove progressive, degenerative, or simply ad hoc. The process of testing and selecting progressive auxiliary hypotheses over degenerative ones provides the heuristic for the research programme. The side hypotheses then protect the core because criticism can be

deflected to the protective belt (Larvor, 1998: 52-55; Lakatos, 1978: 179). For Lakatos, it was this methodology that provided the demarcation between science and non-science, although he did not believe that failing research programmes should be abandoned altogether because new evidence may arise in the future that gives fresh impetus to a failing programme (Larvor, 1998: 55-56). Ultimately, for Lakatos, science was an exercise in truth seeking, not merely about the advance of technology or a rule-based game for solving problems (Larvor, 1998: 73).

That is just a brief account of the ideas of Lakatos, and I will return to them in the next section of this chapter. I will look at the development of scientific research programmes in order to consider whether there is some correlation between Plantinga's proposals, where Augustinian science may be carried out from theistic beliefs, and the proposals of Lakatos where the central cores of competing research programmes may be held dogmatically. In other words, Plantinga's belief that Christian groups should be allowed to do science from theistic beliefs may gain some support from the proposals of Lakatos. Augustinian science, as well as methodological naturalism, may then be seen in some sense as Lakatosian research programmes, although perhaps more appropriately as *meta-research programmes* that offer foundational bases on which different scientific research programmes may be developed. Plantinga's approach then, I would argue, is in line with the type of approach to science that Lakatos outlined. By holding dogmatically to a central core of beliefs an Augustinian approach to science may maintain a commitment to objective truth, but at the same time allow freedom for others to pursue science in their own way.

There is though a general reluctance amongst Intelligent Design proponents to allow dogmatic religious commitments into their work, and as such they wish to distance themselves from the appearance of using religious doctrines. Dembski writes that although Christian theists may 'co-opt' the Intelligent Design proposals, it is entirely 'optional' (Dembski, 2007: xvi), and Intelligent Design may be useful to non-Abrahamic religious positions such as Stoicism and Platonism as well as Judaism, Christianity and Islam (Dembski, 1999: 252, 273-276). Behe believes it possible to use inferences to design without identifying a candidate for the designer (Behe, 1996: 196). In other words, proponents seek to maintain that Intelligent Design offers a perfectly valid explanation for the natural order that can be discerned through the scientific senses alone without recourse to theological beliefs and presuppositions. This is justified for

instance through an appeal to Reid's belief that people are forced to believe in the existence of other minds from the effects and marks produced (Dembski, 1999: 211-236; Reid, 1780; 1872; 1983). However, belief in the existence of 'marks' is in effect a religious doctrine; as Dembski points out with reference to Bonaventure, and McGrath in relation to Augustine as the *vestigia Trinitatis* (Dembski, 1999: 127; McGrath, 2009: 76). So, there are times when Dembski seems more equivocal on this point arguing that Intelligent Design may form a 'bridge' between science and religion, and offering insights in Christian theodicy (Dembski, 1999; 2009).

But as discussed already excessive freedom and the lack of a firm foundation makes the testing of hypotheses very difficult and risks relativism in science, and the approach set out for Intelligent Design potentially undermines its acceptance as science. Antony Flew has also recently made the case for freedom in science where scientists and philosophers should be prepared to 'follow the argument wherever it leads.' This he calls the 'Socratic principle' and he takes it partly from the dialogue in Plato's *Republic* (Flew and Varghese, 2007: 22-23). This principle, Flew pointed out, formed the basis for the Oxford based Socrates Club, a forum for debate between atheists and Christians around the time of the Second World War overseen for many years by C.S.Lewis.^{40 41} However, I think it is misguided to think that we can follow an argument without consideration of foundational commitments. Where an argument goes will be determined in part by its starting position, and without core commitments the meaning of a concept, such as Intelligent Design, may change. I would suggest that excessive freedom, and minimalist approaches to science, risk relativism because of a lack of clear definitions, and this weakens the claim that Intelligent Design should be considered good science. I believe instead that proponents should seek to ground their work in some theistic doctrines in order to overcome this weakness.

Furthermore, Plantinga sees the type of Reidian position, where we may believe in other minds from the marks produced, to be a prior commitment, identifying it as Reidian

⁴⁰ C.S.Lewis was President of the Socratic Club from 1942-1954, and Lewis quoted the phrase in the first issue of the *Socratic Digest* (Flew and Varghese, 2007: 22-23).

⁴¹ Polkinghorne has also suggested that God's sovereign action in nature may sometimes be unexpected even though God's activity must always be consistent, and that questions therefore remain about how God might act in creation. So for a theist he comments that the boundaries of science should not be bound 'so tightly that there is no scope for the particular action of a personal God' (Polkinghorne 1989: 58).

Foundationalism (Plantinga, 1993: 183-185). In fact we may go further and note that Intelligent Design proponents begin their work from a belief that design is real and not merely imaginary and this logically entails a designer. So, although proponents seek to make minimal prior commitments they do make some that arguably have a degree of theological content, and Intelligent Design theory really needs to go further with the inclusion of stronger prior commitments so that it may be developed into a proper research programme. But if Intelligent Design theory as currently presented risks relativism, the type of argument that insists that methodological naturalism is the only way to do science is excessively dogmatic and risks hindering scientific progress.

However, in seeking to overcome the problem of relativism that may arise with the dialectical approach, Plantinga's approach potentially restricts what can be found scientifically because it holds a core of beliefs dogmatically. Although different meta-research programmes may begin science from different starting positions and may reach different conclusions, all begin from foundational positions that potentially restrict what may be discovered. Dogmatic methodological naturalism cannot uncover direct divine agency because it is ruled out from the start. Augustinian science may also fail to make a natural, law-based discovery because of a prior belief that something was done through direct supernatural causation, and not according to an indirect physical process. So, for both naturalistic and Augustinian methodological approaches to science the commitment to maintain objective truth restricts what may be discovered. However, by engaging in dialogue across the divide, while maintaining a commitment to the core, it may be possible for each side to learn from the other and potentially allow knowledge in science to progress, whereas an isolationist position for both sides may prevent potential discoveries and non-dogmatic approaches risk leading to a loss of the concept of objective truth which would undermine science.

Mikael Stenmark has offered some qualified sympathy for Plantinga's Augustinian science, but also raises the question of pluralism. He asks why proponents of other metaphysical worldviews may not also begin science from their beliefs as well (Stenmark, 2004: 189-207).⁴² The problem is that if different groups with varying

⁴² There is also some correlation between Plantinga's proposal for a separate Augustinian Science and the work of Michael Polanyi in *Science, Faith and Society* (Polanyi, 1946). Polanyi saw science as a balance between intuition and criticism overseen by the human conscience that should seek after truth. However,

worldviews wish to begin science from their own starting beliefs then it will inevitably lead to the development of a multiple ensemble of different outcomes. The interesting question from this then is whether such multiple outcomes are desirable, acceptable or perhaps unavoidable? I would suggest that if science is to be an open enterprise in a free society, then there is no reason to exclude people with different worldviews from doing science in their own way, although ideally it would be done according to good ethical standards and there would be a need for all to remain committed to a core belief in order and in objective truth. But it seems to me that if Plantinga's proposals are accepted, then science is going to have to come to terms with some plurality.⁴³ Science must allow some freedom in order to allow progress and avoid excessive dogmatism, but too much freedom will lead to relativism.

3.1.10. Summary

So, in this section I have argued that Intelligent Design can be rescued from relativism if held within Augustinian science, and that this may allow it to be developed to the point where it begins to make predictions. This may well entail making foundational commitments that are theological in nature, but it needs to be acknowledged that all scientific positions begin with some prior metaphysical commitment of some form or another. A purely neutral position is very difficult to maintain consistently. In the next section I will examine in greater depth the question of whether Intelligent Design can be developed into a research programme, even if it is as a theologically grounded meta-research programme.

Polanyi also saw that different groups would unavoidably reach different conclusions about what is true in science. I will consider Polanyi's work in the next chapter section.

⁴³ Fuller though points that for William Whewell there should be only one paradigm within science, and that was the Newtonian approach where the purpose of science was to uncover the divine plan and intelligent design as observed in nature (Fuller, 2010: 55-57).

3.2. Intelligent Design and Scientific Research Programmes

3.2.1. Introduction

In the previous section I looked at Michael Ruse's criteria for methodological naturalism in dialogue with Plantinga's argument for Augustinian science (Ruse, 2001: 364-385; Plantinga, 2001: 339-361). From this, I have accepted that Intelligent Design cannot be part of science if science must follow the rules of methodological naturalism, but it may have a place as Augustinian science where core commitments are held foundationally. So, having considered the possibility that an Augustinian approach may provide support to Intelligent Design as one that runs alongside methodological naturalism, it is now appropriate to return to consider in more depth the question of explanatory power if Intelligent Design is to be considered good science. Mackie and Sober have argued that the design argument must make testable predictions for it to have validity as a scientific theory (Sober, 2007; Mackie, 1982: 136-137). But the question of verification or falsification is generally conducted within the framework of scientific research programmes. So, in this second section I intend to consider how Intelligent Design as part of an Augustinian science might be developed into a scientific research programme and thus be explanatory.

3.2.2. Intelligent Design and Explanatory Power

I have already discussed some of the background to questions relating to inferences to the best explanation, and I will summarise this here. Elliott Sober argued that for Intelligent Design to be properly considered as good science it must take seriously the need for falsification, although he has also recognised that there is the possibility for accommodating the data into a coherent framework when working with inferences to the best explanation (Hitchcock and Sober, 2004; Sober, 2007: 3-8). It has been noted also that both Intelligent Design and Darwinian explanations involve such inferential reasoning because they are dealing with historical questions that are difficult to submit to laboratory experiments.

Proponents of Intelligent Design theory have seemingly struggled so far to develop their ideas into a coherent research programme and thus make testable predictions, and perhaps this is because of its youthfulness. There are though signs that the question is being considered. Although Johnson referred to the positions of Popper and Kuhn in his

book *Darwin on Trial*, mainly in an attempt to undermine evolutionary arguments, he had little to say about Intelligent Design, and how it might be tested and formulated into a proper scientific theory (Johnson, 1994). More recently though, Meyer has presented some ideas concerning this question (Meyer, 2009: 396-415), and Dembski too has offered some initial considerations towards a ‘design-theoretic research program’, but not in detail with reference to the work of philosophers of science (Dembski, 2007: 311-371). The nature of abductive reasoning though makes predictions difficult when addressing non-repeatable historical questions, but I believe that the question of accommodating the work into a research programme may provide a more fruitful way forward. As discussed already in response to Mackie’s first objection to the design argument Meyer has shown that those sciences involved in historical questions may seek to reconstruct the past through abductive reasoning as opposed to an approach that looks forward; in other words it seeks to accommodate the data into an historically focussed research programme (Whewell, 1847; Lipton, 1991; Meyer, 2009: 152-153, 156). McGrath shares the belief that a natural theology can be justified in terms of accommodation and notes that in this regard it at least has some common ground with other areas of science (McGrath, 2009: 59-60).

McGrath writes further that Darwinian ideas also experience problems when facing the need to demonstrate predictive power and notes that Ernst Mayr recognised these difficulties. The difficulties arise because evolutionary explanations involve the description of random, contingent events in history that resist predictability, and although it is possible to posit possible causal pathways it is difficult to demonstrate through repeatable experiment exactly what has happened (McGrath, 2009: 89; Mayr, 1997: 64-78). So, it would seem that both Intelligent Design theory and neo-Darwinian evolution face common difficulties in terms of explanatory power, but both research programmes may potentially be developed through accommodation instead of prediction. Ard Louis has described the process of accommodating data into a coherent evolutionary research programme in terms of fitting data into the pattern of a *tapestry*, and believes that because there is so much evidence that fits the tapestry it forces us to accept that the evolutionary tapestry is true (Louis, 2007; Mermin, 1996: 11-13).⁴⁴ However, we may note a circularity here that McGrath has described as ‘self-evidencing explanations’ where ‘A explains B, but B justifies A,’ although McGrath accepts that

⁴⁴ Louis comments that this idea comes from David Mermin. Louis’s paper has been translated into English as ‘Miracles and Science: The Long Shadow of David Hume,’ (nd) by The BioLogos Foundation.

such reasoning is often necessary and unavoidable in science (McGrath, 2009: 52-53). Evidence is thus selected as true because it fits the tapestry, and then is used to justify the truthfulness of the tapestry. Of course such reasoning does not necessarily lead to false beliefs, but there is a limiting factor here in terms of absolute explanatory power, and this weakness may also apply to Intelligent Design theory. Instead we can only speak of coherence to a pattern.

The question arises then whether Intelligent Design is also forced to rely upon self-evidencing explanations. The evidence for Intelligent Design could also presumably be fitted into the pattern of a tapestry and then turned around to justify the truthfulness of Intelligent Design, but many would find such reasoning inadequate. The problem for Intelligent Design arises because of the nature of abductive reasoning. A further difficulty is though that it is very hard or impossible for human beings to conceive of design as anything other than the product of a human mind; so we tend to anthropomorphise and see, for instance, the spider's web or bird's nest in terms of humanly engineered structures, or we reduce God to the level of a human engineer.

The process of pattern recognition in science has been identified by Polanyi as *Gestalt Psychology* where identifying order or patterns forms a part of human reality as intuition, perhaps even at a sub-conscious level. This he describes as the 'tacit coefficient of scientific theory.' For instance the human mind is able to identify quickly the shape of an egg without having to work through the mathematical calculations that determine its complex shape (Polanyi, 1964: 10-13). Polanyi believed that scientific discoveries often follow a similar path that necessarily involves the scientist's intuition that is tuned by experience to identify patterns. Justin Barrett has also recently claimed that there is a natural tendency involved in the way people, from the age of childhood and from both religious and non-religious backgrounds, favour personalised design explanations over non-design explanations. In other words, it would seem that design recognition or the need to appeal to agency in forming explanations is hard-wired into people from a very young age. However, Barrett believes there is a difficulty here in that it is the same area of the brain that forms beliefs in goblins, ghosts and space aliens as well as belief in God (Barrett, 2004: 31-33; McGrath, 2009: 67). So it is not so easy to determine the nature or character of the agency from pattern recognition alone, although once again I would suggest that the tendency to anthropomorphise does play a part in the way human beings form a mental map of such agency. Ghosts for instance

are popularly considered to be the spirits of the dead, and indigenous people not exposed to monotheistic religious beliefs tend to worship their ancestors. Although it is possible with some imagination to view god-like beings in the form of mythical animals, they are often ascribed some human-like quality, or spiritual entities may be seen to possess super human abilities. But although I believe there is a trend to conceptualise the deity in human terms, the model of God often associated with classical eighteenth natural theology is that of a disinterested, remote and distant clockmaker who set the system going and then left it to run according to its own devices, and thus not the loving relational God of Christian faith.

From this then I would suggest there is a difficulty in being really objective in the way Intelligent Design questions are verified because design explanations seem to harmonise so well with the way the mind works and pattern recognition in science in general, but then acceptance of design is not independent of the mind. This is where critical human judgements are necessary as Polanyi recognised. Atheists such as Francis Crick have commented that it takes conscious effort for biologists to remind themselves that the evidence for design in nature is not real (Crick, 1990: 138), and Richard Dawkins also commented that 'Biology is the study of complicated things that give the appearance of having been designed for a purpose' (Dawkins, 1987: 1). In other words, even for the atheist there is an *appearance* of design, even though not accepted as real design. So although an Intelligent Design research programme may justifiably utilise an accommodationist approach the difficulty comes in being truly objective in assessing the truthfulness of the design claims because of the way the human mind tends to automatically see design. The mind seems to naturally want to begin science from a belief in design or order, but this makes the process of objective verification problematic due to lack of distance between subject and object. The argument for Intelligent Design is then faced with a similar problem of self-evidencing explanations. That is, seeking to justify the design explanation that is already believed to be true, where it may be claimed that a designer explains the appearance of design, and the appearance of design justifies the designer. The best way around this I would argue is to simply acknowledge that Intelligent Design begins with a belief that design is real as a theological presupposition. In this light, it may be held that mankind is created in the image or likeness of a creative God, and for the Christian the designer can be further seen revealed in the person of Jesus Christ. This does though require a strong overlap between science and revealed Christian doctrines. But in terms of explanatory power, it

is clear that the outcome of an Intelligent Design research programme if held within Augustinian science will be dependent upon foundational commitments.

In light of the Augustinian framework that I believe Intelligent Design best fits within I now want to consider how the problem of verification might be approached for such a research programme. Interestingly though, it may be seen from the following discussion that Augustinian presuppositions are already present in the thinking of some philosophers of science that have a bearing upon this question. But it is also necessary to recognise that Augustinian science and methodological naturalism are really examples of *meta*-research programmes because of the differences in foundational commitments. So arguments between proponents of naturalistic evolution and Intelligent Design are not just about evidence in science, but about what is already believed before science begins. These are I believe foundational differences that will shape the way science is conducted and verified. So I now want to look at the work of a number of philosophers of science, particularly Polanyi, Kuhn, Lakatos and Feyerabend, to see what possible support there is for Augustinian science as a framework for holding Intelligent Design.

3.2.3. Developing Research Programmes

3.2.4. Michael Polanyi

Michael Polanyi's approach to the philosophy of science was an endeavour to come to terms with the social and personal factors that he believed unavoidably shape the way science is conducted and judged, and his work has had some influence on a number of more recent approaches to the methodology of science, particularly those developed by Kuhn and Lakatos. Sharing a distrust of both fascist and Communist regimes Polanyi wanted to bring transcendent ideals of truth, justice and charity into the scientific community (Polanyi, 1946: 69). It is also evident that a degree of influence came from a number of the Church Fathers, especially Augustine.

Polanyi saw the necessity for prior faith commitments in scientific research as an enterprise of 'faith seeking understanding' (or *fides quaerens intellectum* quoting Augustine) (Polanyi 1964: 15, 45). Augustine's inspiration was a reading from Isaiah

7:9 (LXX), which reads that ‘If you do not believe, neither will you understand.’⁴⁵ Polanyi believed further that the way in which discoveries have been made in mathematics, involving ‘Preparation, Incubation, Illumination, and Verification’, closely resembles the life of the saints, where the human search for God, as exemplified by Augustine’s prayerful search, follows a similar path as the methodology of science (Polanyi, 1946: 19-20). He argued as well that the methodology of science was really in the form of an art or craft because there could be no codified or legal manuals for describing how scientific research should be conducted.⁴⁶ Science then requires prior faith commitments and practice if it is to do be done properly; and the strict methodology proposed by Francis Bacon doesn’t really capture the true character of scientific research (Polanyi, 1946: 19).

Furthermore, the mind of the scientist is faced with conflicting claims from both intuition and criticism, and therefore some way of adjudicating between the two is necessary. Too much intuition will lead to wishful thinking and erroneous discoveries, while too much criticism, with a strict set of rules, would completely restrict discovery.⁴⁷ Polanyi argued that there is in fact a third element that decides between intuition and criticism, and that is the moral conscience. Therefore, science is dependent upon the existence of a moral dimension as a foundational requirement (Polanyi, 1946: 26-27). As noted, Polanyi developed the idea of tacit knowledge, asserting that people know more than they are able to articulate due to the necessary skill or art of the scientist. How a person recognises familiar faces, or the shape of an egg for instance is not something we can describe perfectly in a scientific manner, but as discussed already is a form of Gestalt psychology, which suggests that such knowledge arises apart from

⁴⁵ Augustine, for instance in *De libero arbitrio* 1-4; 11.2, *Sermones* XVIII.3; XLIII.3 etc. Torrance further observed from Clement that the literal meaning of the Greek word *episteme* implied the ‘standing of our mind on objective realities’ and commented that ‘faith describes the connection between human thought and reality’ (Clement, *Stromateis* IV xxii). A short passage in Hebrews (11:1-3) was also an influence on Clement’s belief; ‘Faith is the substance (*hypostasis*) of things hoped for, the evidence (*elegchos*) of things not seen...By faith we understand that the worlds have been framed by the word of God, so that what is seen has not been made out of things that do appear’ (Heb. 11:1-3) from (Torrance, 1980a : 3, 4).

⁴⁶ Popper shared Hume’s scepticism of inductive reasoning, and, referencing comments by Max Born, also considered science to be as much a craft in its application and a matter of belief that involves a ‘metaphysical principle’ (Popper, 2002:44-56, 66-72; Born, 1949: 7).

⁴⁷ Intuition being an untested, but believed perception. Priyan Dias points out that Polanyi thought that excessive doubt and criticism, with influence from Descartes, undermined science, and that instead science needs to be pursued within a ‘fiduciary framework’ (Dias, 2010: 43-55).

normal scientific inferences. Therefore, establishing knowledge claims is dependent upon a set of skills where the personal aspects necessarily affect the way scientific conclusions are established (Polanyi, 1958: 49-65).

