

INTELLIGENT DESIGN: A THEOLOGICAL AND PHILOSOPHICAL ANALYSIS

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Academic dissertation to be publicly discussed, by due permission of the Faculty of Theology at the University of Helsinki in Auditorium XIV (Unioninkatu 34), on the 22nd of October, 2014, at 12 o'clock.

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Abstract

Intelligent Design (ID) is a contemporary attempt to defend the idea that the order of nature bears marks of its Creator. The movement began in the U.S.A. during the 1980's and 1990's, and its claims about the relationship of theology and science, and its critique of evolutionary theory have caused much controversy. This study is a theological and philosophical analysis of ID's design argument and its presuppositions. ID is contrasted with naturalistic evolutionism and theistic evolutionism, and related to the broader discussion of natural theology. The study attempts to provide a more balanced and nuanced view of both the strengths and weaknesses of ID's argumentation than much of the previous discussion. The study's main focus is on increasing understanding of the ID movement's argumentation, but some evaluation of the arguments of the discussion is also included and criticisms are developed.

ID's design arguments are quite minimalistic, not aspiring to prove the existence of God, but merely of an unidentified intelligent designer of cosmic and biological teleology. It also emphasizes the scientific nature of its design argument. Consequently, much discussion has focused on the question of whether ID is better understood as part of the natural sciences, or as philosophical-theological idea. Though this study also considers this philosophical question, it also emphasizes that it is not the central question of the debate, since good arguments are not restricted to science. So, it is more interesting to ask why people believe or do not believe in the designedness of the cosmos and how good the arguments for each view are. The definition of natural science is a side-issue in the discussion of these questions.

The study argues that ID's design argument is best understood as an inference to the best explanation that is supported by the analogy between nature's teleological order and the teleological capabilities of minds. The credibility of this design argument depends not only on our philosophical and theological background beliefs, but also on the empirical evidence. Theological and philosophical a priori -considerations arguments are not sufficient to settle the debate on ID apart from empirical study of what the world is like. Nevertheless, the theistic and naturalistic worldviews that have been defended in the discussion are not based merely on scientific data, but also on philosophical, metaphysical and theological considerations.

While emphasizing its scientific nature, the ID movement also seeks to build bridges between science and religion. Rather than conflicting with each other, ID argues that science and theology support each other, when they are rightly understood. Though this study supports the basic premise that there can be mutually beneficial dialogue between science and theology, it also warns against emphasizing the importance of scientific arguments to such an extent that the broader metaphysical, philosophical and theological nature of the doctrine of creation and the value of non-scientific arguments is forgotten. The study also argues that contrary to some of ID's argumentation, one can believe both in divine design and Darwinian evolution at the same time. This compatibility thesis can surprisingly be argued not only on the basis of broader theological and philosophical arguments, but also on the basis of the ID movement's own ideas.

Tiivistelmä

Älykkään suunnittelun liikkeen (Intelligent Design, ID) pyrkimyksenä on puolustaa ajatusta, että luonnonjärjestys sisältää merkkejä jonkinlaisen luojan toiminnasta. Liike on saanut alkunsa Yhdysvalloissa 1980- ja 1990-luvuilla, ja sen väitteet luonnontieteen ja teologian yhtymäkohdista sekä sen esittämä evoluutioteorian kritiikki ovat herättäneet runsaasti kiistaa. Tämä tutkimus analysoi liikkeen käyttämiä keskeisiä argumentteja ja niiden taustaoletuksia. Tutkimuksessa älykkään suunnittelun liikkeen ajatukset asetetaan osaksi laajempaa keskustelua teologian ja luonnontieteen suhteesta. ID:n ajattelua myös verrataan vaihtoehtoisin näkemyksiin, erityisesti naturalismiin ja teistiseen evolutionismiin. Tavoitteena on näin analysoida älykkään suunnittelun argumenttien vahvuuksia ja heikkouksia aiempaa keskustelua tasapainoisemmalla ja tarkemmalla tavalla. Tutkimuksen pääasiallinen tavoite on älykkään suunnittelun liikkeen argumentaation ymmärtäminen, mutta se sisältää myös keskustelussa käytettyjen argumenttien arviointia ja kritiikkiä.

Älykkään suunnittelun liike painottaa argumenttiensa tieteellistä luonnetta, ja katsoo argumenttiensa pystyvän lähinnä jonkin tuntemattoman suunnittelijan olemassaolon todistamiseen. Aiempi keskustelu on usein keskittynyt kysymykseen siitä, tulisiko ID ymmärtää osaksi luonnontiedettä vai teologis-filosofiseksi ajatukseksi. Tämä tutkimus sivuaa myös tätä filosofista kysymystä, mutta painottaa, ettei luonnontieteen määritelmän tulisi olla keskustelun keskeisin kysymys, sillä hyvät perusteet eivät rajoitu vain luonnontieteen sisälle. Sen sijaan on olennaisempaa kysyä, miksi ihmiset uskovat tai eivät usko luonnon suunnitelmallisuuteen, ja kuinka hyviä kunkin näkemyksen puolesta esitetyt perusteet ovat. Tutkimuksessa tuodaan esille, että kaikki keskustelun osapuolet hyödyntävät merkittävässä määrin myös filosofisia ja teologisia argumentteja ja oletuksia. Juuri näihin asioihin liittyvien kysymysten analysointi on nostettu tutkimuksessa keskeiseen asemaan.

Tutkimuksen mukaan ID-liikkeen suunnitteluargumentti onärkevintä ymmärtää parhaaseen selitykseen tähtääväksi päätelmäksi, jota tuetaan analogialla luonnon päämääräsuuntautuneen järjestyksen ja mielen kykyjen välillä. Suunnitteluargumentin uskottavuus riippuu filosofisista ja teologisista taustaoletuksista sekä käsityksestä luonnontieteellisestä todistusaineistosta. Keskustelussa esitetyt maailmankuvat eivät siis perustu vain luonnontieteen tuloksiin, vaan myös filosofiseen, metafyyssiseen ja teologiseen pohdintaluun.

Vaikka älykkään suunnittelun liike korostaa tieteellistä luonnettaan, se pyrkii myös rakentamaan siltoja luonnontieteen ja uskonnon välille. Teologia ja luonnontiede eivät liikkeen mukaan ole vihollisia, vaan tukevat toisiaan, kunhan ne vain ymmärretään oikein. Tämä tutkimus tukee sitä perusoletusta, että luonnontieteen ja teologian välillä voi olla molempia hyödyttävää vuorovaikutusta. Samaan aikaan tutkimus kuitenkin varoittaa painottamasta luonnontieteen merkitystä teologialle niin paljon, että luomisopin laajempi metafyyssinen, filosofinen ja teologinen luonne ja ei-tieteellisten perusteiden arvo unohtuu. Tutkimus osoittaa myös, että jopa älykkään suunnittelun liikkeen ajattelun sisältä voidaan löytää mahdollisia perusteita harmonisoida näkemys luonnonjärjestyksen jumalallisesta suunnittelusta ja darwinilaisen evoluutioteorian hyväksyminen.

Acknowledgements

The discussion on Intelligent Design is controversial and the rhetoric is often volatile. Someone like me, who finds both something to like and something to criticize in Intelligent Design, can feel like a “lonely duck”, as theologian Thomas Jay Oord has stated.¹ With my dissertation, I am joining this society of lonely ducks.

As I begun writing this study, I expected to produce merely something like 250 pages of analysis. However, unentangling the complex issues eventually required much more space. My colleague Antti Mustakallio encouragingly stated that since almost nobody (besides the official examiners) will likely read the entirety of the work anyway, writing a longer dissertation should not harm anyone. Perhaps the depth of the study can even be a good thing. Accordingly, I have sought to make each chapter of this work at least somewhat comprehensible even if read in isolation.

I wish to thank the people and institutions that have helped in the writing of this study. Several people have devoted hours of their time to discuss philosophy of religion, dogmatics and the natural sciences with me, and for this I am deeply grateful. My supervisors Pauli Annala and Leo Näreaho provided good guidance and support for the overall project, Professors Miikka Ruokanen and Pekka Kärkkäinen, the Custos for the final dissertation, supported the project faithfully through to completion. My supervisors and professors, the Faculty of Theology and the Finnish Doctoral Programme of Theology and my colleagues have created an intellectually stimulating environment that is open to different approaches, and for this I am very grateful.