Polanyi also believed that the special authority of a particular scientist or institution should not be allowed to restrict science, because that would destroy the process of science itself; instead science can only have what he termed general authority (Polanyi 1946: 42-48). General authority is based on a consensual community spirit where science is pursued within a framework of freedom, but also with a commitment to fairness and tolerance where ideas are discussed democratically and with openness in the scientific society (Polanyi, 1946: 50-56). There is also a requirement for scientists to love truth and trust that others within the community love that truth also (Polanyi, 1946: 58). As well as truth, establishing reality also requires obligations to love and justice, which are necessary to guide the human conscience (Polanyi, 1946: 69-70). However, Polanyi recognised that different societies, whether for instance fascist, Marxist, pagan, atheist or fundamentalist Christian, have different metaphysical worldviews, and that this will inevitably shape the way in which a particular society reaches judgements about scientific discoveries (Polanyi, 1946: 68). From all of this he makes three further statements about science. Firstly, he rejects the possibility of verifying perfectly any universal position that is commonly held by scientists or people in general. Secondly, he asserts that people do not always uphold eternal truths, and thirdly, everyone is already committed from the start because of their own metaphysical or religious background and this moulds the way in which they approach and conduct science (Polanyi, 1946: 68-69). From this it follows that different societies will reach different conclusions about what is true.

One of the problems for Polanyi's approach is that it has been seen as subjective and too heavily reliant upon the creative imagination and intuition. Furthermore, Polanyi made an analogy between scientific discovery and extra sensory perception in his earlier work (Polanyi, 1946: 21), although he comments that he wrote his later work *Personal Knowledge* as a way of defending his ideas against the claim of subjectivity (Polanyi, 1958, 1964: 15). But such perceptions that appeal to extra sensory ability are not something that a purely naturalistic approach to science can easily accept, and from a truth seeking perspective appear very whimsical. But from a Christian perspective there is I believe the possibility of recovering a belief that our understanding of the world is

illuminated by a sense of the divine that forms an intrinsic part of who we are as human beings. This idea is supported in McGrath's work where he follows the Augustinian belief that for the Christian, God 'heals the eyes of the heart', and allows us to 'see' nature in a new way (McGrath, 2009: 39), and as discussed already Plantinga also has developed an understanding of the *sensus divinitatis* that he attributes to both Aquinas and Calvin (Plantinga, 2000: 167-177). Admittedly, this is not something naturalistic science can understand or accept, but it suggests that a Christian approach to science may differ from the naturalistic approach because of what is held to be true at a foundational level, and this may mould how science is conducted.

So there are two points that I want to bring out of Polanyi's work: firstly, that there is a personal element in science involving prior belief; secondly that different communities will have different prior beliefs and therefore begin science from different perspectives. Furthermore, due partly to the influence of Polanyi there is in the work of Kuhn and Lakatos recognition that science often exists within competing research programmes, and I will look at these later works now.

3.2.5. Thomas Kuhn

Kuhn developed his understanding of the methodology of science from his own historical studies (Kuhn, 1970), although some influence also came from the work of Polanyi (who felt Kuhn had not given him sufficient credit) (Moleski, 2006: 8-24). Kuhn believed that science develops from an immature pre-scientific position to maturity as 'normal science' when a community agrees to set aside foundational disagreements and work within a unified sort of social contract based upon a unified foundational commitment (Funtowicz and Ravetz, 1992: 266-7; Kuhn, 1970). Normal science he considered to be an exercise in 'problem solving' and within research programmes there may be a degree of progress towards the development of solutions. Normal scientific research programmes he termed 'paradigms' that include the beliefs of the scientific community that have been moulded by history, shared values and personal experience, as well as scientific observations, hypotheses and experimentation (Kuhn, 1970: 35-42). Kuhn noted though that there is an 'essential tension' within research programmes between the need for innovation and the pressure for conservation. In terms of conservativeness, he saw that there is an inbuilt tendency to ignore difficult phenomena, to be intolerant of alternative theories, and seek to maintain

the status quo by restricting novelty or by maintaining the programme through the addition of auxiliary hypotheses around a core set of beliefs (Funtowicz and Ravetz, 1992: 266-7; Kuhn, 1977: 320-339). Kuhn believed that all observations are laden with theory and that scientists have a tendency to interpret observations in light of the prevailing paradigm. Therefore within paradigms anomalies are not allowed to become major problems if they are seen as being small, but as problems build up a crisis point is eventually reached where it becomes apparent that the paradigm itself needs to be abandoned (Kuhn, 1970: 5, 24, 66-79, 127-128).

There are then periods of rapid change in science that Kuhn saw as being revolutions or paradigm shifts. He saw the progression of science in much the same way as Gould and Eldridge saw the development of evolution in terms of punctuated equilibrium. That is, normal science continues over time in its own paradigm with little change, but sometimes this process is punctuated by periods of rapid change where conflict between competing paradigms becomes the driver for revolutionary transformation in science (Kuhn, 1970: 172-173). However, Kuhn also pointed out that different paradigms are often 'incommensurable': that is, a new paradigm may be so different from the old one that the rules and language of the old system cannot be used to judge the new one. There is a transformation in the way the science is viewed and the language that is used, and in the way questions are asked. Therefore Kuhn believed that it is not possible to compare competing paradigms effectively on a neutral basis because each paradigm carries its own criteria of truth and meaning. He commented that the 'competition between paradigms is not the sort of battle that can be resolved by proof' (Kuhn, 1970: 148). This is because such dialogue is often conducted through misunderstanding as different groups talk past each other. Science then was not considered by Kuhn to provide overall progress towards truth, but should be seen as a pragmatic exercise in problem solving, and although some comparisons with Polanyi's work is evident, Kuhn has been accused of relativism. Polanyi instead desired to retain a commitment to realism believing that science was a search for truth even though containing a strong personal element and even at times reliant upon extra sensory perceptions (Polanyi, 1946: 21; 1964: 15, Moleski, 2006: 8-24).

Kuhn also suggested five criteria for theory choice in science. These he stated as *Accuracy, Consistency, Broad Scope, Simplicity* and *Fruitfulness*.⁴⁸ Although Kuhn saw his criteria as being useful to determine theory choice, he believed that individual scientists would interpret them in different ways because of varying emphases and commitments within the science community. The criteria should then not be seen as firmly established because the practices and beliefs of scientists render them imprecise and subjective. Instead they are really values that influence theory choice (Kuhn, 1977: 320-339). Ian Barbour offers a similar set of criteria to those of Kuhn, involving *Agreement with data, Coherence, Scope* and *Fertility* (Barbour, 1997: 108-110),⁴⁹ but I believe because of the somewhat subjective and personal factors that will influence how these criteria are assessed in different settings it is not possible to use them in an absolute sense. It may though be asked how an Intelligent Design research programme might utilise the criteria? I would suggest that one could find a degree of *coherence* between a belief in order in the physical and chemical laws of nature and design in biological structures because both systems of thought involve the need for order. Finding order in biological structures may also extend the *scope* of that lower level order and thus provide greater *fertility* or *fruitfulness* for science. The question of *agreement with data* and *simplicity* are though more subjective and will likely be interpreted differently by the competing paradigms. It is also noteworthy that science does not extend simplicity beyond what is reasonable, and historical studies show that there are times when the more simple explanation is inadequate and needs to be replaced with a more complex one; as exemplified by the development of quantum mechanics for instance.

3.2.6. Karl Popper

It was the background of logical positivism, the problems of induction and scientific demarcation that led Popper to develop *falsifiability* within the philosophy of science. Popper's main concern was that proponents of scientism and Marxism were only

⁴⁸ The theory should, he believed, conform accurately to experimental findings and observations, it should be internally and externally consistent, it should show the possibility for extension to other areas, it should conform to the idea of simplicity in theory choice, and it should be able to explain existing evidence better, and point to new understandings (Kuhn, 1977: 320-339).

⁴⁹ Barbour includes the need for simplicity within coherence.

seeking confirmation and were thus abusing science.⁵⁰ Marxists were seeking to fit contradictory data into their claims, thus rendering their theory useless as an effective explanatory tool. Those who desired only verification were not seeking truth, and a theory that is made irrefutable through adaptation and reinterpretation should be considered unscientific, or ‘pseudo-science.’ For Popper then it was the application of the correct methodology to science involving falsification instead of verification that provides a valid demarcation criterion between science and non-science (Popper, 2002: 43-50; Balestra, 1999: 350; Johnson, 1994: 145-149).⁵¹

Popper was however open to the possibility of allowing metaphysical claims into science, but only if those claims could be set out clearly enough to be properly tested. However, he believed it necessary to make sense of observations through the development of theoretical models, and that the models themselves are developed out of the creative imagination. Therefore a scientific theory is conjectured as a solution to a specific problem and the theory may prevail for as long as it survives critical refutation (Popper, 2002: 64-66, 70-72; Johnson, 1994: 145-149). This theoretical process of framing laws of nature he saw as being unavoidably dogmatic because the process involves claims about what nature can and cannot do (Popper, 2002: 43-50).

There are a number of problems with Popper’s approach however. Hypotheses are never tested on their own, but within a web of interconnected beliefs and observations as Pierre Duhem for instance recognised. Scientific theories involve a cluster of ideas or beliefs that include hard-core theories, background knowledge, auxiliary hypotheses and specified test hypotheses; and separating them is often far from easy (Duhem, 1954). An experiment then may only reveal a problem within a cluster of scientific hypotheses, but not pinpoint exactly where the problem lies. As a result it is whole bodies or clusters of beliefs that have empirical content and this created problems for Popper’s form of falsification and needs to be taken into account.⁵² There is a problem as well given the

⁵⁰ The scientism of the logical positivists was also of concern as they held to a belief that only objectively verifiable statements could be known to be true. The paradox was though that such beliefs are not objectively verifiable and therefore must lie outside of science (Balestra, 1999: 350-351; Ratzsch, 1996: 104-106).

⁵¹ And he believed that the ‘principle of empiricism’ (or problem of induction) forces us to acknowledge that observations are limited in time and space (Popper, 2002: 44-56, 70-72).

⁵² Quine, as a verificationist, argued along similar lines noting that statements about the world must be judged against experience as a corporate body not individually (Quine, 1953: 41; Atfield, 2006: 52).

tension between the need to defend core commitments sufficiently in order to allow a research programme to be developed, and at the same time to work to refute those core commitments to make the research programme truly scientific as Popper proposed.

3.2.7. Lakatos and Feyerabend

Lakatos was a student of Popper, but was also influenced by Kuhn and he tried to bridge the gaps between the two sets of positions. Like Kuhn he developed his ideas through historical studies, but believed that science was concerned with the search for truth, and was not just an exercise in problem solving (Larvor, 1998: 73). He noted that historically scientists tended to defend their work dogmatically with a hard-core of beliefs that form the protected centre of a research programme, and that this core is surrounded by a weaker protective belt of auxiliary hypotheses that absorb the criticism. Lakatos (and later Popper) further argued that in science theory takes primacy over observation and that the methodology of science, involving conjecture and refutation, usually takes place against a clearly formulated and shared problem (Balestra, 1999: 352). While Kuhn believed that there was usually one dominant paradigm with generally weak competitors, Lakatos believed that history showed that competing research programmes often exist alongside each other for extended periods of time, so the main differences between Lakatos and Kuhn are really to do with the emphasis over the strength of competing paradigms.

For Lakatos, the addition of auxiliary hypotheses to a research programme may be assessed in terms of whether they are *progressive*, *degenerative*, or *ad hoc*. If the additional hypothesis explains the problem and then goes on to make further predictions then it is considered to provide a progressive modification. If it only explains the problem and fails to make further predictions then it is considered ad hoc or even degenerative. Although auxiliary hypotheses are expendable scientists should favour those research programmes that are making progressive hypotheses, and reject those that are degenerative (Larvor, 1998: 52-56; Lakatos, 1978: 8-101, 102-138, 148, 179).⁵³

Misak further noted that scientific beliefs are accepted within a web of ideas with mathematics and logic at the centre, surrounded by theoretical hypotheses, with sentences about observations on the periphery (Misak, 1995: 145; Attfield, 2006: 52).

⁵³ Nancey Murphy comments that Lakatos believed that his own historical work effectively falsified that of Popper (Murphy, 2001: 451-469).

As discussed already, not all philosophers of science have been happy with dogmatism in the methodology of science; Feyerabend for instance was critical of this and argued against methodological monism. However, Feyerabend's approach risks leading to relativism and an unhelpful pluralism, and thus potentially renders science impossible as well (Feyerabend 1975; 2011; Lakatos and Feyerabend, 1999). But in reality there is a difficult tension in all approaches to scientific research programmes, between on the one hand the need to hold to core beliefs dogmatically in order to retain a commitment to truth, and on the other the need to allow pluralism and freedom of thought that allows science to progress. The approach that Lakatos and also Plantinga have advocated involves holding core commitments dogmatically, but allows sufficient freedom for science to advance through a degree of pluralism that may exist in competing research programmes.

There are then a number of statements that can be made from this discussion. Firstly, there is at least some influence from Augustine in the development of research programmes, in for instance Polanyi's writing, but also to some extent in Kuhn's work with ideas deriving from Polanyi's position. Influence from Augustine may also be present in the work of Lakatos due to his affinity for Calvinism, and what I think is of interest from Lakatos is that there would appear to be a degree of coherence between Plantinga's Augustinian science and his proposals. This I would suggest offers some further support to Plantinga's arguments for an Augustinian science, against the necessity for methodological naturalism in science. I believe as well, as I have argued already, that Intelligent Design needs to make some prior core commitments in order for it to be considered properly scientific and that Augustinian science provides an important and useful framework. However, there is another consideration to address now. Nancey Murphy has argued that the work of Lakatos may offer support to Intelligent Design as a *theological* research programme, but not a scientific one. In other words, if we hold Intelligent Design within Augustinian science are we not then making it a theological enterprise and not a scientific one?

3.2.8. Is an Intelligent Design Research Programme Theology or Science?

I have argued that Intelligent Design best fits within the framework of Augustinian science and that such an approach is at least as valid, and usefully less dogmatic, than Ruse's insistence that methodological naturalism is the only way for science. However,

Murphy has been critical of attempts to treat Intelligent Design in a scientific manner, and instead has argued that it should have a place as a Lakatosian *theological* research programme, and that it may even prove progressive in this light (Murphy, 2001: 451-469). So, with this in mind I now intend to consider whether an Intelligent Design research programme should be seen as a theological or a scientific programme.

McGrath has argued for a renewed vision for natural theology as an explanatory system, but within the context of Trinitarian beliefs, and this I believe has some correlation with Plantinga's proposals for an Augustinian science because of foundational commitments in both that arise from Christian doctrines, particularly those of Augustine (McGrath, 2009; Plantinga 2001). For McGrath natural theology can recover legitimacy if it is grounded in Christian doctrines and revelation. His Trinitarian concept therefore differs from the type of Classical natural theology typical of the Enlightenment because it seeks grounding in theology and revelation and not in reason alone. The classical view of natural theology, McGrath points out, was more supportive of deism and doesn't necessarily fit well with a theistic Christian understanding of the world (McGrath, 2009: 35-49). However, it needs to be noted that McGrath's approach is primarily concerned with fine-tuning arguments, whereas Intelligent Design arguments are more concerned with biological structure although I believe they may also be included within an Augustinian approach to science. Although McGrath doesn't go so far as to argue that his proposal should be considered science, there is a desire within his vision to resist the claim that the proposal is merely a theology of nature.

He defends his position by arguing that the Christian faith needs to go beyond personal salvation and the transformation of the soul to include an intellectual transformation of the mind that can then comprehend the created order more clearly. Salvation may then go on and provide healing for an explanatory enterprise (McGrath, 2009: 38-40). McGrath has a valid point here, but there is a sense as well that for the Christian the scientific enterprise is one that seeks to engage with the long-term Judeo-Christian meta-narrative that includes the restoration and transformation of all things in and through Jesus Christ. In other words, science may be seen to have a place in the Church's global mission, but also in harmony with revealed theology. As an example, it is noteworthy I think that Solomon was granted wisdom so that he could govern God's kingdom of Israel in the most appropriate manner. From this it may be seen that scientific investigations that engage with human reason allow us to understand how

creation works and therefore to make wise choices instead of unwise one when considering what actions are most appropriate in the world. So McGrath is I think correct to argue that Christian theology may include an explanatory component, even if it is not the only focus, but that it goes beyond the transformation of the human mind to the transformation of the world; and good science, in partnership with other disciplines, allows Christian believers to fulfil the divine mandate.

McGrath also discusses objections to his approach relating to use of deductive reasoning in the quest to offer proofs for God's existence, and the question of deductive reasoning in science in general (McGrath, 2009: 35-49). The suggestion is that McGrath's approach, that seeks a theological framework to enable understanding and explanation, is much weaker in terms of explanatory power than traditional forms of natural theology (McGrath, 2009: 37). However, as I have already discussed through the thinking of Plantinga, there are good reasons to question the strengths of deductive reasoning because they are only as good as foundational commitments. McGrath points out that even though Swinburne, for example, postulated the importance of temporal order as a basis for evidence of God's existence it is still justified on the basis of simplicity and sufficient reason as prior commitments (McGrath, 2009: 40-45; Swinburne, 2004: 22, 51, 110-132). The problem is that the notion of perfect deduction is illusory because some propositions in all forms of argument, whether in science or theology, must be held without justification. Therefore McGrath is right to maintain that his position, that offers a theologically based explanatory framework on the basis of coherence is a perfectly valid approach to natural theology and avoids problems with deductive reasoning (McGrath, 2009: 40-45). McGrath further points out that the scientific community increasingly sees the 'deductive-nomological' approach to scientific explanation as inadequate and therefore it is gradually moving towards acceptance of abductive reasoning. McGrath notes further in support of his position that Darwin's arguments for evolution were framed in terms of an inference to the best explanation and this has consequences for the way natural theology is understood and conducted (Hempel, 1966: 47-69; McGrath, 2009: 47-49). This I believe offers support to the idea that Intelligent Design may be held within an Augustinian approach to science as well as being a form of Trinitarian natural theology, and it may have explanatory power within such a framework.

Murphy though believes that the Intelligent Design arguments cannot be part of science because science must be purely naturalistic, but she has suggested that the Lakatosian framework might allow it to be considered in terms of a *theological* research programme, and it may even be seen as more progressive than Darwinian explanations if held in this light.⁵⁴ Within the Lakatosian approach a central core of beliefs may be held dogmatically against falsification with dialogue possible over peripheral beliefs that are negotiable and this she argues may be applicable to theology (Murphy, 2001: 451-459).⁵⁵ Murphy would of course be right if science must be defined in naturalistic terms alone, but as I have argued already from the dialogue between Lakatos and Feyerabend, there needs to be room for a less dogmatic approach that provides a degree of pluralism for science to progress. Although individual research programmes need to hold a core of beliefs dogmatically, Lakatos recognised that competing programmes may exist alongside each other for prolonged periods of time (Forster and Marston, 1999: 372-375). Meaningful dialogue therefore really requires a degree of respect across the divide.

Murphy does though concede that science may have taken a wrong direction historically in excluding religious explanations, and part of the reason for this is that scientists such as Robert Boyle and Isaac Newton wanted to protect Christian faith from possible corruption by science. This rejection of theological insights from the process of science she sees as being a fact or even an accident of history, but one that must be accepted in our own time even though there may be regret that science has taken a wrong turn in history. By excluding the activity of divine agency *a priori* from science she believes that Christians, alongside atheists, must now accept the present situation and consider science to be '*methodologically atheistic.*' Appeals to a divine creator are therefore considered out of bounds. However, Murphy does insist that scientific explanations are not necessarily the only form of explanation, and that science needs to be taught in this light (Murphy, 2001: 464). But as a result of the historical error there is now such a

⁵⁴ Murphy criticises Phillip Johnson's approach to falsification (Murphy, 2001: 454-462; Johnson, 1994).⁵⁴ She argues that Johnson had an incomplete grasp of the development of scientific research programmes and fails to mention the work of Lakatos, although Johnson does mention the work of Popper and Kuhn in his analysis. However, Murphy does accept that some of Johnson's arguments are valid, particularly where he criticises evolution as an atheistic metaphysical position (Murphy, 2001: 454-462).

⁵⁵ Ian Barbour has expressed some affinity for this position (Barbour, 1997: 132-133; Murphy, 1987; 1990).

strict separation of science and faith in American politics and education that there is unlikely to be any change in the foreseeable future. Furthermore, because much of the funding for scientific research comes from the American Federal Government there is no prospect for funding religiously based science (Murphy, 2001: 464-465). However, it is noteworthy that this is not an issue for scientists working in many other nations around the world that are not bound by the American Constitution, or in nations that have a different religious background and culture. The idea also that the boundaries of science must be determined by the requirements of American national politics and finance is not really a strong argument to justify the exclusion of Intelligent Design from science.

There is also a real fear of ‘God-of-the-gaps’ arguments within Murphy’s considerations, and that treating Intelligent Design as science might do damage to Christian belief. Science she believes is constantly closing gaps, and these will continue to be closed as science advances (Murphy, 2001: 465). While recognising that this is a serious issue that needs to be addressed, a response based on fear is not one that will advance rational understanding, and I would suggest that some serious thinking is needed in order to resolve the problem effectively. There is though the possibility within an Augustinian framework of holding that the created order is open to direct divine action, although with differences of opinion over the extent of such openness. I will consider the divine action debate in the next chapter, but it is noteworthy that Polkinghorne for instance holds that there may be room for evidence of ‘intentional causality’ in the created order and that science is necessarily limited (Polkinghorne, 1999: 438; Lennox, 2007: 171). John Lennox also believes there is evidence of divine intention in the order, fine-tuning and ‘mathematical intelligibility’ of the universe, and that recent discoveries in biology show that science is opening up gaps in knowledge much faster than they are being closed (Lennox, 2007: 169).