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In a study on this kind of topic, international connections are highly beneficial. In spring 2014, as this project was nearing completion, I had the opportunity to be a visiting scholar at the Center for Theology and the Natural Sciences (Berkeley, California). The

¹ Oord 2010.

guidance and encouragement given by theology and science veterans Robert J. Russell, Ted Peters and the rest of the fine folks at the GTU was invaluable. Earlier versions of some arguments were also presented at several conferences at the Ian Ramsey Centre, Oxford, and I am grateful for the excellent discussions I have had at this centre. As a young scholar, opportunities to connect with the worldwide theology and science -community have been invaluable.

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September 6, 2014 in Espoo

Erkki Vesa Rope Kojonen

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1. INTRODUCTION

1.1. Questions, Method and Structure

The Purpose and Methodology of this Study

Already in the classical era, many people felt that the useful arrangements, rational ordering and beauty of the cosmos testify to the existence of some sort of Creator, and this intuition remains widespread today.² This study is about the debate on Intelligent Design (ID), a contemporary attempt to argue that nature indeed contains evidence of design by an intelligent mind. ID formulates this idea as a *design argument* in the light of the natural sciences. However, ID is not the only way to defend the rationality of belief in the Creator, and many claim that its approach is misguided. Many even argue that the progress of the natural sciences reveals only a godless universe of chance and necessity without purpose. This disagreement invites the question: What is the scientific, philosophical and theological basis of these different interpretations of nature?

The purpose of this study is to systematically analyse the Intelligent Design movement's design argument and its theology as it relates to this argument. Though the movement itself emphasizes its claimed scientific nature, the focus of this study is primarily theological and philosophical rather than scientific. Because of ID's controversial nature, the movement's thought will be contrasted with theistic evolutionism and atheistic naturalism. The discussion on design and the relationship of science and religion has a long history, and my analysis will situate ID in this context. Results of this analysis are relevant for the discussion on Intelligent Design as well as for the more general discussion about the relationship between the natural sciences and Christian theology.

The primary goal of this study is to form a general understanding of the structure of Intelligent Design thought and its relationship to central competing views. More precisely, the main questions of this study are the following:

1. What is the structure of the Intelligent Design movement's design argument and what are its central concepts and presuppositions?
2. How does Intelligent Design relate to theistic evolutionism and naturalistic evolutionism on the question of design?

My method for answering these questions is systematic analysis, meaning the analysis of the concepts, arguments and presuppositions of Intelligent Design. Though I will evaluate and

² Perhaps interpreting nature in this way is simply natural for our sorts of intellects. See chapter 4.1 and McCauley 2012 for further discussion.

criticize arguments in the process of mapping the theological and philosophical landscape of the ID movement's thought, I must nevertheless emphasize that this study is not an evaluation of ID's claimed research programme. That would require a different type of study, with much greater emphasis on interpreting the results of the natural sciences. Furthermore, since the issues in the debate are highly controversial, I do not expect readers to agree with me on every point. I will feel that I have succeeded if readers from several different perspectives can feel that I have at least identified the core issues of the debate and mapped out its cognitive landscape in an insightful manner.

Structure of this Study

This study has ten chapters. The first chapter introduces the controversy over Intelligent Design and my methodology. It is followed by a background chapter introducing some closely related views, such as creationism, theistic evolutionism and naturalistic evolutionism. The relationship of theology and the natural sciences is a complex and controversial issue, which will keep coming up throughout this study. Because of this, the chapter introduces many basic concepts used in the theology and science -discussion, and shows how my own approach to the study of the Intelligent Design debate builds on these.

Chapters three and four analyse the basic ideas and logic of design arguments, as well as setting the stage for further analysis. Chapters five and six analyse the empirical debate about the design argument, which I divide broadly into cosmic and the biological design arguments. Chapter seven explores the philosophical and theological questions raised by the previous chapters further, with particular focus on analysing critiques of "designer of the gaps" and "naturalism of the gaps" -arguments. Chapter eight focuses further on the tensions between ID and theistic evolutionism. Chapter nine analyses the discussion surrounding the problem of natural evil and design arguments. I then summarize the results of my research and the answers to my research questions in chapter ten.