As noted, Murphy does though believe that theological explanations have validity. She accepts Peacocke’s hierarchical structure to the nature of reality with theology considered to be a domain that exists above biology, and where biological explanations are considered to be above those of physics and chemistry. Scientific domain levels are limited both from below and from above (Murphy, 2001: 466; Peacocke, 1971: 85-86;

Polanyi, 1968).⁵⁶ Theology is considered to be at the highest level and she argues is a 'science' that 'studies the most complex system of all – the interaction of God and the whole of creation' (Murphy, 2001: 466). This model she suggests allows for relationships to be considered between the different levels, such as biological science, and theology. In this sense, then, when biological science reaches its upper level of explanation there is another level of explanation that comes into play, and for design explanations this is the level of theology (Murphy, 2001: 466-467). In this regard there is considered to be a theology of 'benevolent Design' that lies beyond and above biology, although not in terms of naturalistic science. If developed into a Lakatosian research programme a theology of design might be seen as more progressive than the evolutionary account that must instead appeal to chance as a metaphysical principle. Atheism, Murphy argues, needs to explain away the strong appearance of purpose and order in the universe, and this may only be possible by the addition of ad hoc hypotheses. A theology of Intelligent Design would need to explain problems such as suffering, but Christian theologians may additionally appeal to a variety of areas such as spiritual experience, human sciences and history (Murphy, 2001: 465-467). In considering the possibility that a theology of Intelligent Design may have explanatory power there is some correlation between Murphy's claims and those of McGrath who argues for Trinitarian natural theology.

However, while Murphy wishes to place Intelligent Design within a theological research programme, Robert Russell is more open to the possibility that theological doctrines may provide feedback into scientific explanations. He suggests that it is possible to use Murphy's proposal for a Lakatosian theological framework and extend it back into the scientific domain where 'theological doctrines' may even provide inspiration for science (Russell, 2008: 21). This would provide some support I believe to the idea that Intelligent Design may have some justification as an Augustinian science, and Russell also offers the possibility that the Lakatosian methodology might help develop the relationship between theology and science along interdisciplinary lines; this he calls '*creative mutual interaction*' (Russell, 2008: 22). I believe this position also correlates closely with the idea that Intelligent Design fits better within Augustinian science because there is a need to recognise that prior beliefs provide foundational commitments within all research programmes. I have suggested that both

⁵⁶ Arthur Peacocke's structure is in fact based upon Michael Polanyi's paper in *Science* 'Life's Irreducible Structure' (Polanyi, 1968).

methodological naturalism and Augustinian science should really be seen as meta-research programmes for this reason, and that Intelligent Design, if held within Augustinian science, can be considered good science.

3.2.9. Summary

In this chapter I have continued to look at the question of whether Intelligent Design can be considered good science. I have accepted that if science must follow the rules of methodological naturalism as Ruse believes is necessary then the answer must be no. There are however questions about scientific methodology that need to be addressed, and about how the Intelligent Design arguments are presented, and it is these two aspects that I have considered in further depth in this chapter in order to see how the Intelligent Design arguments might fit within a modified approach to science.

Plantinga's proposal for a theistic or Augustinian science may offer a way forward in which Intelligent Design might be held foundationally with some prior theistic core commitments. The problem for Intelligent Design as presently presented is that proponents seek to make minimal statements about the designer in order for it to be acceptable to secular science, but this is a weakness that makes it very difficult for the position to be developed into a proper research programme that can then make predictions. Even though it may be possible to accommodate data into a coherent pattern within such a research programme the problem remains. One solution though may be to accept that some prior theistic commitments are necessary, but this would entail a different approach to science, one that allows interaction or overlap with theology. Plantinga's proposal does I believe offer such a solution. So, I have examined Ruse's claims for methodological naturalism in light of Plantinga's proposal, and believe that an Augustinian science has some merit, especially in light of evidence that science has gained heuristic benefit from some theistic beliefs in history. There is as well some support for Plantinga's proposal from the way in which research programmes have been developed, especially with influence from Augustine in the thinking of Polanyi, but also in the work of Lakatos with the understanding that research programmes need to hold core commitments with a degree of dogma.

I have also examined Ruse's insistence that science must follow a purely naturalistic methodology, and noted that such stringent methodological monism suffers from

problems identified by Feyerabend; that is that it potentially restricts progress in science. But on the other hand Feyerabend's own arguments risk epistemological anarchy and relativism and this also undermines science. So, science is then faced with the need to find a middle way between relativism and excessive dogmatism, and one framework that provides a balanced approach is that offered by Lakatos. For Lakatos, some core commitments may be held dogmatically with a surrounding protective belt of auxiliary hypotheses. I have suggested that there is a degree of coherence between the work of Lakatos and Plantinga.

There is a final consideration in this chapter, and that is whether an Augustinian approach to science, that provides a framework for Intelligent Design, would be better seen as theology and not science. Following an examination of the thinking of McGrath, Murphy and Russell, I conclude that it may be held as a theistically informed science where there is overlap or interaction between science and theology, but noting also the prior commitments that exist in all approaches to science.

4. Intelligent Design and Theological Considerations

In this chapter I will consider certain theological aspects of Intelligent Design and ask whether it is good theology. There are three aspects to consider. First is the question of whether we can know anything about the designer from the Intelligent Design arguments; secondly, I will look at the question of divine action, and then in the third part consider the question of suffering in light of design. In the context here good theology is held to be broadly Reformed or Calvinistic theology with its Augustinian influence.

4.1. The Nature and Character of the Designer

4.1.1. Introduction

Mackie's second objection to the design argument follows from Hume and asserts that it tells us nothing further about the nature or character of the designer (Mackie, 1982: 136-137). Other non-theistic models of God might be proposed including polytheism, pantheism, deism, or a power of vegetation or generation, or perhaps the designer might even be embodied (Hume, 1947: 176-181). In response, Intelligent Design proponents do not seem to strongly object, but instead seek accommodation saying as little as possible about the designer. However, this minimalist position, and the continued desire to establish the design argument purely on the basis of science, raises theological difficulties. The arguments are so framed that they do not address one of the central issues for Christian theology that arose through the Enlightenment. This is the idea from, for instance, John Locke's *The Reasonableness of Christianity*, that knowledge of God and of the created order can be gathered purely from within nature using rational thinking, without recourse to divine revelation and the inspiration of the Holy Spirit, or other doctrines such as the need for a prior faith commitment, the doctrine of *imago Dei*, the presence of a *sensus divinitatis*, or the noetic effect of sin (Plantinga, 2000; Moreland, 2009; McGrath, 2009).

McGrath makes strong criticisms of this form of the design argument as part of his attempt to rescue and revitalise natural theology within Augustinian Trinitarian theology (McGrath, 2009: 26-27). The Enlightenment form of the design argument, then, seeks to prove the existence of God through reason and experiential observation of the five senses. And the modern Intelligent Design proponents seem to retain this core

commitment, especially through insistence that Intelligent Design is a science-based enterprise that can establish design without reliance upon theology. Although the minimalist position does have some benefits, because it doesn't seek to develop theology from studies in nature, it doesn't really go far enough because of failure to acknowledge necessary foundational commitments in order to help understand the world. Perhaps Mackie is partly right because we should not try to develop detailed theology from studies in nature, but Mackie's own basis for raising the problem is also foundationally inadequate because it ignores the place of prior commitments in all knowledge claims.

4.1.2. Intelligent Design and Models of God

The Intelligent Design arguments are sometimes presented by proponents, including Dembski and Behe, as a minimalist position that does not make any claim about the identity or nature of the designer. Nor do proponents offer any view on the mechanisms or processes used in the act of creation. Thus it is a minimalist and broad-based position where Hindus, Buddhists, Platonists and Stoics could also potentially be supporters as well as Christian theists. Dembski writes that the

...designer is compatible with the Creator-God of the world's major monotheistic religions...the designer is also compatible with the watchmaker-God of the deists, the demiurge of Plato's *Timaeus* and the divine reason (i.e., *logos spermatikos*) of the ancient Stoics. ...intelligent design does not prejudice such questions as *Who is the designer?* Or *How does the designer go about designing and building things?* (Dembski, 1999: 252).

Later Dembski writes that supporters may include 'Buddhists, Hindus, New Age thinkers, Jungians, parapsychologists, vitalists, Platonists and honest agnostics...' and that Intelligent Design is not dependent on the biblical account of creation (Dembski, 2004: 25, 41). Dembski further believes that Intelligent Design is not even concerned with physical causality, but with identifying intelligent agency, and that as a biological theory Intelligent Design is focused upon offering explanation for the complexity of organic systems, and the 'information-rich structures' of biology. Intelligent Design is therefore empirically detectable using standard scientific methods, and when properly formulated it 'is a theory of information' and one that makes little theological

statements beyond that. Information is held to be a non-material entity, but one that is transmitted through physical processes in the material world. The study is therefore focussed upon ‘informational pathways that are induced by intelligent causes,’ but does not presuppose a creator or the necessity for miracles. As such it is ‘theologically minimal’ (Dembski, 1999: 106-107). Behe agrees that the design inference does not require identification or specification of the designer, and that there can still be a great deal of confidence in the inference to design of complex systems and artefacts even if the designer is hidden from view, or remote (Behe, 1996: 196-197). Behe believes that theological discourse is required to reach a Judeo-Christian understanding of God, but that Intelligent Design takes us only as far as a purposeful agent, perhaps as far as Aristotle’s ‘Prime Mover’⁵⁷ (Behe, 2007: 227-229). However, despite these comments both Dembski and Behe remain Christian theists, even though they don’t think Intelligent Design theory has much to say about God or Christian theology. Confusion arises, however, because at other times proponents do make theological statements. Dembski writes that for theists all disciplines, including scientific ones, should be conducted through the lens of a ‘word-flesh Christology’, as outlined for instance for Christian theology by Karl Barth in *Church Dogmatics* (Dembski, 1999: 206). However, Dembski believes that a lens remains independent of the object of study, even though offering mutual support, where Christ is seen as the *completion* of scientific enquiry (Dembski, 1999: 206-210). There seems to be an ambiguity here, between on the one hand including Christ in science, and at the same time potentially excluding Christ by refusing to identify the designer in science. Instead, a word-flesh Christology, even as a lens, must really provide some shape and direction to science, perhaps even a foundational commitment, and this needs to be acknowledged.⁵⁸

⁵⁷ That is how Behe seems to interpret Aristotle, although Aristotle is generally understood to have proposed an unmoved mover. It is interesting to note that the Intelligent Design proponent John Lennox is much more willing to embrace theological commitments in science and believes that the information in the genetic code lends stronger support to the Judeo-Christian understanding of God as one who spoke life into existence through his Word (John 1:1). Therefore Lennox believes an Unmoved Mover is inadequate (Lennox, 2007: 178).

⁵⁸ Steve Meyer’s position is similar to that of Behe and Dembski, but not quite so strong in claiming the design argument can say nothing about the attributes of the designer, and he recognises that the design inference lends some support to theistic beliefs where design is believed to come through an intelligent and conscious agent who acts mindfully and purposefully. Meyer therefore believes that the inference to design gives pointers to at least some of the attributes traditionally ascribed to God. However, he offers the logical possibility that the designer of biological complexity could still be embodied within the natural

I have already commented that the reason for this desire to avoid religious claims or commitment is due to the political landscape in America where there is a clearly marked separation of Church and State in public institutions. For this reason there is a desire amongst Intelligent Design theorists to present their case with very minimal theological content. However, I believe that proponents do make further claims relating to the nature of the designer that have religious implications. For instance the design arguments are often focused upon ‘machine-like’ contrivances in nature; Behe writes ‘As strange as it may seem, modern biochemistry has shown that the cell is operated by machines – literally, molecular machines’ and that ‘...the bacterial flagellum acts as a rotary propeller...’ (Behe, 1996: 51, 72).

Behe’s comments highlight the way the Intelligent Design arguments are framed. Proponents often make analogies to humanly designed artefacts in their work (even if those analogies are justified in terms of inferences to the best explanation). But there would appear to be an inconsistency here. On the one hand proponents claim that they seek to make no, or minimal, claims about the designer, but then they make use of analogies to human intelligence that appear to be theologically informed. The modern Intelligent Design arguments then appear closer to the type of design argument of Hume’s character Cleanthes. But Hume, in his *Dialogues*, separated the analogical reasoning of Cleanthes (that Demea criticised for anthropomorphism) from the more esoteric position of Philo (Part VII). Hume’s characterisation, through the voice of Philo (VII), made an appeal to the Hindu Brahmins, Plato and Hesiod for the idea that there was an impersonal source or power of generation or vegetation at work in nature (Hume, 1947: 177-180).⁵⁹ So, Intelligent Design proponents in effect are seeking to bring the position of Cleanthes and Philo (VII) together, where they make analogies to human intelligence, but also allow a wide range of possible candidates for the designer,

order (Meyer, 2009: 445). Meyer does though accept that the transcendent attributes of the Judeo-Christian God fully fit the requirements for the designer, but that Intelligent Design in biological structures cannot provide a final proof that such a God is the designer. It only makes the existence and activity of such a designing agent more plausible, and he suggests that it remains logically possible that a being with only some of the traditional attributes of God could also be the designer (Meyer, 2009: 445-446).

⁵⁹ As has been shown above, Erasmus Darwin picked up on this aspect of Hume’s work, and this argument also has similarities with the beliefs of the nineteenth century vitalists who suggested that there was an impersonal vital force, as the *Elan Vital*, at work in nature.

whether that is a personal agent or an impersonal pantheistic force. But these two positions don't really hold together at all well because the actual arguments of proponents in reality appear much closer to the Cleanthes' type of position. This position utilises analogies to humanly engineered systems when describing biological systems, for instance by comparing the bacterial flagellum to an outboard motor. This conflation of ideas that Hume kept separate is, I would suggest, mainly for the reason of presenting their work as natural science, and not religiously informed science, for American public consumption. Instead it would seem that the actual position of Intelligent Design is one that is closer to Cleanthes, and it does not lend strong support to the position of Philo (VII) who argued that order could arise through an *impersonal* force at work in nature.

The interesting claim of Intelligent Design proponents then is that there really is 'machine-like' order within the cell, or real coded information that is analogous to a computer system, and that this analogical reasoning points to *personal* agency as opposed to *impersonal* agency. Intelligent Design then seems to lend stronger support to those Abrahamic religions that believe that humanity is created in the image of a creative personal God, the theological doctrine of the *imago Dei*, as described for instance by Moorland (2009), more than they lend support to other more impersonal pagan conceptions of God. This offers a response to Mackie's claim that the designer could be pantheistic because the Intelligent Design arguments require personal agency as opposed to impersonal agency. Perhaps Hume, if he were alive today, would identify the Intelligent Design arguments as being typical of Cleanthes and not at all compatible with Philo's position.

Intelligent Design is then much closer to Cleanthes than to Philo's (VII) position and attempts to bridge between the two do not lend themselves to good theology. Instead, the position really entails at least some further statements about the designer beyond what is usually claimed by the leading proponents. If on the basis of the belief that design in nature is real then the designer would be a personal intelligent agent who acts with purpose, and from this the designer would seem to possess at least some of the attributes of the Judeo-Christian understanding of God. Intelligent Design theory needs to come to terms with analogical reasoning and theological doctrines, as I will discuss further now.

4.1.3. Theological Problems

A problem remains for Intelligent Design because of a stated desire to establish evidence for a designer independently of Christian theology, but with a desire to offer support to faith. For most proponents this faith is Christianity, but the design argument historically has often been associated with deistic or pagan beliefs about the nature or character of the designer, and Intelligent Design proponents often do not seek to deny this as a possibility.

There are good theological reasons to consider attempts to prove God's existence from scientific evidence to be unsound. Roy Clouser for instance has pointed out that properties such as absolute trustworthiness or self-existence properly belong to God, and attempts to use them independently of God to prove his existence in effect leads to a form of paganism and is idolatry. This is because it takes divine properties and applies them to something in creation. For Intelligent Design proponents there is risk in elevating the created order to a quasi-divine status, and maintaining that religious or non-religious beliefs make no difference to the way nature is interpreted. This places ultimate truth in creation and not in the Creator because it seeks to prove God's existence from natural evidences. Instead, we should recognise that prior beliefs will unavoidably shape the way we view the world and conduct science (Clouser, 2005: 121-122, 194). So, a purely evidential approach to prove or determine the existence of God from nature is misguided; firstly because it cannot completely escape from the reality of probabilistic reasoning and personal belief, and secondly, even if it could escape from that it would then not be a valid Christian approach because it would ascribe to matter, or science, or the scientist, properties that properly belong to God.

The desire to prove or demonstrate the existence of a designer through natural evidences alone stems from flawed Enlightenment thinking that really undermines traditional or religious sources of knowledge such as revealed Scripture and the place of illumination of the heart and mind by the Holy Spirit. Although Intelligent Design proponents have moved away from making detailed statements about the designer the underlying problem remains. Instead, I believe the modern argument would do well to escape from historical problems associated with natural theology and begin with or be supported by religious convictions. McGrath makes criticisms of the Intelligent Design arguments and quotes from John Henry Newman who said; 'I believe in design because I believe

in God; not in God because I see design' (Newman, 1870; McGrath, 2009: 30). Newman was critical of Paley's design argument because he believed it was potentially damaging to Christian faith and thus a liability for Christianity. In a University of Dublin lecture (1852), Newman commented that the 'physical theology'

...cannot...tell us one word about Christianity proper; it cannot be Christian, in any true sense...Nay, more than this; I do not hesitate to say that, taking men as they are, this so-called science tends, if it occupies the mind, to dispose it against Christianity. (Newman 1907; McGrath, 2005: 67-68).

Newman believed that both the capacity of human beings to reflect upon the created order, and the created order itself, had been corrupted by sin as a result of the Fall, and thus any design argument based upon reason and the idealisation of nature was deeply flawed. Nature can only be observed as it is in its fallen state, and the enterprise of observing nature can only discern 'tokens so faint and broken of a superintending design' that the natural conclusion of human beings would lead them away from religious convictions because nature reflects the designer imperfectly (Newman, 1864: 335-336; McGrath, 2008: 204-205). McGrath comments further that Newman was seeking to recapture an older conception of truth that did not rely on reason alone, but on an act of perception that involves, but transcends the human capacity for reason. The heart, Newman asserted, is found by 'the imagination, by means of direct impressions, by the testimony of facts and events, by description.' (Newman, 1870 87-88; McGrath, 2008: 252-253).⁶⁰ There is here I think an acceptance that intellectual knowledge should first rely upon spiritual enlightenment through the Holy Spirit, and Newman believed that the teachings of the Church should involve both reason and imagination, and such teaching may be 'held as a truth' through the 'theological intellect' (Newman, 1870: 89-90; McGrath, 2008: 253). This is reflected in St Augustine's assertions that all intellectual endeavours must begin in faith (*fides quaerens intellectum*).⁶¹ So I believe then that the purely evidential approach that Intelligent Design proponents find

⁶⁰ Newman considered that an echo of design might be found in the beauty of music that descends from a higher heavenly sphere. In a notable university sermon, Newman commented that human emotions and desires for God, that are evoked through the beauty of music, 'are the outpourings of eternal harmony in the medium of created sound; they are echoes from our Home...' (Newman, 1909: 346-347; McGrath, 2008: 286-287).

⁶¹ For instance in *De libero arbitrio* 1-4; 11.2, *Sermones* XVIII.3; XLIII.3.

attractive is not one that can work nor is it one that ought to be used in isolation from the place of prior Christian beliefs and doctrines. Instead, proponents need to address the place of prior belief in their work alongside evidential claims. I am not here arguing that evidence and reason play no part in our understanding of God and creation, but that it needs to be balanced with acceptance of the foundational place of belief in that understanding.

Karl Barth also raised a similar criticism against natural theology. He considered it to be the human attempt to reach out to God in a way that was independent of and apart from reliance upon divine revelation. As such it was considered an approach that sought to develop theology from nature and was therefore human-centred or self-centred in affirming and justifying what is held to be true, instead of setting these needs upon God (Barth, 1957: 54-92; McGrath, 2009: 19). Barth believed that this approach effectively turned theology into anthropology, and was akin to establishing a modern day tower of Babel. God's self-revelation was therefore undermined and the purpose of natural theology, Barth believed, was to try and enable humanity to ascend towards God, or gain some knowledge of God, independently of divinely established pathways (McGrath, 2009: 18-20).