Taken together, these chapters cover a broad amount of ground. An alternative approach would have been to just focus on the theme of one chapter, such as the philosophical basis of the fine-tuning argument (chapter 5) or the problem of natural evil (chapter 9). However, my purpose is not to provide the deepest analysis of fine-tuning or the problem of natural evil to date, but rather to provide an analysis of the Intelligent Design movement's particular design arguments and the structure of thought which underlies them. For this purpose, it is necessary to examine this design argument from a variety of angles. This makes it possible to see new connections and tensions that have not been clear in previous research. Furthermore, since the issues are linked, advancing the discussion requires understanding all of the central issues surrounding design arguments.

The breadth of this study is also necessary to demonstrate how philosophical and theological ideas influence the discussion on ID, and what their role is in relation to the

empirical arguments. Based on my analysis of the arguments used in the discussion, I have reached the overarching conclusion that there is no philosophical or theological “silver bullet” that could by itself settle the discussion either for or against ID’s design arguments³ Though philosophical and theological reasons can and do influence our beliefs regarding the history of life, evolution and design, such considerations cannot allow us to wholly bypass discussion of the empirical evidence. Opinions about the designedness (and undesignedness) of the cosmos are in practice formed in a complex interplay of many influences, including empirical, philosophical, theological and psychological factors, among others.⁴

1.2. Introducing the Controversy over Intelligent Design

What is the Intelligent Design Movement?

Several different narratives of the history of Intelligent Design have been proposed. Many have connected Intelligent Design with the creationist movement of the 20th century, noting similarities between the arguments used against Darwinian evolutionary biology.⁵ The ID movement’s rise to publicity happened after the 1987 Arkansas trial on the teaching of Scientific Creationism in public schools in the U.S.A. However, the movement’s proponents themselves see deeper roots for their ideas in the tradition of design arguments stretching back to ancient Greek philosophy. There is a good deal of justification for this, although the Greek arguments also differ substantially from ID.⁶ The first versions of the contemporary ID movement’s arguments appeared already before the Arkansas Creationism trials, in the 1984 book *The Mystery of Life’s Origin* by Charles Thaxton, Walter Bradley and Roger Olsen. But the formation of an actual movement of thinkers called the Intelligent Design movement is connected to the Berkeley law professor Phillip E. Johnson and his criticisms of naturalism

³ This is comparable to what Gregory Dawes (2009) has argued for theistic explanations and what Robert Larmer (2014) has argued in respect to miracles. Del Ratzsch (2001), Jeffrey Koperski (2008) and Bradley Monton (2009) have argued similarly in the discussion on ID.

To clarify, I do not mean that I think anyone in the debate on design and evolution really wants to wholly bypass the discussion of the empirical evidence. However, both naturalistic and theistic philosophical and theological arguments are in practice often referred to in the debate as though they could be used to rule out a particular view of the history of life (such as ID or theistic evolutionism) even apart from the consideration of the empirical evidence. In contrast, it seems to me that a theology of creation can in principle be constructed to fit either ID or theistic evolutionism, depending on where the evidence seems to lead. Similarly, Robin Collins (2009, 243) argues that there is no a priori reason whereby we could have predicted that God must choose Darwinian evolution as his way of creation. So, Collins’ belief in evolution is based on the scientific evidence, and the theological interpretation of evolution comes after this. These issues will become clearer in the coming chapters as I delve deeper into the arguments.

⁴ Social and political factors also enter into the equation, but these are not in the focus of my dissertation. I come closest to an analysis of psychological factors in chapter 4.1 and political factors in chapter 2.2.

⁵ E.g. Forrest & Gross 2004, Shanks 2003; see also Woodward 2003 and Woodward 2006 for the ID movement’s perspective.