In contrast to Barth, Brunner was not as critical of natural theology. He believed that it could be rescued from Enlightenment thinking and made acceptable to Christianity if grounded in Christian theology. However, Brunner shared Barth's dislike of approaches that were held independently of revelation (Brunner, 1981). Brunner believed instead that natural theology could be renewed within the doctrine of creation, especially in terms of the doctrine of the *imago Dei*.⁶² This doctrine I believe also helps rescue the design argument from the charge of anthropomorphism, that is making God in man's image, because it then becomes a case of holding design within the Judeo-Christian doctrine that mankind is made in God's image. As such the doctrine can provide good theological grounds for the design argument. Brunner accepted that human nature was analogous in some sense to God which allowed a 'point of contact' between God and mankind, and that an ability to perceive something of the divine in nature remained even taking account of the effect of sin. There was then the God given ability within

⁶² J.P Moreland also argues that a combination of the doctrine of the *imago Dei* and what we know about ourselves from an examination of the evidence provides a more satisfactory account than an approach that begins with the naturalistic worldview (Moreland, 2009: 5).

mankind to receive revelation from God. Barth also believed that all revelation must begin with God, but perhaps disagreement arose because of his failure to understand Brunner's position sufficiently (McGrath, 2008: 158-164).⁶³

It is, however, possible to rescue the design argument from criticism of independence from God and anthropomorphism, if it is held within Christian beliefs and doctrines. McGrath follows Torrance in believing that natural theology can be rescued from erroneous Enlightenment thinking if grounded upon divine revelation. Such an approach may then allow it to become a legitimate Christian enterprise (Torrance, 1970). This approach allows a way of 'seeing' nature in light of Christian theology and provides a theological basis for the interpretation of observations. As such it doesn't seek to prove God's existence, but allows spiritual insight to inform the way nature is viewed; as McGrath comments there is instead the possibility of a degree of 'resonance' or 'coherence' between human observation and theory (McGrath, 2009: 20). There is perhaps an iterative process in the idea of resonance between natural theology and observation as well as McGrath suggests (McGrath, 2009: 32-33). In this, we first believe and then find evidence to support those beliefs, and then perhaps refine those beliefs in light of the evidence, and the process goes on, but this process will retain a place for prior belief in how evidence is interpreted.

So in summary of this section, I believe there are good reasons why Intelligent Design needs to embrace foundational theological doctrines in order for it to escape the weakness of Enlightenment thinking and the charge that it is leading away from Christianity. Proponents are using analogies to human intelligence, whether they recognise it or not and this is best understood within the doctrine of mankind created in the image of God. Other doctrines that need consideration by proponents are questions about human perception and the effect of sin, and the strength of a natural awareness of God or *sensus divinitatis*, although I don't have room to consider these in sufficient depth in this thesis.

⁶³ Part of this dispute between Barth and Brunner was to do with political considerations in Germany. Barth was concerned that Brunner's Lutheran theology concerning a natural order in creation, an order that included the relationship between Church and State, gave too much support to the growing Nazi movement in Germany. While I think there is an issue here to discuss relating to Church State relations, this need not necessarily affect the design argument itself.

4.2. Intelligent Design and Divine Action

There is now the need to consider questions in divine action. But first it is necessary to respond to claims made by Intelligent Design proponents that it is possible to detect design in nature in terms of divine intention, and that it is therefore unnecessary to give an account of divine action.

4.2.1 Intelligent Design and Divine Intention

In this regard Dembski believes that the focus of Intelligent Design is really with detecting intelligent causation and not physical causation (Dembski, 1999: 106-107). Behe also wishes to leave open the question of how a divine agent might have acted physically in creation (Behe, 2007: 166). In other words, it is finding evidence that a mind has acted upon matter that is of most interest to proponents without consideration of how that action might have taken place, or giving an account of the ‘causal joint’⁶⁴ involved in divine action. From this, Dembski believes that identifiable marks of design are left behind as bits of meaningful information, as exemplified for instance by the letters and words on the pages of a book (Dembski, 1999: 92-93). Dembski then seeks to develop Intelligent Design into a theory of information and argues that the case for accepting evidence for identifiable information is most compelling when both it is complex and specified; this he terms Complex Specified Information (CSI) (Dembski, 1999: 153-183). There are though a number of ways in which the position of Dembski and Behe may be questioned.

Robert J. Russell doesn’t believe there can be evidence of divine intention in creation, and quotes John Hick’s argument that there must be ‘epistemic distance’ between God and creation. As Hick writes, ‘God must be a hidden deity’ and that the ‘world must be as if there is no God’ (Hick, 281-282, 353; Russell, 2008: 261-262). For Hick this is because humanity must have ‘cognitive freedom’ in order to allow room for ‘faith and moral growth’, and therefore God may be absolved of responsibility for moral evil. Russell also believes that the needs of methodological naturalism demand the exclusion of a ‘divine designer’ in order to make science possible. However, while this position might make the work of science simpler, because it doesn’t then have to relate to an extra dimension of thought, it is hard to believe that God would consider the epistemic

⁶⁴ This is a phrase used by Austin Farrer (1967: 65).

ease of modern science to be a top priority. To claim otherwise would be rather presumptuous. Allowing a divine agent the freedom to act directly in the material world might limit science and make it more complicated, but that won't stop progress, and there are lots of areas of science, such as chaos theory in meteorology for instance, where the science has had to deal with complexity, uncertainty and ontological limits to knowledge. So Russell's argument in support of methodological naturalism is not convincing, but Hick's claim does need a more detailed response.

The claim that God is hidden to allow room for the development of faith and morals may be held generally I believe, but need not be held absolutely (Hick's own belief are also perhaps more subtle than this). Such a position for instance doesn't fully accord with the Apostle Paul's teaching in Romans. Even though Paul writes that the 'righteous will live by faith' (Romans 1:17) his argument in Romans 1:20 is that God's attributes are not totally hidden from view; this because of 'what has been made' (Gk (*poiēmasin*). For Paul this general revelation leaves all people without excuse even in the absence of special revelation. In other words, general revelation offers a natural restraint against moral evil and holds all to account, even though people are not called to live by sight, but by faith.⁶⁵ Although clearly God is invisible by sight there is, I believe, sufficient insight for faith to be held reasonably for those who seek God with sincere hearts. For Paul though it is those with futile thinking who have turned away from God despite the natural knowledge available to them (Romans 1:21). I would suggest then, from Paul's doctrine, that God's handiwork may be sufficiently hidden for the purpose of building faith and 'soul making', but God's handiwork and artistry in creation need not be completely hidden for the task of soul making as Russell suggests from his reading of Hick.

McGrath has also recently attempted to renew a vision for natural theology on the basis of a number of Augustinian doctrines, including the *vestigia Trinitatis*. This is developed within the context of coherence between science and faith through an affinity for fine-tuning arguments, although still giving priority to faith. Alexander further believes that there is a 'biological anthropic principle' that might offer an intelligent design argument of sorts within the context of theistic evolution (Alexander, 2008: 331). Evidence may then have a place, but in subordination to faith. The belief that

⁶⁵ This is also perhaps reflected in the teleological natural law tradition that Aquinas developed from Aristotle's beliefs.

divine marks or footprints exist in creation has a long tradition in Christian thinking. It was in Augustine and Calvin's thinking, and included in Thomas Reid's response to Hume for instance (Reid, 1780; 1872; 1983). However, the belief that there might be evidence of design, or vestiges of creation, was challenged strongly through Darwin's *Origin of Species*. Darwin wondered why a good God would have designed some of the mal-adaptations observed in nature.⁶⁶ As well as evidence of dis-teleology there were also believed to be redundant organs, so called vestigial organs that were claimed to be evidence, or 'footprints,' of an evolutionary progression and not evidence of design. As a result, there was reluctance amongst many later theologians to accept that there is evidence of God's handiwork in creation. But I would suggest that even bad design, or broken design, need not be evidence against design *per se*. There is also the possibility of holding that design in nature is optimal as opposed to being perfect, which reflects Leibniz belief in this world being the best possible given a number of constraints. So, I don't believe that evidence for mal-adaptation in nature should force us to give up on the possibility of finding design in terms of divine intention within a realist, scientific context. But it will force us to ask deeper theological questions about the purpose of suffering in such a context. The designer might have other reasons for allowing natural evil to arise that are not completely understood, such as Hick's suggestion of a school for making souls, and suffering might even ultimately lead to a greater good.

McGrath and Alexander's position offers some support to the claims of Intelligent Design proponents that it is possible to find evidence of divine intention, although it is focussed upon fine-tuning arguments and not the direct organisation of biological structures, but one may ask to what extent some of the Intelligent Design ideas can be understood in terms of the extension of fine-tuning arguments to biology, especially in light of Behe's proposal for irreducible complexity, and Dembski's argument for specified complexity. Fine-tuning arguments generally rely upon the existence of physical and chemical constants that must be very critically constrained in order to allow life as we know it to arise, but this may be extended to biology. Henderson has for instance pointed out that organic chemistry is dependent upon the highly specific, but contingent properties of carbon and water (Henderson, 1913). However, it is also evident from recent work in bio-molecular chemistry that various protein structures require highly specific three-dimensional shapes in order to function properly; with the necessary complex sequence of amino acids coded for in the nucleotides of the genetic

⁶⁶ This followed Robert Chambers, (1844) *Vestiges of the Natural History of Creation*.

code. It is this type of evidence that is of interest to Intelligent Design proponents, but one may ask to what extent does the study of such complex shapes need to go beyond explanations as the level of intention to give an account of how a designer might have acted physically? I would suggest that the Intelligent Design arguments really go beyond the level of intention and involve claims about physical activity; this in terms of what is believed nature can and cannot do. An example would be the arguments for irreducible complexity that by default entail making room for a designer to work. In terms of divine action such an approach looks like interventionism, and would fall within an incompatibilist approach to special divine action, as described for instance by Nicholas Saunders, where God may intervene at certain points in the economy of nature (Saunders, 2002: 21, 45). And concepts such as irreducible complexity do seem to require that there are no causal pathways other than a direct act of God, and this seems a move beyond non-interventionist special divine action.

The Intelligent Design proposition does appear to include a search for divine intention as part of a scientific enterprise with the various objections not completely persuasive. But proponents also go beyond divine intention and make specific claims that seem to lie in the realm of divine action, and this needs to be acknowledged and addressed, especially in terms of approaches to special divine action (I will later consider whether the language and concept of ‘intervention’ is appropriate in this regard).

4.2.2. Intelligent Design and Divine Action

I believe then that Intelligent Design proponents need to engage with the divine action debate and cannot avoid it as they might wish. Before discussing special divine action in greater depth it is necessary to consider the two opposing positions of deism and occasionalism in order to see how they relate to Intelligent Design. Deism holds that a divine agent started the whole of creation running, and then left it to its own devices, much like a mechanised clock. Within such a purely deterministic framework the design is all ‘front-loaded,’ but we may question whether God, or human moral agents, or even sentient animals, have any real freedom to act in this paradigm where all of God’s activity is through the initial establishment of the system of nature in a highly specific and constrained way.

Occasionalism on the other hand maintains that God is directly involved in every action, in both creation and in sustaining the universe, to the point where physical causality does not really exist even if that activity might appear to look like natural regularities and laws. Although two events might appear causally co-joined, that is only because God acts consistently to bring about an ordered world, and the design would derive directly from the mind of God. There is however the danger that occasionalism might undermine the scientific project because a rational intelligent agent may also have good reasons for not always acting consistently (Saunders, 2002: 30-32). There is also the question of whether moral agents have real freedom within a purely occasionalist description of divine action. This is because it risks turning God into a puppet master directly controlling every human action. But the physical world we are presented with in Christian theology is one where God is in control of the created order, but where human beings also have a genuine degree of freedom to act, and where God too has the freedom to interact. There is though a tension between determinism and free will within the history of Reformed thought. John Calvin followed Augustine quite closely in matters of grace and wished to resist three positions in accounting for special divine action (as highlighted in his 1559 edition of *Institutes of Christian Religion*).⁶⁷ These are, a deistic concept of God as a distant, vacant landlord, pure chance, and a stoical, fatalistic determinism. Calvin believed that God's power is ordained (*potentia Dei ordinate*) as opposed to being absolute (*potentia Dei absoluta*) and worked out within the constraints of justice (*Institutes* 1.17.2). Although some of Calvin's followers were less concerned about finding such a just balance and developed for instance the doctrine of double predestination. Saunders believes however that Calvin left himself open to the charge of occasionalism because of his view that God's direct power and activity is present in all events and Saunders believes this raises difficulties for Calvin, particularly

⁶⁷ Calvin wrote that; "For his [God's] will is, and rightly ought to be, the cause of all things that are. For if it has any cause, something must precede it, to which it is, as it were bound; this is unlawful to imagine. For God's will is so much the highest rule of righteousness that whatever he wills, by the very fact that he wills it, must be considered righteous" (*Institutes*, III. xxiii. 2). "Therefore, since God assumes to himself the right (unknown to us) to rule the universe, let our law of soberness and moderation be to assent to his supreme authority, that his will may be for us the sole rule of righteousness and the truly just cause of all things. Not, indeed, that absolute will of which the Sophists babble, by an impious and profane distinction separating his justice from his power - but providence, that determinative principle of all things, from which flows nothing but right, although the reasons have been hidden from us." (*Institutes*, 1.17. 2) (Calvin, 1960).

in theodicy (Saunders, 2002: 30).⁶⁸ It is possible, however, to retain a belief in genuine human freedom within Reformed thought, although this might appear paradoxical to us. I will now look at the problems of deism and occasionalism further in regard to Intelligent Design.

4.2.3. Intelligent Design, Deism and Occasionalism

As science developed in the 18th and 19th centuries there was an increasing tendency amongst scientists to view nature as a perfect machine; one very common analogy being that of a watch or a clock with precise mechanisms; and this suited the deists who held that there was no need for the direct ongoing involvement of God at all in creation. However, this deistic influence in natural theology was leading to atheism (McGrath, 2005: 62). For similar reasons John Henry Newman was also very critical of William Paley's design argument calling it 'physical theology' and asserting that it was damaging to Christian faith and thus a liability (Newman, 1864: 335-336; 1907; McGrath, 2005: 67-68; 2008: 204-205). Historically then, natural theology has often been seen as potentially damaging to theistic Christian belief because it opens the doors to deism, and from this to atheism. In the present time it may be noted that Intelligent Design proponents, as part of their case for holding their ideas as science, leave the possibility of deism on the table and avoid making strong statements about the designer (Dembski, 1999: 252).

Further questions arise though because of the way Intelligent Design is framed. It often appears more like semi-deism where a divine agent acts at some times, and natural laws operate at other times. This is one way of reading Dembski's explanatory filter where he seems to separate design from laws of nature and chance (Dembski, 2004: 75).⁶⁹ Behe also seems to divide the world into those things that can be understood by natural

⁶⁸ Calvin rejected the Stoic belief that God created the present order out of necessity believing that God had greater freedom than this; writing that "What God has determined must necessarily take place, even though it is neither unconditionally, nor of its own peculiar nature, necessary" (*Institutes*, I.xvi.9) (Calvin, 1960). The question of freewill and determinism has often been associated with Calvin with many followers coming down strongly in favour of a belief in the latter although Calvin's own position appears more subtle than this.

⁶⁹ Another weakness of this filter is that it is offering explanations at the level of divine *intention* once *physical* explanations have been exhausted and so it avoids the question of divine action, but this suggests that the filter is not comparing like for like and is incomplete.

processes and those things that are designed (Behe, 1996: 205-206). This has been criticised by Alexander as a god-of-the-gaps argument (Alexander, 2005: 18). Alexander wishes to retain the theistic belief that God is in absolute control, and quotes from Proverbs (16:33) “The lot is cast into the lap, but its every decision is from the Lord.” Divine action then is present even in those events that appear entirely random to us (Alexander, 2005). He believes, rightly I think, that it is wrong to divide the created order into the designed and not designed. However, we need to remember that Behe and Dembski are both fairly conventional theists and they seem to agree with Alexander’s belief that the laws of nature are designed. Forster and Marston offer some defence of Behe and Dembski’s position along these lines (Forster and Marston, 1999: 418-419).

The problem arises for Intelligent Design proponents, I believe, because of the need to separate theological explanations from scientific explanations within the constraints of the American Constitution. But this may lead to a lack of coherence between beliefs in theology and explanations in science if not carefully qualified. However, an approach to design that sees God’s activity in all things, whether it is chance events, natural laws or direct intervention in the world, raises the problem of occasionalism. In this light, nature and human agents would lack real freedom and the notion of physical causality collapses because God then directly causes all physical events, even at the quantum level. The question of openness is though relevant to the question of how a divine designer might interact with creation. In the following section I will look in more depth at the problems associated with special divine action in terms of occasionalism and the openness of creation before returning later to discuss a possible way forward that may offer a theistic bridge between deism and occasionalism.

4.2.4. Divine Action and Openness

There are perhaps several areas where openness to divine action in nature is possible, and Polkinghorne for instance writes that the areas of main interest lie in ‘quantum mechanics, chaos theory and complexity theory,’ although he favours chaos theory as the most promising area (Polkinghorne, 2000: 175; 2005: xi). However, Russell believes the area of openness lies more strongly in quantum mechanics because its apparent stochastic nature gives sufficient freedom for a divine agent to bring about beneficial genetic mutations that may be described in terms of non-interventionist objective divine action (NIODA). An example is the possibility that a divinely

influenced quantum event, such as the radioactive decay of an alpha particle or an x-ray, might cause a specific mutation in the genetic code that is beneficial to the organism. Such mutations may then be reinforced and eventually expressed at the level of the phenotype in the population. In this way, Russell believes that a divine agent could feasibly direct the process of evolution towards a predetermined goal without violating physical laws (Russell, 1998: 215; Saunders, 2002: 113-114). This concept may offer some support to Intelligent Design as I will discuss shortly, but first I will focus upon openness that might arise from quantum mechanics, and note the difficulties that arise in terms of the question of suffering and God's action in creation and what this means for design.

Russell believes that God may be active in all quantum events prior to the development of conscious agents. The concern here is really to provide human beings or animals with genuine freedom, and therefore it follows that God must be self-limited in how he chooses to act (Russell, 1998: 215; Saunders, 113-114). However, by providing openness through quantum events God may be able to bring about specific events that allow the working out of divine purposes in and through creation (Russell, 1997: 48). In this understanding however, Russell doesn't wish to reduce God to the level of just another physical cause amongst causes, but considers that divine action is a wholly different category. The cause of quantum events, he argues, need not be explained by natural processes, and therefore may in fact lie outside of science; thus leaving room for divine agency in creation without breaking any natural law. He argues that quantum physics allows room for the construction of a different and novel form of 'special providence' where the concept of divine intervention in nature is unnecessary, but where God is still able to act objectively in the world (Russell, 1997: 51). His approach may therefore be seen as a matter of God plus nature and not the exclusion of one or the other (Russell, 1997: 58-60). He does though confess that his view of quantum mechanics is tentative and that a new or better theory of may arise in the future (Saunders, 2002: 112).

Murphy however takes a slightly different view from Russell and believes that God must be active in all quantum events so that he is ultimately responsible for all physical activity. In this way divine action may still be considered non-interventionist. As well as desiring to avoid an interventionist and deistic approach to divine action, Murphy also recognises and seeks to avoid the problem of occasionalism, and believes that God may

influence the inherent choices in quantum events without directly causing the event. God is then seen as a necessary part of the physical narrative, but not solely sufficient and is free to actualise particular possibilities that are already present in the quantum states (Murphy, 1995: 343). There is then an attempt to work around the problem of occasionalism, but Saunders believes it is harder for her to escape the charge, although Saunders partly takes this view because of his own more deterministic position on quantum mechanics (Saunders, 2002: 117-118). Pollard though tried to get around the problem by pointing out that human knowledge of the world is limited and does not correspond perfectly with a reality that involves the divine volition acting upon matter. If we could view our situation perfectly from God's perspective, something we can only imagine, then the paradox between freedom and determinism would likely disappear (Pollard, 1958: 138-151). However, this paradox has not been adequately resolved from the human perspective and is related to the unresolved problem concerning predestination versus freewill. As Pollard noted, it is as if we need another dimension of thought in order for it to be resolved. Incidentally, quantum mechanics through the Schrödinger equation does I think provide a useful metaphor for understanding the problem. This is because it contains an imaginary number i , which means in order to understand the equation it is necessary to engage with another dimension of thought, or more easily to square the result thus leading to a probabilistic outcome. The claim that God is especially active in every quantum event, as Murphy has proposed, also raises problems for understanding God's goodness in light of natural evil.

Saunders disagrees with Russell and Murphy and questions whether quantum mechanics really is indeterminate as the Copenhagen consensus suggests, and implies that it can be modelled entirely through deterministic wave functions (Saunders, 2002: 127-172). However, Polkinghorne points out that both deterministic and indeterministic approaches have credible support with disagreement amongst the scientific community over the best approach due to uncertainties. Niels Bohr for instance preferred the indeterminate interpretation, while David Bohm favoured the deterministic approach, and both approaches have some experimental success. So Saunders' criticism against special divine action through quantum mechanics need not hold, although it remains one interpretation (Polkinghorne, 2005: xi).

Miller agrees with Russell that it is possible to construct explanations for the evolution of life that involve divine intention through use of quantum mechanics without breaking

any laws of nature, and this I would suggest potentially offers some support to Intelligent Design. This because it may allow a divine agent to interact with the created order in a more direct, but non-interventionist manner. Miller is though critical of Intelligent Design, particularly Behe's irreducible complexity, because he believes it involves a divine agent interfering or intervening with nature physically. Instead he argues that invoking divinely guided quantum events to account for random mutations would break no rules of nature because such quantum events are not necessarily governed by physical causality and therefore such an approach is consonant with the laws of science. He comments.

The indeterminate nature of quantum events would allow a clever and subtle God to influence events in ways that are profound, but scientifically undetectable to us. Those events could include the appearance of mutations. (Miller, 1999: 241)

Behe's response to Miller is that such an explanation would amount to Intelligent Design and not unguided evolution because it would involve intelligent agency even though it does not necessarily break physical laws (Behe 2004: 358), although this really extends the scope of Intelligent Design some way beyond Behe's more limited argument for irreducible complexity. And this perhaps reflects a difficult tension within the Intelligent Design community because it would seem that the machine-like examples given in support of irreducible complexity require explanations beyond divine intention. The main difference between Miller and Behe here then would appear to be whether the exercise of divine choice in this manner represents a valid scientific explanation or not. But it is further noteworthy I think that Behe goes beyond divine intention and arguments about individual point mutations and believes that the level of explanation required to account for the existence and order of the genetic code would require a designer to act through, at least, multiple mutations. He comments

It [random variation] doesn't explain the elegant, sophisticated molecular machinery that undergirds life. To account for that...multiple coherent genetic mutations are needed (Behe, 2007: 83).

The further question that arises then is whether a divine agent can bring about multiple mutations simultaneously without breaking any physical laws. It is asking whether

Russell and Miller's proposal can be extended to multiple, simultaneous quantum events. I would suggest that there is no logical reason to suppose that multiple events occurring at the same time are any different ontologically to individual events in this regard. If that is all that Behe is proposing then I believe it could constitute an account for Intelligent Design within a non-interventionist approach to special divine action. However, Behe's position entails more than this as he further claims that the evidence lies in the 'sophisticated molecular machinery' of the cell. What Behe also finds fascinating is the three dimensional 'machine-like' protein structures that function as part of highly complex system. I would argue that it is much harder to envisage the emergence of this functional structure in terms of even multiple quantum events and that Behe's position really entails some form of divinely inspired spatial organisation of matter into specific shapes. Behe's claim implies that some form of divine engineering has taken place and Behe's position perhaps looks more like an interventionist approach to special divine action. I will return to discuss this later, but first I want to look at the question of divine action in relation to the notion of the Word of God.

4.2.5. Divine Action and the Word of God

So, a theist's approach to the question of design is faced with the difficulty of holding a position, on the one hand, between the presence of laws of nature that make science possible, but may lead to deism, and on the other hand making God responsible for all that happens which may lead to the abandonment of science and raises questions about the freedom of creation and suffering. I believe though that a way forward in the divine action debate from this that has support from Christian theology is to consider the created order and natural laws in terms of responses to the divine Word. And this is not so alien to science that we should ignore it. The Baconian twin-book approach for instance saw creation as a book to be read in order to discover something of the divine mind, and the concept of a 'law' of nature in fact reflects the idea of a decree or command from an intelligent agent. For instance, a number of Scriptural passages present God speaking creation into existence; 'And God said, 'Let there be light' (Gen. 1:3). Or in Hebrews (1:3), the Son 'sustains all things by his powerful word,' and in John (1:3) the divine Logos is the one 'Through him all things were made.'

Torrance discussed the idea of word at some length in his Queen's University Belfast lectures and argued that there is a strong relationship between word and light in the

created order, even to the point where we can speak of '*luminous Word* or *audible Light*' (Torrance, 1980b: 101). This arises for two reasons; firstly, because electromagnetic radiation provides a medium for carrying information, and secondly, because our understanding of such physical reality is through mathematical functions as well as numbers (i.e. Maxwell's equations or the Schrödinger equation). The world can therefore be understood in terms of word as well as light and is made intelligible through words. He writes that

...the physical universe as it came from the creative intention and power of God is essentially a universe of light...but if its inherent rational order is to be understood it must be brought to coordinate expression in mathematical and verbal form (Torrance, 1980b: 109).

From these considerations the laws of nature may be understood as verbal expressions of divine commands coming from the divine mind. Torrance rejected a strong dualism between the spiritual and material and did not believe there should be division between the natural and supernatural; this because creation should be seen in terms of its dependence upon the divine logos. Natural and supernatural activity may both be understood in terms of responses to divine commands (Torrance 1980c; McGrath, 2008: 78). So, supernatural action can be understood as a divine counter-command to an existing command in nature, but in both instances, the natural and the supernatural, the created order is irresistibly responding to the divine word. And if this is so, then I would suggest that the language of intervention is problematic because all of God's activity in sustaining and creating the world is of the same form; creation responding to the divine word as God *interacts* with and guides the cosmos according to the divine volition. However, we may note that the idea that God might counter-command pre-existing laws of nature has been criticised by those, such as Arthur Peacocke, who believe that God can only work through the processes of nature. The reason for this is because of a strong emphasis upon divine immanence, for instance in Peacocke's Emergentist-Naturalistic-Panentheistic (ENP) approach, where God is seen creating and working within and through natural processes to the point where the laws of nature are considered inviolable. If so, there is no place for a transcendent deity to impose order from outside, but order emerges from within. However, Peacocke also accepted the possibility of a flow of information in some circumstances (as a metaphor) within emerging natural systems, but without the possibility of divine intervention to override the information

pathways (Peacocke, 2007: 12-28; 48-54). Panentheism is, however, far from universally accepted amongst Christian theologians and scientists; Polkinghorne for instance considers that panentheism may be an eschatological vision, but not a present reality, and offers some support to Torrance's position and the idea that creation may be open to ongoing intentional divine interaction (Polkinghorne, 2000: 114-120, 176-177).

There is then a need to balance divine immanence with transcendence recognising that God has the freedom to interact with creation as part of an understanding of divine grace. We may note that the world runs with narrowly constrained laws and regularities, which offers a stable environment in which to live, even if at times a dangerous place, but within this context God may at all time be free to interact within the regular system of nature. So, unlike the deists, Torrance's position holds that God is at all times actively upholding and sustaining the world through his word, but at the same time providing a stable place in which biological organisms can live and thrive. God is also free to act against a previous command at any time, and also gives the created order and moral and sentient agents a degree of freedom. The pressing question in terms of suffering is why God might choose to act directly on some occasions, for instance to save a life, but not at other times. While this remains a difficult question, an approach to divine action in terms of the divine word does I believe offer a way forward that balances between deism and occasionalism. This allows moral agents, as well as God, freedom to act, but provides a stable and ordered world in which to live.

As noted, there are aspects of Intelligent Design theory that offer a theory of information, as exemplified for instance by Dembski's concept of Complex Specified Information (CSI) (Dembski, 1999: 17-18, 153-183). This is reflected most clearly in the idea that the genetic code, specifically the DNA, contains real purposeful information that goes beyond Claude Shannon's statistical theory of information (Shannon and Weaver, 1949).⁷⁰ This suggests that there may be a degree of coherence between Intelligent Design as a theory of information and the divine word of God, if the genetic code is interpreted as a reflection of a divinely inspired coded language. And it is noteworthy that some theistic evolutionists have also attempted to come to terms with the discovery of the genetic code and what it means for science and faith in terms of divine information.

⁷⁰ A similar system is present in Werner Gitt's five level hierarchical model of information involving *Statistics, Syntax, Semantics, Pragmatics* and *Apobetics*, (or teleological aspect) (Gitt, 2003: 50-82).

Francis Collins for instance speaks about the genetic code in terms of language, although seemingly in more analogical or metaphorical terms than Dembski with evident reluctance to engage in the type of univocal language that Dembski utilises. There does seem to be a tension here for theists such as Collins who hold to methodological naturalism and the belief that science and religion are operating in different spheres. For Collins science and religion are seeking to answer different questions and to imply that the genetic code is a direct reflection of a divine word risks violating a tenet of science. However, he is led to compare the genetic code to human language in his book *The Language of God* and to imply that his work in the Human Genome Project is akin to ‘Deciphering God’s Instruction Book’ as one of his chapters is entitled (Collins, 2006: 109-142). He writes, ‘...this book [the human genome] was written in the DNA language by which God spoke life into being’ (Collins, 2006: 123), and that as a ‘first approximation’ it can be considered to be ‘instructional script’ or a ‘software program’ (Collins, 2006: 102). However, this needs to be balanced with comments elsewhere where he speaks about a comparison with language based on metaphor (Collins, 2006: 125). I can’t help thinking that emotionally Collins is quite attracted to the idea that the DNA represents real divine language, but resists taking this position because of what is perceived to be the needs and methods of science.⁷¹ Collins therefore does not endorse the Intelligent Design arguments, and is in places quite critical of it.

He does though wish to redefine theistic evolution in terms of what he calls ‘Bios through Logos’ (or BioLogos), and this implies *life through word*. The reason he gives for this proposed redefinition is that the term ‘theistic evolution’ lacks popular support. He does not reject intelligent design (small ‘I,’ small ‘d’) on the basis of a principled objection, but out of a desire to avoid confusion. Therefore, he maintains that his preferred term of ‘BioLogos’ has distinct advantages in that it ‘expresses the belief that God is the source of all life and that life expresses the will of God’ (Collins, 2006: 203).⁷² Collins then appears to be trying to come to terms with the possibility of evidence for coded information in DNA, but prefers a more equivocal understanding than Dembski. Instead, for Collins, BioLogos is intended to answer the bigger questions

⁷¹ It is noteworthy though that the subtitle of his book *The Language of God* suggests it is possible to find ‘evidence for belief’ and he is sympathetic to fine-tuning arguments (Collins, 2006: 181-195).

⁷² And quotes from John 1:1

that science cannot answer (Collins, 2006: 204). However, I would suggest that an approach to the science-faith interface that allows overlap, such as Plantinga's Augustinian science, can move beyond metaphor towards viewing and interpreting the genetic code as real divine information.

4.2.6. Divine Action and Three-Dimensional Order

I will now return to consider the three-dimensional order found in the cell, for instance in protein structures and highly organised protein systems. This seems to go beyond what can be explained by appeals to wave functions in quantum mechanics alone. And while some genetic mutations in DNA might be explicable through appeals to quantum events, the structure of the DNA backbone, and arguably the overall genetic code itself, is much harder to explain by this means. What is required is another level of explanation. And this is where Behe's concept of irreducible complexity seeks to find a home but how should we understand this in relation to the divine action debate?

In contrast to Behe's claims for irreducible complexity, Alexander reviews the evidence concerning protein complexity and shape and writes that out of the vast number of possible protein molecules there is a surprising constraint placed upon them with the possibility of classifying them into 'only 1,400 protein domain families,' and 200 of these are common across organic life. Therefore he argues that the evolutionary adaptation of protein sequences and their shape has taken place against a highly constrained backdrop, and the same he believes applies to enzymes where 'fitness landscapes' restrict what may arise, thus leading to the possibility that evolution is in part determinate and predictable (Alexander, 2008: 322-326). If Alexander is correct, this would suggest that God has acted to shape the created order by placing restraints in nature that determine the overall outcome of the evolutionary process. He also quotes from Simon Conway Morris' work on evolutionary convergence where it is believed that evolution 'navigates the combinatorial immensities of biological "hyperspace"' An example Conway Morris gives is that of placental mammals in Africa showing independent convergence with marsupial mammals in Australia (Conway Morris, 2003: 127; Alexander, 2008: 326-327). From this evidence Alexander believes that biological systems display the work of an 'intelligence' and have been 'set up' in such an organised way that intelligent life was bound to emerge. However, although he has

some sympathy with design he rejects Intelligent Design considering it to be a god-of-the-gaps argument (Alexander, 2008: 331).

However, we may note that a lot of the evidence presented by Conway Morris and Alexander is uncontested by Intelligent Design proponents and even many creationists, particularly in terms of the possibility of some degree of adaptation through natural selection (Alexander, 2008: 149). The question is though whether this very interesting research goes far enough in explaining the extreme complexity found in the cell. Such complexity involves highly organised protein systems that are interdependent with other protein systems. An example is the adenosine-tri-phosphate (ATP) molecule that is produced by the ATP Synthase motor unit that sits on the wall of the mitochondria. This rotating protein system is driven by hydrogen ions, and generates the molecule ATP that carries energy around the cell to enable other protein systems to function, such as the kinesin ‘walking-transporter’ unit that literally walks along microtubules. A particularly type of kinesin protein unit and a closely related dynein motor are responsible for constructing the bacterial cilia, a type of flagellar, in a highly regulated system (Behe, 2007: 84-102). From this sort of evidence, that goes far beyond this short description, it would be appropriate I believe to talk in terms of a wider cellular *systemic complexity*, although Behe describes it in terms of ‘irreducible complexity squared’ (Behe, 2007: 93).

There have been a number of further attempts to describe the three-dimensional shape of protein structures in terms of naturalistic processes and so avoid the design explanation. We know for instance that the chemical and physical properties of the water molecule can produce the shape of the snowflake, or the shape of organic molecules arises from the versatile properties of carbon. Stuart Kauffman has tried to take this further and offers a number of possibilities towards theories of self-organisation (Kauffman, 2000). This is an interesting area of research, but one may ask whether there is yet sufficient explanatory power to account for the incredible complexity of cellular life. Kauffman recognises the present level of his research and considers it to be ‘serious protoscience’; that is a very early stage of scientific investigation (Kauffman, 2000: 265). Possible ways forward in light of the apparent ‘machine-like’ complexity of cellular life involve yet to be discovered emergent properties that may account for the irreducible hierarchical structure, as proposed for instance by Michael Polanyi and later adopted by Peacocke (Polanyi, 1968; Peacocke,

1971: 84-90). Polanyi was though non-committal about whether the different hierarchical levels could be bridged through emergent naturalistic processes or through a design agent acting upon matter. He proposed for instance the possibility of an ‘ontogenetic emergence’ in nature under the direction of a designing creative agent, although as Clayton suggests Polanyi also left the door open to Bergson’s *élan vital* or the position of Teilhard de Chardin (Polanyi, 1958: 393-401; 1968, Clayton, 2004: 18-22).

Kauffman further recognises the difficulty in describing perfectly through scientific functions and algorithms the processes that take place within the biosphere or cell; this because of the way open thermodynamic systems operate. Such non-equilibrium open systems function like universal Turing machines where it is not possible to state in advance the organisation of the system in terms of its ‘configuration space, variables, laws, initial and boundary conditions,’ and from this he recognises that a general law for all open thermodynamic systems cannot exist.⁷³ Although he postulates that natural ‘self-constructing systems’ may overcome this barrier, he acknowledges that science is forced to rely upon artistic narratives, commenting that ‘Biospheres demand their Shakespeares as well as their Newtons’ (Kauffman, 2000: 3,22).⁷⁴ So, from this I would suggest that there is the possibility of openness towards divine action in how such systems arise and function, and also limitations in how science can model them. If, as Kauffman suggests, science must rely upon artistic narratives, then why should we exclude theological narratives such as Intelligent Design? Such exclusion is really arbitrary based upon the needs of naturalistic science, but no such barrier need exist within an Augustinian science. And in terms of special divine action, I would suggest that within such systems divine action could feasibly be of both a non-interventionist or an interventionist form, and although I believe we may observe design in terms of its similarity to human engineered systems we may not know exactly how such systems arose.

⁷³ Polkinghorne also points out that scientific proofs are necessarily limited following the work of people like Kurt Gödel (Polkinghorne, 2000: 204-206).

⁷⁴ Polkinghorne also writes that the relationship between science and faith may entail what he calls ‘alogical links of consonant relationship’ (Polkinghorne, 2000: 206).

4.2.7. Divine Action, Intelligent Design and Miracles

I will now consider the question of miracles in relation to science and Intelligent Design. In terms of definitions, Forster and Marston's proposal that divides miracles into type i and type ii are useful. Type i miracles closely matches Russell's proposal for non-interventionist special divine action, while type ii miracles are, 'Those which appear to have no possible way to explain them without suggesting an alteration in the usual physical cause-effect sequence' (Forster and Marston, 1999: 132). I have already considered the question of special divine action in terms of interventionism versus non-interventionism, noting the difficulty that such language may present within a theistic context where God is able to bring life into existence through his commanding word. But as well as *word* there is another metaphor in Genesis 2 relating to the action of shaping the animal and human forms (Hebrew *yatsar*) in terms of the work of a potter who creates through the use of *hands*. And this I would suggest may provide a better metaphor for the manner of formation of the three-dimensional biological structures that interests Dembski and Behe. From this Van Till has argued that Intelligent Design really does involve a commitment to a hand-like constructive sense (i.e. type ii miracles) as well as offering a mind-like sense, and Van Till believes that proponents need to acknowledge this (Van Till, 1998: 34-35, 2000: 188-194; Dembski, 2007: 325). This is though something Intelligent Design proponents resist, perhaps because for them it looks too much like creationism. Van Till of course has argued for functional integrity in creation, and Alexander too believes the creation account should not be read in terms of the miraculous, although he maintains that if miracles (type ii) have taken place through creation then Scripture is silent on this matter. He does though believe type ii miracles are possible, but more especially in terms of God's dealing with his people as signs of divine grace (Alexander, 2008: 36-38). But this raises an epistemic problem in science if it is held that type ii miracles are possible. The Christian forced to work under methodological naturalism may be searching for an explanation he or she believes may or may not exist, and this is one reason why Intelligent Design proponents wish to open investigations to other possibilities.

The question of type ii miracles also arises in the disagreement between Newton and Leibniz. Newton believed that God has conferred shape upon space at creation and viewed the solar system as a highly ordered system reflecting the rational mind of God. However, within this system ongoing providential care was necessary, perhaps as minor

adjustments or *reformatio*ns to maintain its order (Hughes, 1992: 1-10; McCalla, 2006: 17, 45). Leibniz though questioned this on the basis that miracles were for the purposes of grace and not for sustaining creation, and that it would be far better to consider the creation as a perfect machine that does not need divine intervention. Commenting through correspondence with Samuel Clark in November 1715 Leibniz wrote that

...when God works miracles, he does it not to meet the needs of nature but the needs of grace. Anyone who thinks differently must have a very mean notion of the wisdom and power of God (Leibniz and Clarke, 2007).

Clark's response however, in a letter of 26th November 1715 in defence of Newton, argued that God must be at work in all of creation and in its ongoing operation and that it is mistaken to think of nature as a perfect clock or machine, because that would be no different to materialism and essentially would exclude God from the world. Instead, Clark believed that creation was continually dependent upon God. He wrote that

...as well as assembling things into structures, he is himself the author and continual preserver of their basic forces or powers of motion. ... The idea that the world is a great machine that goes on without intervention by God, like a clock ticking along without help from a clockmaker—that's the idea of materialism and fate. Under cover of declaring God to be a supra-mundane intelligence, it aims to exclude providence and God's government from the world (Leibniz and Clarke 2007).

Clark is right to argue that it is misguided to separate providence and grace from creation and the sustaining of the world. It needs to be recognised that grace is at work in creation and through the process of upholding the physical world, as well as in the redemptive work of Christ. One may wonder, however, whether Clark's defence of Newton is really in the form of type i miracles as opposed to type ii. Perhaps there is another logical possibility that a divine agent may interact within the world in terms of type ii miracles, but in ways that are scientifically undetectable to us, perhaps through chaos theory or quantum mechanics. However, it might be impossible to tell the difference between type i and type ii miracles scientifically under such circumstances, and preference would arise out of theological considerations, or perhaps through fear of god-of-the-gaps thinking.

Polkinghorne, however, accepts the possibility that causal gaps might exist in the economy of nature, and writes that if the physical world is open from above, ‘and top down intentional causality operates within it’ then gaps must intrinsically exist in a ‘bottom-up’ account to ‘make room for intentional causality.’ Therefore Polkinghorne suggests that theistic scientists can be ‘people of the gaps’ in an ‘intrinsic sense’ and that in this sense ‘God-of-the-gaps’ claims are not improper because science itself is limited (Polkinghorne, 1999: 438; Lennox, 2007: 171). John Lennox also suggests that science should accept the existence of gaps in principle, and notes that biological science is opening gaps faster than they are being closed. He stresses that this is not the flawed God-of-the-gaps hypothesis with its lazy, ignorant approach to science. Instead he believes that this position arises from what is known and through gaps that science opens up; for instance, in evidence for fine-tuning, in the order and regularities of nature, and from the ‘mathematical intelligibility’ of the universe (Lennox, 2007: 169).

Recognition of the existence of gaps though raises the question of impossibilities in science, but Polanyi believed that acceptance of such gaps does have heuristic value. Historically, in physics and chemistry, this approach laid the foundation for some major discoveries; and similarly he argued that recognition of impossibilities in the understanding of biology, in terms of irreducibility to physics and chemistry, will not limit the life sciences, but instead will direct them in a more fruitful direction (Polanyi, 1968). Polanyi further wanted to allow more personal, intuitive ways of knowing into science and he challenged what he saw as the damaging effect of excessive criticism because it often restricts discovery (Polanyi, 1946, 1958: 381).

Finally, I would ask whether special divine action might be detectable, whether through interventionist or a non-interventionist approach. I would suggest as a possibility that an accumulative process may operate where very small invisible steps build up into something that is visible. Polkinghorne offers something similar with the suggestion that ‘creation is not so distanced from its Creator that the character of its history and process affords no clue to the nature of God’s interaction with it’ (Polkinghorne, 2000: 117). Creation may then be considered ontologically open to the possibility of miracles where they are accepted as providential acts, but in ‘unusual circumstances’ (Polkinghorne, 2005: 31). But there is a risk here for Christian theology in that God’s activity has often been considered mysterious without the need for explanations

(Polkinghorne, 2000: 115), and a theology that makes no statements about the physical world can never be falsified. But is detachment from the physical world really in accord with the essence of the gospel? There is a risk for Christian theology in accepting the possibility of evidence for miracles in creation, but I would agree with Polkinghorne that in order to make progress in the relationship between science and theology it is perhaps necessary to take some risks. There is still the open question of understanding how God might bring about three-dimensional shape and complex organisation that forms the central core of Dembski's work and Behe's claim for irreducible complexity. Perhaps though the 'causal joint' will always remain mysterious scientifically. What has been discussed above doesn't fully address this question, although it might offer some insights. Although it might be possible to build some understanding of special divine action at the level of quantum mechanics for instance, the question of how God might confer complex shape and organisation on matter is not easily resolved, although possibly some progress can be gleaned through the chemical properties of water and carbon.