⁶ Sedley 2007.

and Darwinism in the 1990's. Johnson was soon joined by philosopher Stephen Meyer, mathematician-philosopher-theologian William Dembski, and biochemist Michael Behe, among others. The movement also gained some support from influential Christian philosophers like Alvin Plantinga, J.P. Moreland and William Lane Craig.⁷

Though different narratives about the origins and nature of the Intelligent Design movement abound, both critics and defenders agree that the *Center for Science and Culture* (CSC) of the Seattle-based "think tank" *Discovery Institute* is the most important gathering point for the ID theorists. CSC provides the following definition for Intelligent Design:

Intelligent design refers to a scientific research programme as well as a community of scientists, philosophers and other scholars who seek evidence of design in nature. The theory of intelligent design holds that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection. Through the study and analysis of a system's components, a design theorist is able to determine whether various natural structures are the product of chance, natural law, intelligent design, or some combination thereof. Such research is conducted by observing the types of information produced when intelligent agents act. Scientists then seek to find objects which have those same types of informational properties which we commonly know come from intelligence. Intelligent design has applied these scientific methods to detect design in irreducibly complex biological structures, the complex and specified information content in DNA, the life-sustaining physical architecture of the universe, and the geologically rapid origin of biological diversity in the fossil record during the Cambrian explosion approximately 530 million years ago.⁸

The Discovery Institute's definition emphasises the Intelligent Design movement's claimed intellectual and scientific nature. According to this definition, Intelligent Design is three things: (1) a scientific research programme attempting to find evidence of design in nature,

⁷ For different perspectives on the history of Intelligent Design, see Giberson & Yerxa 2002, Woodward 2003 & 2006, as well as Forrest & Gross 2004. On the support for ID from Christian philosophers, see Plantinga 1991, Moreland (ed) 1994 and Craig 2007.

⁸ Discovery Institute 2011. Campbell (2004, 33) provides a similar definition. Bradley Monton (2009, 15-29) has provided a critique of the first part of this definition: "*certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection.*" Monton argues that the definition is problematic, because: (1) Everyone believes that at least some features of the universe and living things are designed, and thus the definition is not specific enough. For example, human artifacts are also a part of the universe, and are designed. (2) Typically ID proponents mean to refer to the detection of non-human intelligent causes, though this is not mentioned in the definition. Thus seeing an automobile as designed does not suffice to make one a member of the ID movement. (3) ID proponents typically believe that the intelligence thus discovered is not itself produced by natural processes. The definition I have quoted avoids the first two dangers by referencing more specific places where the ID movement claims to detect design, such as "irreducibly complex biological structures" and "the life-sustaining physical architecture of the universe." It is clear that not just any believer in human design also sees design in these places. The question of whether ID's designer is necessarily supernatural will be discussed in chapter three. In any case, Monton's remarks make it clear that this is not an exhaustive definition of ID.

(2) a community (or movement) of scholars who participate in this research programme⁹, and (3) a theory which holds that there is indeed evidence for intelligent design in nature. This theory is said to be based on the study and analysis of natural systems. Advocates of Intelligent Design emphasize that their design argument rests on new scientific discoveries which provide evidence for design and against Darwinism. They point to developments in (for example) physics, cosmology, molecular biology, genetics, information theory, mathematics and the philosophy of mind as providing the basis for their design argument.

The definition's distinction between the idea of evidence for design and the community known as the Intelligent Design movement is useful. The idea that there is evidence for the operation of an intelligent mind in nature is far older and more popular than the ID movement itself. It is more popularly known as *the design argument* or the *teleological argument*, and it has been formulated in many ways over the centuries. According to philosopher Del Ratzsch's definition, "*teleological arguments focus upon finding and identifying various traces of the operation of a mind in nature's temporal and physical structures, behaviors and paths.*"¹⁰ As a community, the main thinkers of the ID movement are mostly located in the United States of America, but the movement does also have global influence.¹¹

The design argument of the ID movement is controversial partly because the ID theorists generally believe that a critique of Darwinism is essential for the defence of the design argument. According to ID supporter Thomas Woodward's analysis, the movement's story is about "*respected professors at prestigious secular universities – rising up and arguing that (1) Darwinism is woefully lacking factual support and is rather based on philosophical assumptions, and (2) empirical evidence, especially in molecular biology, now points compellingly to some sort of creative intelligence behind life.*"¹² Woodward emphasises the intellectual nature of the ID movement, just as the previously quoted Discovery Institute's definition also does. The ID movement sees its critique of Darwinism as a scientific dissent from a doctrine of evolution which does not fit the facts. Dissent from this doctrine is seen as the courageous and intellectually honest thing to do.¹³ The movement's critique of Darwinism sets its design argument apart from views which seek to harmonize evolutionary biology and belief in creation and/or design.