4.2.8. Summary

In this chapter section I have argued then that Intelligent Design proponents do need to take seriously the question of divine action and cannot simply appeal to intention. From this I have considered how Intelligent Design theory might make progress in light of the existing dialogue in divine action. I have argued that the twin poles of deism and occasionalism are inadequate understandings of how God interacts with the created order, and that instead it is necessary to allow both moral agents and the divine agent a degree of freedom to act. However, the question of freewill for moral agents faces an unresolved paradox in relation to determinism, although I believe that God can determine the future even give genuine freewill for human beings.

I have also discussed the place of openness in the created order, through for instance chaos theory or quantum mechanics, that allows God to interact in ways that may be imperceptible to human beings, whether that is through interventionist or non-interventionist approaches to special divine action. An alternative approach involving creation through the divine word was then discussed and it was noted that it may provide a better description of God's activity than existing language. From this I have suggested the language of intervention does not really capture how God relates to the

physical world, and propose that interaction is a better phraseology, although recognising the prevailing language of intervention in the dialogue.

However, I have pointed out that although God may indeed interact with the world through word, the level of cellular complexity that interests Intelligent Design proponents goes beyond what small mutational changes, or even a series of mutations might achieve, even though an accumulation of individual very small mutational changes may begin to look like design. Instead we need to consider the highly complex three-dimensional shape and organisation of the cell. I have suggested that some order arises because of the chemical properties of water and carbon, but still there are greater levels of complexity. An alternative is the idea of self-organisation or design-space, but even these ideas leave a large gap between observation and explanation. Finally I discussed the question of miracles that arises out of this divine action debate and agreed that it is possible to work with the idea of causal gaps in the created order in an ontological context.

4.3. Intelligent Design and the Problem of Evil

4.3.1. Introduction

As discussed already, Mackie supported Hume's Epicurean objection to design concerning the presence of evil in the world if God is considered both omnipotent and good (Mackie, 1982: 136-137). For Mackie, God cannot be both good and omnipotent given the reality of evil. Either God is good, but powerless to prevent evil, or he is omnipotent, but chooses not to stop it, in which case it is asked whether God is truly good. In the mouth of Philo, Hume writes that

Epicurus's old questions are yet unanswered. Is he willing to prevent evil, but not able? then is he impotent. Is he able, but not willing? then is he malevolent. Is he both able and willing? whence then is evil? (Hume, 1947: 198)⁷⁵

⁷⁵ John Stuart Mill put it like this; 'Not even on the most distorted and contracted theory of good which ever was framed by religious or philosophical fanaticism, can the government of Nature be made to resemble the work of a being at once good and omnipotent.' (Mill, 1874: 38). Charles Darwin also included this problem as part of his thinking. Along Darwinian lines David Hull for instance asks, 'What kind of God can one infer from the sort of phenomena epitomised by the species on Darwin's Galapagos Islands? The evolutionary process is rife with happenstance, contingency, incredible waste, death, pain

Christian theologians have made attempts to defend Christian faith in light of the problem of evil and suffering through history, such as the Augustinian free-will defence, where a greater good may ultimately arise out of suffering.⁷⁶ There is also the possibility within Augustinian theology of seeing suffering in the context of a design plan

Of this order the beauty does not strike us, because by our mortal frailty we are so involved in a part of it, that we cannot perceive the whole, in which these fragments that offend us are harmonized with the most accurate fitness and beauty. And therefore, where we are not so well able to perceive the wisdom of the Creator, we are very properly enjoined to believe it, lest in the vanity of human rashness we presume to find any fault with the work of so great an Artificer. (*The City of God*, 12:4).

Understanding suffering within the context of a design plan was also the desire of Leibniz. He believed that God is omnipotent, omniscient and good, and wondered how one might account for moral and natural evil given that God must have known in advance that mankind would disobey God with all that would entail for the suffering and death of human kind. In response he held that the present world is the ‘best of all possible worlds’⁷⁷ Leibniz was mocked for this by Voltaire (through his character Pangloss in 1759 in *Candide*) who saw him as an eternal optimist in the face of an overwhelming problem. But instead, there is an element of hope and character building within the Pauline-Augustinian free-will defence where suffering and death are seen producing greater fruitfulness through inclusion in Christ (Revelation 21:4). There is then, I would suggest, the possibility of identifying some good in the divine plan, and furthermore perhaps finding a measure of coherence between the Intelligent Design of organic life and the overall plan of God.

and horror.... Whatever the God implied by evolutionary theory and the data of natural selection may be like, he is not the Protestant God of waste not, want not. He is also not the loving God who cares about his productions.... The God of the Galapagos is careless, wasteful, indifferent, almost diabolical. He is certainly not the sort of God to whom anyone would be inclined to pray’ (Hull, 1992: 486).

⁷⁶ There is also a question of teleological coherence in the objection if one does not believe evil to exist; as Dawkins writes ‘The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference’ (Dawkins, 1995: 85).

⁷⁷ Leibniz (1710) *Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*.

We ought then, I believe, to take the question of suffering seriously and not use the problem to question the existence of God as the Humean objection seeks to do. Instead, it may be held that we cannot fully comprehend the mind of God in consideration of natural evil and human suffering, although some understanding is possible. There is then an important question of *understanding* in relation to the presence of moral and natural evil in the world, especially as it relates to the design argument. There is, however, the suggestion from Christopher Southgate and Robert Russell that Intelligent Design theory actually makes responses to the question of suffering more difficult, and I will consider this in this section (Southgate, 2008: 19-20; Russell, 2008: 20).

4.3.2. Intelligent Design, Theistic Evolution and Theodicy

Before discussing the relationship between Intelligent Design and theodicy it is first necessary to consider the specific claims of proponents on this matter. However, the difficulty is that Intelligent Design is presented in such a minimalist manner, and the designer is so poorly defined, that evaluation is not easy. For instance, according to Dembski his position does not require the designer to be good, or omnipotent and yet design in nature could still be real. As Dembski has written, the designer could be Plato's Demiurge, where the creation has been left imperfect because of its formation out of a pre-existing chaos; or the designer could be distant and disinterested in the world as deists and Unitarians might believe; or the designer could be the Trinitarian Christian God, both immanent with and transcendent over creation (Dembski, 1999: 252; 2004: 25, 41). Behe is also reticent about identifying the designer as part of his science, although admitting he is a conventional Roman Catholic in his religious belief (Behe, 2007: 228).

Intelligent Design proponents include those who hold to theistic evolution on the one hand, and those who maintain a recent special creation on the other. Therefore, I would suggest that whatever objection is raised on the basis of suffering one could find a form of Intelligent Design argument that might resist that objection. Intelligent Design arguments appear so weakly defined that they are hard pinning down for evaluation on the question of suffering. Southgate however characterises Intelligent Design for the purpose of critiquing it. He sees it as the belief that there are small episodes of divine intervention in the natural world in which God may insert 'modules' of complexity

where evolution is considered lacking in competence (Southgate, 2008: 19-20). Southgate's characterisation is only one interpretation, but it is I believe a fairly reasonable one in light of Behe's argument for irreducible complexity, and I am going to accept it here for the purposes of evaluation. The Intelligent Design position does hold that there are some things that evolution cannot do, and therefore there is a need to allow room for a divine agent to do some things directly, such as inserting modules of complexity into nature in some places. Dembski has also developed his design inference through the use of an explanatory filter in order to find evidence of design once chance and law have been excluded as explanations. This may be seen as dividing creation into the designed and not designed, and at a surface level does not recognise aspects of design in the concept of natural law, nor acknowledge that a divine agent could also be at work through chance processes as well. In other words, it doesn't engage with the possibility of seeing Intelligent Design as being part of the overarching design plan that Leibniz held to, but instead seems to divide the world into that which is designed and that which is not.

However, while Dembski, as a leading Intelligent Design proponent, makes minimal statements about the designer, perhaps because of American political considerations, he has recently developed an interesting response to the problem of theodicy as part of a theological discussion. It needs to be noted though that his approach to the science versus faith dialogue is complex because at times he seems to be advocating a separation between science and faith, while at other times he seeks to develop Intelligent Design as a 'bridge' between the two sides (Dembski, 1999). Dembski's recent work on theodicy seems to hold his theological reflections entirely separate from arguments for or against Intelligent Design, although recognising it as a theological discussion about purposeful divine action (Dembski, 2009: 9-10). It is pertinent to ask though whether such a separatist approach really works.

Dembski's theodicy attempts to hold together two positions that have been very difficult to reconcile in the past. These are, firstly, a scientific commitment to the standard geological timeframe involving billions of years of geological change, and secondly, to hold to a traditional Pauline-Augustinian view of Adam's Fall (Dembski 2009). As such it allows the Augustinian free-will defence to be applied to both moral and natural evil, and so offers an explanation for both physical death and a spiritual lapse. The case for a literal Adamic Fall continues to gain some support from some proponents of theistic

evolution; Denis Alexander for instance follows John Stott in believing that God chose two Neolithic farmers to endow with the image of God as federal heads of humanity; that is Adam and Eve as *Homo divinus*, and he also seeks to retain a place for a Fall from grace that has led to spiritual death, but not to physical death that Alexander believes predates Adam; this position is also supported by Sam Berry (Alexander, 2008: 234-243; Stott, 1972: 63; Berry, 2009: 61-62). It does then attempt to give a reason for the presence of both human moral awareness, and a moral lapse, and this concept of *Homo divinus* may potentially offer some support to Dembski's own work.

Other evolutionary theodicies have been developed in recent years that seek to understand the goodness of God in light of the evolutionary process, for instance in the work of Southgate (2002: 803-824; 2008), and Russell (2008: 212-225; 249-272). The creative evolutionary process Southgate believes produces both good and evil; the good being the creation of organic life, with all its beauty, diversity and complexity; the bad animal and human suffering. And he is right I think to take the question of animal suffering seriously. Although he recognizes that evolutionary processes produce both values and disvalues, he maintains that the values ultimately outweigh the disvalues, and this is the 'only way' in which God could have created a world containing these values. There is then an ambiguity with this evolutionary theodicy, that he recognises, between on the one hand creation seen as very good and at the same time 'groaning in travail.' Southgate however doesn't accept the historical notion of a cosmic Fall linked to Adam believing it to be 'spurious.' Instead, he holds that death and suffering are *instrumental* to the achievement of God's good purposes on the Earth; therefore he offers something like a free-process defence to the problem of evil. God must respect the freedom of creation and shares in its suffering; that is a divine kenosis towards both organic life and inorganic material, in order to give rise to an evolutionary progression and ultimately to human life. Furthermore, science, he believes, has shown that the fossil record is one of violence and death, and a literal reading of the Genesis 2-3 account involving a fall from grace is inadequate, although he retains a belief that moral and natural evil are real (Southgate, 2008: 5, 132). In defence of his argument, Southgate also questions the Pauline doctrine in Romans (5:12) concerning Adam's sin, seeing it merely as a 'lens' through which to view redemption, even though he finds attraction in the Pauline idea that creation is seen as groaning in travail (Romans 8:22). One may ask though whether such an approach adequately addresses Paul's long and

carefully interwoven doctrinal argument in Romans that includes the existence and purpose of suffering. I will discuss this further shortly.

Russell is not convinced that a divine kenosis through evolution, on its own, can offer a solution to the problems of evolutionary theodicy and believes it can only be satisfactorily answered by addressing eschatological considerations as well (as does Southgate to some extent). Russell also wishes to retain some of the aspects of the Augustinian approach, but like Southgate within the context of a non-literal Fall that is instead considered mythology (Russell, 2008: 249-272). In this regard, Russell follows Niebuhr's argument that separates the theological content of Augustine's concern from the literal aspect (Niebuhr 1964; Russell, 2008: 257). But to avoid the Manichean problem that Augustine objected to, Russell responds by quoting Augustine's belief that 'all that *is* is good.' Moral evil then arises out of human freedom because ultimately genuine freedom produces a greater good. In this context evil exists because of a lack of conformity to God's directive will on the part of moral agents and the free-will defence follows. Russell shows how Niebuhr believed that sin is paradoxically 'unnecessary, but inevitable' even apart from holding to a literal Fall. He also follows Niebuhr in arguing that the Pelagian problem, where a literal Fall is dismissed, can be addressed by recognising the need for divine grace to overcome the problem of sin (Niebuhr, 1964: 242; Russell, 2008: 260-261). Russell also believes there is some common ground that can be identified between the theodicies of Augustine and Irenaeus because both perceived evil as arising out of the permissive will of God, and although in both frameworks God is ultimately the source of freedom and its consequences, Augustine sought to absolve God of responsibility for evil by stressing the Fall, whereas Irenaeus emphasized the greater good that comes in the future perfected Kingdom of God, and this then deals with the presence of suffering (Russell, 2008: 261-262). However, we need to be careful with drawing too much distinction between Augustine and Irenaeus in this regard, as A.N.S Lane for instance suggests (Lane, 2009: 130-148).

I will now consider and evaluate Dembski's work on theodicy together with the position presented by Russell, with some consideration of Southgate's work and the position of Alexander and Berry. The main differences that seem to arise out of this are whether it is necessary to hold to the historical existence of Adam and Eve and how we understand the Fall. Although it may not be immediately obvious why this is relevant to Intelligent Design, it is an aspect that Dembski considers in some depth in his writing on theodicy,

and there are questions relating to the way Intelligent Design arguments are framed. There are then a number of questions that need consideration here. Firstly is the Manichean problem and the goodness of God; secondly is the Pelagian problem and whether we can hold to a belief in divine grace while rejecting a literal Fall; also I will consider how the biblical authors understand the Fall; and finally is the question of whether we can apply the physical effect of the Fall (i.e. physical death) retrospectively as Dembski believes?

4.3.3. The Manichean Problem

The first potential problem relating to Intelligent Design and theodicy is the Manichean problem. The Manicheans believed a kingdom of darkness existed alongside the kingdom of light through eternity, although this position was historically expressed in Platonic or Gnostic terms with the spiritual considered good and matter considered evil; and salvation was believed to come through the accumulation of knowledge. Augustine was a convert out of this belief and then proceeded to write against it, for instance in *Contra Faustum*. In his *Confessions* it is also apparent that he was aware of the pride that may arise from viewing sin as separate from the individual,⁷⁸ but more loosely the Manichean belief held that the cosmos is divided equally into both good and evil kingdoms.

In the modern debate on theodicy it is noteworthy that Dembski, in his theological writing, seeks to hold strongly to the Augustinian doctrine that evil arises out of the freedom God has given to moral agents, and that ultimately a greater good will come from this (Dembski, 2009: 5). There is then some agreement on this point between Russell and Dembski, and both wish to hold to aspects of the traditional Augustinian position, although Dembski does so in a more literal manner. However, in earlier writing on Intelligent Design Dembski holds the possibility that the designer could be that of Plato's Demiurge or various pagan or Hindu deities, and therefore a Manichean designer could feasibly be a possibility, in which hypothetical case evil would exist perpetually in an eternal kingdom of darkness, especially if we consider the Platonic and Gnostic origin of Manichean beliefs. If so, it might be concluded that the problem of suffering arises because the designer is inherently evil or powerless, or that the God of the Old Testament was bitter and vengeful and different to the good deity represented

⁷⁸ Augustine, *Confessions*, V.10.

by Jesus Christ. In the more Platonic scheme, evil was believed to have arisen because of the weakness of the designer and the resultant imperfections that arise from creation out of a pre-existing chaos. There are then problems for Christian theology and theodicy because of reticence by Intelligent Design proponents to make strong theological statements about the designer. The pluralism that is entailed therefore leads to a lack of clarity for Christian theology, although elsewhere Dembski offers a detailed Christian theodicy (Dembski, 1999; 2009). Clearly Dembski is trying to walk a tightrope between perceived needs in science and theology, but it is questionable whether it is possible to find a proper balance by compartmentalising the problem in this manner.

4.3.4. Pelagian Related Problems and Divine Grace

There is also a potential problem for Intelligent Design from the thoughts of Pelagius. Pelagius rejected the impact of the Fall for subsequent humanity, both in terms of Adam's guilt and in inheriting Adam's nature, and with influence coming from Stoic philosophy he held that self-effort and education could lead to moral improvement, which essentially denied the need for grace. Although Russell rejects the need for a literal Fall, holding it as mythology, he wishes to retain the core Augustinian belief, against Pelagius, that retains the need for grace (Russell, 2008: 255-258), and this position is supported to some extent by Southgate (Southgate 2008). However, Dembski in his theological writing holds to the literal Fall of Adam and Eve and believes that ultimately both moral and natural evil should be ascribed to the primal sin; thus mankind is held immediately responsible for sin and not God directly, even though the effect of the Fall is applied retrospectively in Dembski's scheme. As noted, some support for this view comes from Alexander, Berry and Stott's belief that Adam's Fall led to spiritual death (Alexander, 2008: 234-243; Stott 1972: 63; Berry 2009: 61-62). Within this understanding, physical death is believed to pre-date Adam and is part of the evolutionary process. It is noteworthy though that this Stott-Alexander-Berry position is somewhat different from the position of Dembski.

The Pelagian problem for Christian theology re-emerged through Enlightenment philosophy, and this has had an impact upon both the design argument and approaches to science in that it tended to deny the need for grace in both. John Locke in *The Reasonableness of Christianity* for instance rejected the ongoing effect of Adam's original sin, believing that people are not born with an innate tendency towards

rebellion and sin. Instead he justified Christian faith through rational thinking and like Pelagius maintained that education alone could bring social improvement and scientific advance (Attfield, 1991: 69-70). Proponents of the design argument subsequently tended to focus upon finding various vestiges, as marks or 'footprints' of design, as rational evidence of design in creation. There was less concern to hold to traditional Augustinian doctrines, such as the noetic effect of sin, the presence of a *sensus divinitatis* or the inner working of the Holy Spirit (Plantinga, 2000: 167-177). The Pelagian problem also reflects the Barthian objection to natural theology in that it becomes an enterprise in which mankind seeks to reach out to God apart from divinely given pathways. The weakness for this approach to the design argument can be seen when the marks or vestiges are questioned, as Darwin's work sought to do. Dembski does however wish to retain some Augustinian doctrines in his theological writing (Dembski, 1999; 2009), and this may offer a basis for a prior commitment to design.

However, in science a godless belief in progress developed that rejected completely the need for divine grace; this most fully realised in Auguste Comte's vision of a religion of science with its own priesthood, usually referred to as *scientism*. Attfield points out that a belief in progress initially had an Augustinian millennial edge that recognised the presence of the Holy Spirit working through the Church, and although I would agree that some modification to the strong Augustinian doctrine was necessary to overcome a tendency towards fideism and fatalism, such modifications led subsequently to the complete rejection of the need for grace in science. Attfield discusses further the problems for society and the environment that have arisen because of this rejection of grace and absolute belief in human centred progress (Attfield, 1991: 67-87). Tom Wright has also questioned the efficacy and legitimacy of an optimistic graceless belief in progress, partly because it cannot deal practically or intellectually with the problem of evil (Wright, 2007: 96-100). Furthermore, I believe we need to recognise the place of grace and the work of the Holy Spirit in healing the heart and mind if we are to make proper sense of suffering. There are then good reasons to recognise the need for divine grace in the perception of design and in science, but Intelligent Design proponents seem to avoid addressing this core weakness of the Enlightenment in their scientific writing, and this potentially leads away from belief in divine grace.

However, Russell believes it possible to retain the core grace-filled part of Augustine's doctrine while holding the Fall in mythological terms. Southgate also believes a literal

Fall is problematic, and therefore should be dismissed. The focus upon evil and suffering in relation to Adam and Eve's sin he holds to be anthropocentric, thus privileging mankind with the suffering of animals of less concern (Southgate, 2008: 41, 153). Furthermore, he wonders whether there can be 'fallenness' in the human condition apart from a literal Fall, but this raises difficulties because evil might then be seen as intrinsic to our creation; instead I would agree with Henri Blocher that evil is ultimately alien, (or 'otherness' for Blocher) to the human condition and that mankind should be seen created in the image and likeness of God for communion with God (Blocher, 2009: 162-164). With the privilege of creation in the divine image comes responsibility and accountability before God, and that to disregard humanity's place because of fear of anthropocentrism raises further problems. Explanations for evil, if removed from humanity, may go on to provide justification for future exploitative action; for example through forms of social Darwinism, or 'greed is good' global capitalism, although clearly Russell and Southgate are not arguing along these lines.

It may be asked further whether the doctrine of the Fall can be disregarded so easily by Southgate when it has been central to the Christian meta-narrative involving a global plan of salvation; this position widely held from the time of the Apostles and Church Fathers through the Reformation to the present day amongst many theologians (Soulen, 1996: 40-48; Wright, 2009: 199). Wright points out that the problem that Paul was tackling in Romans arose in Adam, but the divine solution came through God's calling of Abraham and worked out through Israel and Jesus Christ. It is noteworthy also that, for Irenaeus, the design plan of this economy of salvation was essentially theocentric and not anthropocentric; this because of God's progressive sovereign plan to overcome sin and death. God is then revealed as one determined to redeem Adam and humanity and further consummate the whole of creation in and through Christ. Irenaeus for instance saw the divine plan of salvation, including the Fall of Adam, as the working out of divine justice.

It was necessary, therefore, that the Lord, coming to the lost sheep, and making recapitulation of so comprehensive a dispensation, and seeking after His own handiwork, should save that very man who had been created after His image and likeness, that is, Adam, filling up the times of His condemnation, which had been incurred through disobedience... ..the whole economy of salvation regarding man came to pass according to the good pleasure of the Father, in

order that God might not be conquered, nor His wisdom lessened.... But inasmuch as God is invincible and long-suffering, He did indeed show Himself to be long-suffering in the matter of the correction of man and the probation of all...⁷⁹

It is clear that both Russell and Southgate wish to retain a belief in the reality of moral evil, even apart from a literal Fall, but it may be asked how and when moral awareness and accountability arose in mankind? We generally consider animals to be amoral because they lack awareness of the consequences of their actions, but as a society human beings are held morally accountable. But as well as asking how moral awareness has arisen, we may also ask how humanity came to then choose the evil instead of the good? That is what we may understand as a fall from grace through the exercise of free will. If moral evil for humanity is real, but not for sentient animals, and mankind has arisen through an evolutionary process from the animals as Russell and Southgate believe, then one must surely need to address the questions of how and when human sinfulness arose if the argument is to retain coherence. Peacocke's response to this problem was that self-consciousness and moral accountability arose gradually in the first human beings as they emerged out of the animal community (Peacocke, 1971: 169-170). But it might seem from this that there is an inadequate period of partial moral accountability for *Homo sapiens* as they emerged, although Alexander suggests addressing how this might work out in practice is something we simply cannot know (Alexander, 2008: 243). Alexander, Berry and Stott, instead prefer to hold that at a specific point in time God chose two people to become federal heads of humanity as *Homo divinus*, and then subsequently the Fall led to spiritual death, even if not to physical death (Alexander, 2008: 234-243; Stott, 1972: 63). However, Alexander's position here also raises difficulties about how we should understand the moral accountability of *Homo sapiens* prior to the spiritual calling of Adam and Eve. It also potentially establishes a dualism between spiritual and physical death with the latter explicable through an evolutionary account and the former arising through Adam's lapse. Dembski's approach in his writing on theodicy may though offer different insights to these difficult questions, and I will discuss these shortly.

⁷⁹ Irenaeus *Against Heresies* 3.23.1. Chapter XXIII.—'Arguments in opposition to Tatian, showing that it was consonant to divine justice and mercy that the first Adam should first partake in that salvation offered to all by Christ.'

4.3.5. Evolutionary Theodicy and the Biblical Understanding of the Fall

It is though necessary now to consider the extent to which the Old and New Testament authors understood the Fall. Patricia Williams believed that Paul (in Romans 5:12) misread Genesis and set up a ‘catastrophe’ in juxtaposition to Christ’s work of salvation. Southgate doesn’t follow Williams as strongly in this, but he does acknowledge that he prefers to read Paul’s account in Romans as a ‘lens’ through which to view the meta-narrative of redemption (Southgate, 2008: 28-35; Williams, 2001: Ch.3-6). Southgate questions though whether the Fall narrative is present in the Old Testament texts, as well as questioning whether an historic Edenic paradise can be accepted within a naturalistic scientific understanding of the world (Southgate, 2008: 29). I believe though that Paul’s use of language relating to Adam’s sin is closer to Old Testament usage than this objection suggests and there is some similarity to Second Temple Judaism. The use of the word ‘Fall’ is not directly found in the narrative of Scripture I agree, and is really inferred from the text, but Paul’s comments in Romans 5:12 are in terms of Adam’s sin ‘missing the mark’ (Gk *hamartia*)⁸⁰ in the perfectly ordered *kosmos*, and the ‘missing of the mark’ leads to death (Vine, 1985: 576; Wright, 2007: 192). The inference is that an imperfection entered into that which was formerly properly ordered, although *kosmos* may refer to the human community or to the universe as a whole (Vine, 1985: 685). With this in mind I would suggest the word ‘Fall’ encapsulates the message quite succinctly, just as an arrow that misses the mark might fall to the ground, but we need to consider the wider context of Paul’s message. In Romans Paul can be seen to be expounding from Moses and the Old Testament prophets and this leads to understanding of provisions in the Mosaic Law for obedience for righteousness and disobedience for sin in terms of blessing and cursing (Deuteronomy 11:26; 30:15, 19).

The Fall can also be read in terms of a failure of a priestly service towards God, and this is one of the more interesting ways of understanding the Garden of Eden narrative as imagery relating to temple artefacts and practices appear to be present in the account (Beale, 2004; 2005: 5-31). Beale shows how the account of Genesis 2:15 gives Adam the task of both cultivating and keeping the garden; i.e. ‘...to work it and take care of it’ and also to be in communion with God. The context of the Hebrew language (Hb; *abad* and *shamar*) speak of the later temple responsibility of serving in and guarding the court

⁸⁰ Wright sees sin as idolatry and dehumanising.

according to the Mosaic Law, while the Hebrew word *hithallek* is a reference to God walking in the garden, which is also used to refer to God's presence in the temple before the priests.⁸¹ Adam's responsibility then was to guard the garden and minister before God, and extend the borders of the garden across the Earth through careful cultivation as part of the priestly commission. The Fall then represents a failure to administer this priestly role because of disobedience to God's command. But should this role be seen literally or as a metaphor? It may be noted that references to the third temple in Ezekiel 40-48, and alluded to in Revelation 21, are generally not interpreted by evangelical Christians literally (except for some Christian Zionists). So should we read the Genesis account literally? Although clearly the prophetic passages in Revelation should not be read to imply real physical stones, they do speak of real people being built-up together in Christ to form a new temple, together with a new Heaven and a new Earth. Likewise, Peter wrote that Christians resemble 'living stones' and are 'being built into a spiritual house to be a holy priesthood, offering spiritual sacrifices acceptable to God through Jesus Christ' (1 Peter 2: 5). In other words, it is speaking of a real people of God, as the *Ekklesia*, performing priestly roles in bringing renewed hope and restoration to the Earth as part of a divine mandate. In this sense then I would ask why we shouldn't also read Adam and Eve's priestly role in the Garden of Eden in a similar light? I believe here that Paul's message concerning Adam's sin in Romans is in line with the Old Testament writing, and Dembski is right I think to seek to hold to a literal Fall as the origin of both moral and natural evil.

There is also a need to take seriously the Pauline theology in Romans concerning the place of suffering and physical death in light of Adam's sin, and this may have wider theological implications for our understanding of what it means to be redeemed (i.e. bought back) in Christ. As discussed already, Alexander, Berry, and Stott wish to include a *spiritual* Fall of Adam and Eve as part of their own understanding of how moral evil arose in a world created through an evolutionary process, but they believe the effect of the Fall is spiritual death and not physical death (Alexander, 2008: 244-276; Berry, 2009: 50-74; Stott, 1972). However, Paul's explanation for suffering extends from Romans 5 through Romans 8, and seems to link suffering and death (both physical and spiritual death) to Adam (Romans 5:12-19), and this is supported by a number of

⁸¹ Beale (2005: 7-8) offers these biblical references - Numbers 3:7-8; 8:25-26; 18:5-6; 1 Chronicles 23:32; Ezekiel 44:14; Leviticus 26:12; Deuteronomy 23:14 [15]; 2 Samuel 7:6-7.

commentators; Osborne for instance refers approvingly to Moo's assertion that this passage is speaking about spiritual as well as physical death (Osborne, 2004: 137; Moo, 1996: 320). This is supported by C. John Collins who suggests that Paul's intention was to imply both spiritual and physical death, and that a similar understanding was present in Second Temple Judaism and the Apocrypha (Collins, 2011: 72-76, 80, 83). The French Calvinist Blocher argues the account of the Fall is meant to be read as a historical narrative and that the physical sacrificial death of Christ on the cross overcomes the evil released into the world at the Fall (Blocher, 1994: 132; 2009: 149-172), although it is less clear that Blocher believes that this should be extended to animal suffering and death. There is also in the work of the Alexandrian Church Fathers an understanding that the Fall led to physical death and suffering as well, as T.A. Noble for instance has recently pointed out (Noble, 2009: 120-121). The Greek word for death *thanatos* used in Romans 5:12 is though somewhat ambiguous; it may refer to separation from God (i.e. spiritual death) or to the separation of body and soul (i.e. physical death). Vine though suggests that, in Scripture, death is always seen as the penalty for sin, and infers that to understand the context of Romans 5:12 it needs to be read in light of the wider Pauline passage, particularly verse 18, with consideration that Christ's physical death also entailed a spiritual separation from God on the cross (Vine, 1985: 149). In the same way Adam's death should be seen as both physical and spiritual.

Furthermore, the desire to separate the spiritual from the physical has historically been part of a Greek-Platonic dualistic mindset, and it is unlikely that Paul would have been arguing along these lines (Wright, 2007: 100-103). Instead Paul's position is that the material world was not created in suffering, nor is it inherently evil, but moral and natural evil arose as a result of the human will acting in disobedience to God. So, the physical effect of the Fall shouldn't be collapsed into creation as such alternative positions suggest. The dualistic view may also colour a Christian approach to redemption; Wright for instance has challenged Christians to see the hope of Resurrection in terms of a future physical reality in echo of Paul's argument in Romans 8, and not just view it as an escapist spiritual aspect that is often associated with modern dispensationalism (Wright, 2007: 130).

In Paul's theodicy in Romans 5 there is the hope of resurrection and restoration in Christ.⁸² Paul does see some purpose in suffering because it produces 'perseverance' which leads to 'character' and finally to 'hope' (Romans 5:3-4), and that hope is to be found in Christ whose grace filled act of righteousness leads to resurrection, spiritual life and a redeemed world (Romans 5:18-20). We see in Romans 8:19-21 that the hope of salvation in Christ extends to creation as a whole, and Russell is right I think to hold that the problem of suffering can only really be adequately explained within an eschatological dimension. Southgate though believes that the message of Paul in this passage should be read merely as a 'hermeneutical lens' for an evolutionary theodicy, although the link between Adam's sin, suffering and physical death is broken (Southgate 2008:146). I would suggest though that this understanding fails to capture the essence of Paul's teaching. For Paul, mankind with its Adamic nature is held accountable for sin post-creation, but within some evolutionary theodicies mankind becomes almost a victim of God's powerlessness in creation. But far from being powerless Paul sees God holding creation in frustration and bondage to decay because of human sin.

There is then a problem in understanding the freedom of creation, the divine kenosis of Polkinghorne's free-process defence, in light of Paul's comments that the creation has been placed in bondage to decay (Romans 8:21) because of human sin. In what sense then can we say that the physical creation is truly free? Polkinghorne believes that 'God allows the physical world to be itself' for the purpose of giving creation 'anthropic potentiality' to develop through an evolutionary process (Polkinghorne, 1989: 66-68). But according to Paul the suffering of creation is seen as a testing ground to build godly human character that leads to hope in Christ. John Hick though followed Paul more closely in believing that creaturely suffering provides a school for 'soul making,' although Hick did not appear to address the question of evolution in his writings (Hick, 1966: 253-261). I would suggest however that the eschatological dimension that Russell for instance finds attractive is best understood within the free-will defence because the free-process defence for evil risks undermining the optimistic Pauline theodicy. It potentially restricts a deeper comprehension of the place of suffering in human existence through an understanding of the wider divine plan as it relates to divine omniscience, human free will and suffering.

⁸² Also in 1 Corinthians 15: 20-26.

The idea of creation groaning in travail is also really a metaphor for childbirth in Romans 8:22, where Paul sees the struggle and pain of creation giving birth to a new humanity as the children of God. In this, the creation has been placed in frustration so that humanity may develop towards a divine goal, which in turn leads to the hope of creation being brought out of frustration through a redeemed and renewed humanity in Christ. There is a sense within the Pauline theodicy that there is no easy way for human beings to become Christ-like, as the ‘children of God,’ without going through suffering; that is creation is a place for training human souls towards godliness as Hick and Russell suggest. And there was no easy way for God to bring human beings out of suffering except through Christ’s experience of suffering and death. Mankind cannot truly become Christ-like without suffering, because Christ, as God, has the capacity to experience suffering. Jürgen Moltmann, for instance, rejected the neo-Platonist view of the impassibility of God, as found for instance in Aquinas’ writing, holding instead that God suffers with creation, and this is expressed most keenly through the passion of Christ. Moltmann’s approach therefore draws upon a less equivocal comparison of human and divine suffering, and he also appears to have taken the idea of Adam’s Fall in a fairly literal sense even though seeking to bridge between creation and evolution (Moltmann, 1973; 1993). If so, mankind as created in God’s image, must have both genuine freewill, and the capacity for suffering, because Christ freely chose to enter this world and suffer and because of the covenant relationship in the Trinity we may see that the Father suffers as well. There is a great deal of depth in seeking to understand the divine plan through the free will defence that needs to be taken seriously.

There are then I believe good reasons to hold to a Pauline-Augustinian position regarding the Fall within the context of the free-will defence, but also acknowledging the difficulties this causes because of the way modern science interprets the age of the Earth and evolution. Alexander and Berry have offered a solution to the presence of spiritual death and moral evil through the notion of Adam and Eve as *Homo divinus*, but what of physical death and natural evil? By linking Dembski’s scheme to Alexander and Berry’s position it may be possible to give an account for the presence of physical and spiritual death, and moral and natural evil, within the Pauline-Augustinian position, and perhaps within the scope of modern science. I will now turn to evaluate Dembski’s scheme in greater depth.

4.3.6. Dembski's Pauline-Augustinian Theodicy

While Alexander holds to a spiritual Fall, but not to a physical Fall, Dembski wishes to retain a place for the spiritual and the physical in regard to Adam's sin. The way this is done involves a novel response that seeks to retain two positions that have historically been difficult to reconcile. That is, the Pauline-Augustinian belief that Adam's sin is ultimately responsible for both natural and moral evil, and spiritual and physical death, together with the generally accepted geological timeframe. Therefore this approach potentially coheres with both theistic evolutionary accounts of the origin of life as well as to various forms of creationism and Intelligent Design. Dembski does this by allowing the Fall to be applied retrospectively and divides time into *chronos* and *kairos*, where *chronos* is concerned with the temporal order and *kairos* relates to an invisible divine purpose that is interwoven with it, although acting at a different level where God is not bound by temporality (Dembski, 2009: 124-130). Time, as *chronos*, is then a bottom-up causal-temporal way of viewing the cosmos, while *kairos* is top down as the intentional-semantic view, thus reflecting a form of dual action in the world (Dembski, 2009: 131-137)

Part of the justification, for Dembski, is through an extension of Calvin's covenantal theology relating to Christ's redemptive work. Calvin believed that Christ's work of salvation applied to those who lived both before and after the crucifixion, and Dembski believes that such retroactive action can be applied to Adam's Fall because it too has a *kairos* aspect as well as being a temporal event; so God allowed suffering into the world in anticipation of, and prior to, Adam's sin. Dembski points out that similar ideas were present in some theological discourses before Darwin in response to the scientific acceptance of long geological ages. In this light, natural and moral evil were both attributed to Adam's lapse (Dana, 1846: 296-320; 1853: 521; Hitchcock, 1851; Dembski, 2009: 110-111, 213-214). Dembski quotes Jay Dana

If sin could be pardoned in view of a foreseen offering which should atone for its guilt, than a foreseen offence may be made a reason for accommodating the physical conformation of things to such an event.

So, we may ask whether there are any problems with applying the effect of Adam's sin retroactively? Firstly, I would question whether Adam's Fall can be applied in this way,

or whether the human cause and the spiritual effect are constrained by the forward progression of time? Is humanity for instance theologically bound by times and seasons where the consequences of Adam's sin must be applied after the event? The difficulty with answering this question is assuming we might know the mind of God on this matter. So I would suggest the possibility remains open, even if it cannot be established with certainty. It also raises the problem that for a time between gaining the status of *Homo divinus* and the Fall, Adam and Eve would be in the curious state of being both un-Fallen and at the same time subject to the Fall, if it is applied retrospective, unless for a time God suspended the effects of sin for them. There is also another related problem that arises if the purpose of suffering in the world is both to bear witness to the damaging effect of sin, and through suffering to build human character. Why would animals need to suffer if Adam, Eve and their human descendents were not at that time in existence? A response might be that the fossil record provides additional evidence of the damaging effect of sin to human beings, although for much of human history the fossil record has not even been of interest or properly studied, so a difficulty remains here I believe.

There is a further question that ought to be addressed. How does Intelligent Design, if it includes retroactive fallen significance as part of its defence, respond to some of the problems that Southgate's evolutionary theodicy addresses? The question is; why would God choose to intervene and prevent suffering at some points by inserting modules of complexity, but not intervene at other times because the evolutionary process must be left to do its work unhindered? (Southgate 2008: 19-20). Of course we may ask the same question today; why does God allow one child to die of hunger in one place, and another somewhere else to be well fed? In light of this we may note that the question of suffering remains ultimately unanswered. But returning to the question raised here, I would argue that it is possible, within Dembski's framework, to separate out the good of creation, and / or the creative process, from the moral and natural evil that can be attributed to Adam's sin.

In responding to this question I believe it is first necessary to differentiate between the claims of evolution. Natural selection can be viewed as separate from the other pillars of evolution involving common ancestry (and not all Intelligent Design proponents accept common ancestry), and random mutations. It is though noteworthy that the scientific evidence for natural selection is largely uncontested by all sides, an example would be

the changes to the beaks of Darwin's Galapagos finches (Grant and Grant, 2006: 224-226), although it may be noted that neo-Darwinists and Intelligent Design proponents may interpret the significance of the evidence differently. However, within an Intelligent Design paradigm, natural selection through survival of the fittest could be seen as a *conservative* property that enables species of animals and plants to adapt to the pressures of changing environments, although individual animals would still be subject to suffering and death. So, this could be interpreted as a sort of inbuilt design resilience, and in that light it may be seen as being good for species to survive rather than not survive even if individual animals die. This natural *sustaining* conservation process may also maintain bio-diversity and the colour and beauty of the world we live in, but it need not be seen as being ultimately *creative* and the death entailed in the process may be attributed to Adam's sin if applied retrospectively.

This then leaves a further question relating to how we understand random mutations and evolution. To characterise the neo-Darwinian paradigm; mutations can be harmful, neutral or beneficial, with beneficial mutations far less frequent than harmful or neutral ones, but the beneficial ones provide raw material for the engine of evolutionary change. It may be feasible within the Intelligent Design paradigm to view the harmful mutations as evidence of the Fall, with the beneficial mutations seen as evidence of God's goodness, bringing greater order into the world through the exercise of creative divine choice. However, Behe suggests that at the present time even apparently beneficial mutations appear random. For instance, a mutation hemoglobin C-Harlem that protects against malaria, and has fewer anemic side effects than other sickle cell mutations, appeared in New York and not in Africa where it would have been more beneficial (Behe, 2007: 28). But it remains possible within Dembski's theodicy for God to have intervened periodically to bring about beneficial mutations, whether point mutations or the insertion of larger macro-mutations as modules of complexity such as the bacterial flagellum as part of the good divine plan, while the harmful mutations may be attributable to Adam's Fall and human sin. I offer this as a possibility without necessarily endorsing it myself.

If this is so, then the bacterial flagellum, which provides a means of propulsion to the bacterium (as an example of a module of complexity) may be seen as beneficial because it is surely better for it to have some means of locomotion than not. However, there has been strong disagreement over how the bacterial flagellum has arisen. Ken Miller

argues that the Type III Secretory System (T3SS) of the bubonic bacteria is a stepping-stone in an evolutionary pathway that can then account for the complexity of the flagellum, as studies suggest the T3SS is formed by many of the same proteins as the flagellum (Miller, 2004: 86; McNab, 1999). The T3SS is a rather harmful protein system, as it enables the pathogenic bacteria to breach the cell wall of the host and secrete poisonous proteins into the cytoplasm. If Miller were correct about the T3SS, then it would suggest that God has deliberately created the pathogenic bacteria through the good creative process, which raises problems for theodicy. However, similarities between the T3SS and the bacterial flagellum don't tell us much about the order of descent. It remains possible that the T3SS has formed from a broken flagellum and not the other way around.⁸³ Behe suggests as a possibility that it is failure of this flagellar system due to a harmful mutation that may give rise to the T3SS (Behe, 2007: 261-268, 304). If that is so, it would fit with Dembski's belief that natural evil is a consequence of Adam's sin and not part of the good creative process, although there are many other examples that ought to be considered, and this line of reasoning is at present not conclusive with problems remaining in theodicy.

4.3.7. Summary

I started by noting the Humean-Epicurean objection to design on the basis of suffering that was relayed through Mackie. In response, I considered the validity of the Augustinian free-will defence to suffering and noted that Dembski's theodicy follows this line of thought. Dembski attempts to hold to a Pauline-Augustinian approach to suffering while retaining a commitment to the standard geological timeframe, and from this I asked whether it can offer a better solution to the problem of suffering than various evolutionary theodicies that have been developed by, for instance, Southgate, Russell, Alexander and Berry.