In addition to its defence of the design argument, Intelligent Design's critique of methodological naturalism is also a distinctive mark of the movement's argumentation.¹⁴

⁹ The terminology of the first two definitions comes from the philosopher of science Imre Lakatos' (1977) analysis of scientific research programs. For a classic analysis of Lakatos in the theology and science discussion, see Murphy 1993.

¹⁰ Ratzsch 2010.

¹¹ The works of Cardinal Christoph Schönborn (2007) and Matti Leisola (2013) are just a few examples of support for ID in Europe. Many others could also be cited; see Numbers 2006, chapter 18 for further discussion. My dissertation focuses on the work of ID's main theorists, who are all U.S. citizens.

¹² Woodward 2003, 195.

¹³ For examples of this understanding in the own words of the ID movement's thinkers, see Dembski's collections *Uncommon Dissent: Intellectuals Who Dissent From Darwinism* (2004), and *Darwin's Nemesis: Phillip Johnson and the Intelligent Design movement*. (2006)

¹⁴ As noted by Beckwith (2003).

Methodological naturalism is understood in the movement as the idea that only “natural”, mechanistic and non-purposeful explanations are allowed in the natural sciences. ID’s critique of methodological naturalism stems partly from a desire to challenge materialistic interpretations of natural science, and build a new kind of natural science more consonant with theology. So, the definition of science is thought to have not only scientific, but also cultural importance. The issue is also important to critics of ID. Theistic evolutionists typically argue that methodological naturalism does not imply that we cannot rationally discuss theological questions (such as the purposiveness of nature) outside of natural science. The issue is politically charged, since the status of ID as science or non-science will determine whether it can be taught in public schools U.S. Consequently, much has been written on whether ID is natural science or not.¹⁵ In this study, I will consider this question of definitions primarily as it related to ID’s primary idea: the design argument.

The Importance of Theological and Philosophical Analysis of ID

The Discovery Institute’s definition quoted above places an emphasis on the scientific nature of Intelligent Design. While the empirical arguments of ID will not be ignored in this study, my focus is on the philosophical and theological side of Intelligent Design. I believe that this approach is important for six reasons.

First (1), as will become apparent in the coming chapters, the discussion on ID often impinges on fundamental theological and philosophical questions regarding the relationship of science and religion, the ultimate character of reality and how beliefs are justified.

Second (2), there are many interesting philosophical issues to analyse in design arguments, and the argument’s logical structure needs to be clarified. The evaluation of the current state of natural science is not necessary for this kind of philosophical work.

Third (3), philosophical and theological differences strongly influence the different views about the rationality of design arguments, and not acknowledging their important role on all sides would lead to a misleading representation of the debate.

Fourth (4), the design argument is traditionally part of the theological and philosophical programme of natural theology, and situating ID’s design argument in this discussion is necessary for understanding its strengths and weaknesses when compared to other approaches.

Fifth (5), because I am a theologian and this is a study done at a theological faculty, it is better to concentrate on the aspects where my competence is strongest, rather than attempting an analysis of Intelligent Design in the light of the natural sciences.

Sixth (6), the theological and philosophical side of Intelligent Design is also very important for the movement itself, even though this side of the movement is not mentioned in the CSC’s definition. It is possible that the omission is made for the strategic reason that

¹⁵ E.g. Ruse 1996, Ratzsch 2001. For further discussion, see chapters 3.5. and 3.6.

emphasizing the theological side of ID's project could make it more difficult to get a hearing for ID's empirical arguments in the secular media and public schools.

Other definitions of Intelligent Design by members of the ID movement reveal the importance of theology clearly. In ID theorist William Dembski's definition, *"Intelligent Design is three things: a scientific research programme that investigates the effects of intelligent causes; an intellectual movement that challenges Darwinism and its naturalistic legacy; and a way of understanding divine action."*¹⁶ Here "a way of understanding divine action" reveals the importance of the theological side of ID. Thomas Woodward similarly emphasizes the scientific motivations of Intelligent Design, but admits that its goal is also to open up both science and society for the *"serious consideration of the theistic perspective."*¹⁷ Angus Menuge likewise argues that *"defenders of ID see themselves as revolutionaries who can build bridges between science and theology."*¹⁸