There remains strong support amongst a number of Reformed theologians for the Pauline theology in Romans, and this theology includes physical suffering and death as a result of Adam's sin. This needs to be taken seriously in the development of a modern

⁸³ Behe notes further that the flagellum (and similarly bacterial cilia) is far more complex than recently thought with the system constructed systematically through 'intraflagellar transport' that includes walking protein motors such as dynein and kinesin-II. The flagellum base also includes a pump that is used in the construction of the unit (Behe, 2007: 88-92, 261-268).

theodicy. In support of this Dembski's scheme can potentially provide an alternative to evolutionary theodicies and link physical and spiritual suffering to Adam's sin (as well as potentially offering dialogue and support to Intelligent Design and other forms of creationism). Dembski's novel response to suffering applies Adam's lapse retrospectively and is justified on the basis that creation possesses both a chronological and kairological aspect where God has subjected the cosmos to suffering in anticipation of human sin. Although this position is not without problems, it may be applicable to various positions in relation to origins.

One major problem though is the question of whether Adam's sin can be applied retrospectively, or whether human action must always be applied prospectively; this question is not yet resolved. It may though I believe be possible to differentiate between the good of the creative process, from the natural evil that would be held to the human account. This approach would consider beneficial mutations, whether as single units or as modules of complexity, to be part of the creative process, while harmful mutations would be attributable to the Fall. I have given an example where I think this might work, but recognise that further examples are necessary to build the case further. So, it may be possible to extend Dembski's scheme to that of Alexander, Berry and Stott's idea, which sees Adam and Eve as federal heads of humanity (i.e. *Homo divinus*), but extending it to include physical death as a result of the Fall. From this discussion I have suggested that Dembski's theodicy may offer a way forward for Intelligent Design, but that there is a stronger need to hold the wider claims for design within an Augustinian paradigm because outside of such a framework serious problems remain for Christian theology.

Russell I think rightly points out the need to consider the eschatological dimension and also finds attraction in Hick's belief that the purpose of suffering in the world is to educate human souls towards godliness, and this coheres with the Augustinian free-will defence. Partly for this reason I am less convinced that the concept of a divine kenosis towards creation and the free-process defence work, and would question whether creation can really be seen as free in light of its present subjection and bondage to decay.

5. Conclusion

In this research I have endeavoured to answer two questions. Firstly, can Intelligent Design be considered good science, and secondly, can it be considered good theology? My conclusion is that there are problems in both science and theology because of the way the arguments are framed. This is primarily because Intelligent Design proponents make minimal prior theological commitments concerning the designer and this makes it difficult to assess scientifically. This minimal approach also raises difficulties for Christian theology. I have, however, suggested that Intelligent Design may be rescued in both science and theology if it is held within an Augustinian framework.

I started by analysing Hume's *Dialogues* because this provides a useful means of understanding and illustrating the shape of the debate and the different positions (Hume, 1947). In this work there are three central characters, but four positions. Cleanthes' position mirrors the classical design argument and is apparently based upon an analogy to human intelligence. Demea prefers ontological and cosmological arguments, but also believes God is so exalted as to be unknowable, although people may feel the truth of religion in their hearts. Philo argues from an Epicurean position generally, but also ponders the possibility (in Part VII) that the designer could be a power of generation, from for instance the Greek poet Hesiod, or the Hindu Brahmins (Hume, 1947: 176-181).

Intelligent Design arguments in effect bridge between the positions of Cleanthes and Philo (Part VII) because proponents fail to identify the designer and allow for other possibilities from Greek and Hindu thought. I have argued instead that it would be better theologically to bring the positions of Cleanthes and Demea together by making prior commitments to Christian doctrines, such as mankind created in God's image from Cleanthes, and an innate sense of divinity in Demea's speech. However, it follows from this that Intelligent Design would then start from a prior commitment to design because of an emotional and intellectual sense that arises naturally in the hearts and minds of believers. But is this scientifically acceptable?

John Mackie, writing in *The Miracle of Theism* (Mackie, 1981), identified a number of problems for the design argument from Hume's *Dialogues*. These were seen as hurdles that must be jumped over in order for design to be acceptable as good science and

theology. Firstly is his claim that the design argument is based only on a weak analogy to human intelligence; secondly, that there are other non-theistic explanations such as embodied agents, polytheism, pantheism, deism, or vegetation or generation that might impact upon design. Thirdly is the question of how the existence of the divine mind ought to be explained. The fourth question is related to suffering and the goodness of God, and fifthly is the question of the importance of explanatory power in science (Mackie, 1982: 136-137). These five hurdles provided the basis for discussion in the scientific part of the thesis although with additional consideration from Michael Ruse's belief that science must follow the rules of methodological naturalism, which would exclude Intelligent Design by default (Ruse, 2001). Responses to Ruse were provided for instance by Plantinga (2001), Lakatos and Feysabend (1999), and Polanyi (1946; 1958; 1964).

5.1. Is Intelligent Design Good Science?

The first criticism from Mackie's thinking is the claim that the design argument is only a weak analogy to human intelligence. Swinburne has offered a detailed response (Swinburne, 1979; 1991) but it is questionable whether his work offers much support to Intelligent Design because his arguments are focussed mainly upon the temporal order of cause and effect, instead of the spatial order inherent in the Intelligent Design arguments. A better way forward is to follow Sober's line of reasoning in which the design argument may be framed as an inference to the best explanation (Sober, 1993; 2007). Intelligent Design proponent Steve Meyer generally supports this (Meyer, 2009), but such inferential reasoning can only be established probabilistically. Another response to the criticism that analogies are weak is found in the medieval debate from for instance Duns Scotus and Aquinas. If the design argument begins from prior Augustinian doctrines, such as the *Imago Dei*, then there is a move towards more univocal and literal language where necessary differences are seen in terms of scale and not kind between mankind and the designer.

Although Sober believes that the design argument can potentially be justified through inferential explanations, the real difficulty he believes for Intelligent Design relates to the question of explanatory power and testable predictions (Sober, 2007). This correlates with another of Mackie's claims against design, and I considered this in the third chapter.

The question of explanatory power and testable predictions is related to the question of scientific methodology, and in the start of the third chapter I considered whether Intelligent Design needs to meet Ruse's criteria for methodological naturalism, or whether another approach is possible (Ruse, 2001). I accepted that if Ruse is correct then Intelligent Design cannot be good science because it entails the work of a supernatural designer, but one may ask whether there are other ways of doing science. In response I looked at Plantinga's claim that theists may begin science from religious presuppositions; this he calls Augustinian science, although it is developed within the context of Reformed theology (Plantinga, 2001).

In comparing the two approaches of Ruse and Plantinga it became clear that they suffer from what Kuhn called incommensurability (Kuhn, 1970: 148); that is a failure to not understand each other's argument. Ruse for instance defends his work by appealing to the weight of scientific evidence, while Plantinga questions foundational commitments and asks whether these are properly justified scientifically. Plantinga doesn't believe naturalistic commitments necessarily hold true, and argues that theistic presuppositions in science are at least as valid as naturalistic ones. From this he believes Christians can bring knowledge gathered from faith into science in those areas where there is a perceived clash with theology; one notable area is concerned with what it is that makes us human, although this is not exhaustive and I have proposed that Intelligent Design may also be developed within Augustinian science.

I also looked at the wider question of method in science and considered the dialogue between Lakatos and Feyerabend in relation to the place of dogmatism versus relativism (Lakatos and Feyerabend, 1999). It is relevant to note that the Calvinist Lakatos was the one who upheld methodology in science while Feyerabend moved towards relativism because of fear that dogmatism hinders scientific progress, although more loosely Feyerabend may be interpreted to imply that there can be no single method in science. The outcome of this dialogue offers some support to Plantinga's appeal to Augustinian science because of Feyerabend's rejection of a single method, and Lakatos offers the possibility of holding a core of beliefs dogmatically out of concern that relativism will undermine science; this because our understanding of truth will then be rendered incoherent. There is however a need to avoid excessive dogmatism with an Augustinian approach, although Plantinga doesn't wish to stop others from doing

science in their own way. Lakatos also wishes to strike a balance in science between excessive dogmatism and relativism and we are led to accept the possibility of a degree of pluralism in science with an ensemble of different outcomes, and these will be dependent upon prior core commitments. This allows a place for Intelligent Design in science, but with the need to make some prior core commitments concerning the nature and character of the designer even if these are theologically informed. Furthermore, proponents of methodological naturalism cannot claim their approach is the only way because such a position would be strongly dogmatic and therefore restrict discovery in science.

In the second part of this chapter I considered in further depth the possibility of developing Intelligent Design into a research programme as part of Augustinian science, although noting the difficulty with objectivity when design is intrinsically linked to the way human beings make sense of the world. As such the Intelligent Design approach to science may really be in the form of a self-evidencing explanation, although as McGrath noted, Darwinian science is also often justified on a similar basis (McGrath 2009, 89). However, this dilemma may be overcome if it is recognised that science must begin with prior commitments.

I then reviewed the work of Polanyi (1946; 1958), Popper (1966; 2002), Kuhn (1970; 1977) and Lakatos (1976; 1978) in order to see what issues may arise for the development of an Intelligent Design research programme. It is clear that there is already an Augustinian influence in the development of research programmes from Polanyi's writing. He believed that scientific methodology involved striking a balance between intuition and criticism, although recognising that different societies will likely reach different conclusions about what is true because of prior faith commitments (Polanyi, 1946). Some influence from Polanyi extended through Kuhn, although Kuhn saw science as about problem solving and not necessarily a search for truth. Lakatos though was committed to truth in science, and believed that this necessitated holding a set of core commitments dogmatically. From this I have argued that there is nothing inherently unscientific in Augustinian science although recognising that it might be more appropriate to speak about it in terms of a meta-research programme; methodological naturalism may also be seen in the same light because it too involves prior metaphysical commitments. A meta-research programme is seen here as a framework with a set of prior core commitments from philosophy or theology that make

science possible. Both positions may though individually restrict what is discovered in science, but progress may arise out of a degree of pluralism if there is open dialogue in the scientific arena between both sides. But in contrast, Murphy believes that the work of Lakatos may provide a basis for holding Intelligent Design as a theological research programme, but not a scientific one, although Russell is more open to the idea that theological commitments may inform science (Murphy 2001; Russell 2008).

So, in conclusion to the question of whether Intelligent Design can be considered good science, I would suggest the main problem is that as presently set out it fails to make sufficiently strong statements about the designer that might allow it to be predictive and therefore be developed into a proper scientific research programme. This follows Mackie and Sober's criticism. Because of this Intelligent Design risks the problem of relativism in science, and this was the concern of Lakatos because science would not then be a truth seeking exercise. However, I see no reason why Intelligent Design cannot become predictive in principle if proponents begin to make prior statements about the nature and character of the designer. Such statements though will look like theological statements, which is something Intelligent Design proponents resist. However, it may be possible to justify this within the framework of Augustinian science as a meta-research programme. I have argued further that Ruse's methodological naturalism cannot be used to dismiss Augustinian science because that would be excessively dogmatic and restrict discovery and scientific progress as a whole, as Feyerabend's arguments against methodological monism implies.

5.2. Is Intelligent Design Good Theology?

The second main question is whether Intelligent Design can be considered good theology. I looked at this in relation to three questions in the fourth chapter, and for the perspective of this research I considered good theology to lie within the context of Reformed theology, particularly aspects of Calvinism with its Augustinian influence. The first theological question raised was whether it is acceptable to make minimal statements about the designer and whether we can develop knowledge of God apart from revealed theology. The second question revolved around the divine action debate; the third question considered the problem of suffering and theodicy.

To start then I looked at the claims of Intelligent Design proponents relating to our understanding of who the designer is. I showed from a number of quotes from Behe and Dembski that they seek to make minimal statements about the nature and character of the designer allowing for all sort of possibilities that potentially lead away from a Judeo-Christian understanding of God (Dembski, 1999: 252; 2004: 25, 41; Behe, 1996: 196-197). But in their work they are more willing to use analogical language (usually in a univocal or literal sense) that compares biological structures to humanly engineered machines. These are in effect indirect statements about the nature and character of the designer, particularly in relation to mankind created in the image of God. Intelligent Design proponents then need to address an apparent discrepancy between indirect statements and direct statements.

I then looked at a number of historical objections that will likely have a bearing upon the modern version of Intelligent Design. Barth for instance was critical of purely evidentialist approaches to natural theology because he saw it as a tower of Babel enterprise (Barth, 1957). That is seeking to ascend towards God apart from divinely appointed pathways. It is a reflection of human pride and stems from flawed Enlightenment thinking, for instance from Descartes and Locke, that we can somehow prove the existence of God through reason alone. Instead, as John Henry Newman has pointed out Christian truths come through revealed Scripture and the work of the Holy Spirit and that our mental ability is in reality dulled by sin (Newman, 1864: 335-336; 1907). The un-regenerated mind may then struggle to see design in creation. Plantinga has also argued from the writing of Aquinas and Calvin for the recognition of the presence of a *sensus divinitatis* within the human person (Plantinga, 2000: 167-177), and from this it may be seen that an awareness of design arises out of prior religious convictions, and not the other way around as Intelligent Design proponents propose. Clouser has also suggested that the very attempt to prove God's existence from evidence gathered in nature in effect idolises nature and science (Clouser, 2005: 121-122, 194).

However, it may still be possible to rescue Intelligent Design theory if it is held within a prior religious framework. Torrance argued that there is still a place for natural theology if it begins from prior Christian commitments and this is supported by McGrath who suggests that natural science may be used legitimately in this endeavour in order to develop a degree of coherence with revealed theology (Torrance, 1970: 121-135;

McGrath, 2009: 20). McGrath's main interest is various fine-tuning arguments, but I see no reason in principle why this cannot be extended to include the Intelligent Design position that involves three-dimensional biological structures.

I then turned to consider how Intelligent Design ideas might relate to the divine action debate. Firstly, I noted that proponents' main focus is upon divine intention instead, although I don't believe this is altogether valid because their claims do involve statements about three-dimensional shape and not just a search for evidence of intent. Also, the design argument has historically been associated with deism, although deism does not necessarily follow and it is possible I believe to frame Intelligent Design in theistic terms. I looked then at Intelligent Design in relationship to divine action considerations within a theistic context, particularly the framework of Augustinian-Calvinistic theology. Calvin believed that God's power is worked out through divine justice and that this is ordained power as opposed to absolute power (Sudduth, 1997). In theism God is generally seen as being both immanent with, and transcendent over creation, and this potentially leaves a degree of openness to special divine action, whether that is seen as interventionism or non-interventionism. Calvin also wanted to avoid deism, and tried to find a balance between fatalism and blind chance, although Calvin has been accused of occasionalism, for instance by Saunders, (2002: 30). Occasionalism is the belief that God causes all events to the point where creation and intelligent agents have no real freedom. There remains though a paradox between determinism and freewill within Christian theology that is recalcitrant to resolution and this needs to be acknowledged.

Scientific discoveries have I believe shown the world to be open through for instance quantum mechanics and chaos theory, as Polkinghorne (1989: 66-68) for instance observes, and this potentially weakens some deistic arguments that appeal to fine-tuning in the laws of nature. Instead, it is possible for a divine agent to be active in time to bring about the observed order of the world in terms of special divine action in ways that are of a non-interventionist form, although that does not rule out interventionism. But I would question whether the language of intervention is appropriate bearing in mind Torrance's suggestion that there should be no division between the natural and the supernatural because both are of the same form; that is creation irresistibly responding to the divine word (Torrance, 1970; 1980b). Instead I would suggest divine interaction is more appropriate. Saunders though questions whether quantum mechanics is truly

indeterminate as some physicists hold, although this question remains unresolved with continued disagreement on this matter amongst physicists.

Torrance's approach to special divine action involving responses to the divine word may offer a way forward for understanding Intelligent Design in relation to divine action (Torrance, 1980b). For instance, light or sub-atomic particles may be described by mathematical functions within quantum mechanics (i.e. the Schrödinger equation). Through this a divine agent may be able to interactively modify a wave function through a divine word whether quantum mechanics is held in determinate or indeterminate terms, and this may be possible in scientifically undetectable ways. And such events at the quantum level may go on to influence apparently random bio-molecular mutations, for instance through the emission of alpha or beta particles in radioactive decay. This may then influence the occurrence of biological mutations and this may offer some support to Intelligent Design as Behe suggests, although Miller disagrees (Behe 2004: 358; Miller, 1999: 241). While I have offered some sympathy to Behe on this matter, Behe's own claims seem to go beyond what individual point mutations might be able to achieve and really involve at least multiple point mutations, but more realistically entail three-dimensional shape and 'machine-like' complexity. The possibility that the genetic code is a reflection of a divine word has also been raised by Dembski who has suggested that Intelligent Design is really a theory of information (Dembski, 1999: 17-18). Francis Collins has also found attraction in this idea, although within a less literal context preferring instead to understand it in metaphorical terms (Collins, 2006).

However, as noted Intelligent Design theory really goes beyond information to three-dimensional shape and highly complex and ordered systems. Interestingly, another metaphor in Genesis 2 is that of God as a potter who brings shape to the human and animal forms through use of divine *hands*, then breathing life into Adam and the creatures. This may offer scriptural support to the idea of God bringing shape and form to creation, although the actual 'causal joint' of how that might be brought about remains mysterious. Such a reading does however potentially offer a place for seeing the miraculous aspect of creation, although noting that there may be emergent properties as yet undiscovered. But the characteristic of highly complex organic systems that are not in equilibrium is that they defy prediction, which leaves a question mark over whether science can ever fully determine how life arose. As Kauffman notes this really

requires us to use narratives in order to make progress, and I have asked whether an Intelligent Design narrative can really be excluded from such a discussion (Kauffman, 2000). I don't see any reason why Intelligent Design cannot be considered good theology as part of the divine action debate if proponents are willing to move beyond statements about divine intention and also acknowledge their comparison of biological systems with human machines. Neither do the arguments need to be framed in a deistic or semi-deistic manner because there is scope for recognising divine interaction in creation.

Finally I considered the question of divine justice in light of suffering; that is the theodicy question. Although I looked briefly at the Epicurean objection to design from Hume, the more comprehensive question comes through the thinking of Leibniz where God is seen as omnibenevolent, omnipotent and omniscient. The question is then why God created the way he did knowing mankind would sin, with all that would entail in terms of suffering and death. There is then a question about the overall divine plan, and my own preference is to follow Hick in seeing suffering is unavoidable as a school for improving souls, but also having sympathy with Moltmann that the question revolves around the capacity of God to suffer, as evidenced especially in the death and passion of Christ (Hick, 1966; Moltmann, 1973; 1993). In this way we move beyond the impassibility of God, to a God who shares in the suffering of mankind and the world. Furthermore, it is as if mankind cannot become truly like God except through suffering because God has the capacity to suffer. God could make Adam and Eve *very good*, as creatures living in innocence, but suffering is necessary for full maturity and perfection in Christ. But how does this relate to Intelligent Design?

I noted the difficulty with Intelligent Design arguments because of the unwillingness of proponents to make strong theological statements that can be assessed. However, Dembski has recently offered a detailed theodicy along the lines of Augustine and Calvin (Dembski, 2009). I considered then Dembski's work alongside Southgate and Russell's thinking (Southgate, 2002, 2008; Russell, 2008), noting potential problems for Intelligent Design, for instance from Pelagianism and Manicheanism. The Pelagian error was to deny grace and the effect of the Fall upon human life believing instead that mankind could self-improve through training and education. There is I believe an aspect of Pelagianism in the Enlightenment through a tendency to overlook human weakness and the noetic effect of sin, and deny the need for grace, this from the time of Locke

onwards. Intelligent Design proponents though tend not to challenge this aspect of the Enlightenment, which I think is a major weakness. I have already discussed this in relation to the Barthian objection to natural theology, and offered a way forward by acknowledging the need for grace and the work of the Holy Spirit, including the place of scriptural revelation in our understanding of God's plan. The failure to make strong statements about the designer may also lead to the Manichean problem in that suffering might be seen to arise out of a realm of evil that exists perpetually alongside a world of good, or the designer might be something like Plato's demiurge creating the cosmos out of pre-existing matter. These are inadequate for Reformed Christian theology, but Dembski's theodicy is more strongly Augustinian because it seeks to place responsibility for spiritual and physical death upon Adam's Fall. He does this by dividing time into *kairos* and *chronos* and believes that the experience of animal and human suffering and death may have been active prior to the cause due to its kairological significance; in a similar way to Calvin's teaching that Christ's redemptive work was active amongst the Old Testament people prior to the crucifixion. This is potentially in accord with some forms of theistic evolution, for instance with Alexander (2008), Berry (2009) and Stott's (1972) argument for *Homo divinus*, although it is not without problems.

Alexander, Berry and Stott argued that Adam's Fall led to spiritual death and not physical death, and that death is part of the natural evolutionary process. However, a significant number of Reformed theologians, such as Osborne (2004), Moo (1996), C.J. Collins, (2011) and Blocher (1994; 2009) continue to believe that Pauline theology included both physical and spiritual death. Dembski's work does at least provide a possible way forward to hold to both the standard geological timeframe and to an Augustinian-Calvinistic understanding of the Fall. Although Alexander, Berry and Stott's scheme may offer some support to Dembski's ideas there remain significant differences. Dembski's scheme does potentially provide a way forward that might help to bring Intelligent Design within the umbrella of good Christian theology, although a number of problems remain.

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