Though ID theorists emphasize the scientific side of their motivations, many critics of the movement think the religious side is more important. For example, Barbara Forrest writes that *"in actuality, this 'scientific' movement which seeks to permeate the American academic and cultural mainstream is religious to its core."*¹⁹ For Forrest, Intelligent Design is not a scientific research programme (because it does not fulfil the criteria required of such programmes) but a religious movement that is trying gain power in American cultural and academic life. In her opinion, ID's so-called scientific arguments are just a smokescreen. Their arguments are not of any value scientifically, but represent reiterations of creationist arguments long since discredited by mainstream scientists.²⁰ Robert Pennock also argues that *"the creation/evolution debate is only superficially about science. At its base, it is about religion and it is about philosophy."*²¹ I would not go quite as far as this – I think that there are real disagreements about the state of natural science in the debate, and the empirical evidence is important for all sides of the debate. The empirical side of the discussion includes things like debates about the viability of various hypotheses of the origin of life, the possibility of evolving "irreducibly complex" biochemical structures, what kind of values the constants of nature need in order to make life possible, is biological order machine-like and so on. Having read material from ID proponents and based on my interaction with some of the members of the movement, it is my feeling that they honestly believe in the strenght of their empirical arguments. However, Pennock is right that the debate is definitely also about religion and philosophy.

Many secular critics of ID feel that ID's religious overtones are dangerous, and believe that stopping ID is important for the preservation of Enlightenment values and a free secular society. They worry that ID's bid to include intelligent design as a possible explanation

¹⁶ Dembski 1999, 13.

¹⁷ Woodward 2003, 205.

¹⁸ Menuge 2004a, 48-49.

¹⁹ Forrest 2001, 30.

²⁰ Forrest 2001, 31-32. More on the definition of creationism below.

²¹ Pennock 2009, 309.

within the natural sciences would lead to the cessation of natural science in favour of vacuous “God did it” -explanations when encountering mysterious phenomena.²² These secular critics of ID argue that the fact of evolution is so clearly established by the scientific evidence that any contrary opinions must be explained by non-rational factors such as a fear of the religious and moral implications of evolutionary theory.²³

So, it is clear that the debate on ID has its political side. While the Discovery Institute’s *Center for Science and Culture* has focused much of its funding on ID research, it has also argued for the permissibility of criticizing Darwinism and defending the freedom of teachers to teach ID’s arguments as part of public science education in the United States.²⁴ Forrest’s most important evidence is the Discovery Institute’s *Wedge document*: a plan sent to supporters which laid out a long-term plan for using Intelligent Design as a means of affecting culture and opening up discussion on moral and religious values. The document was subsequently leaked and later also made available to the public by the Discovery Institute. In the document, ID’s scientific programme serves the cultural goal of preserving the cultural authority of Judeo-Christian values such as the value of human life.²⁵ While Forrest presents the *Wedge document* with the air of investigators uncovering a secret conspiracy, Menuge correctly points out that these cultural aims were already openly proclaimed by ID supporters such as Johnson long before the publication of the *Wedge document*.²⁶

These examples highlight the importance of the religious side of ID, and thus also the importance of its philosophical and theological study. They also reveal the contentious nature of the debate. Theological and philosophical analysis can bring light to openly revealed and hidden presumptions on both sides of the debate. The need for clarity and a

²² See e.g. Forrest & Gross 2004, Shanks 2004, 244, who believe that ID is ultimately attempting to replace secular democracy with a theocracy. The basis for this claim is that the Discovery Institute has received an important part of its funding from Howard Ahmanson, who Forrest identifies as a follower of the Christian reconstructionism of R. J. Rushdoony (1973) and Dominion theology. Ahmanson also has a place on the Discovery Institute’s board of directors. However, as Numbers (2006, 382) has noted, the Discovery Institute has never advocated theocracy. The Discovery Institute’s argues that in practice its fellows have defended democracy, human rights and the American separation of church and state on many forums. (Discovery Institute 2005). Gregory Dawes (2007) provides many more examples of polemical characterizations of ID.

²³ Freeman & Herron (2007, 105) also argue against ID in this way in their textbook of evolutionary biology.

²⁴ Forrest & Gross (2004) chronicle many battles over science education. Here too the truth about Intelligent Design is contentious. The Discovery Institute argues that it has merely tried to defend the academic freedom of teachers to question Darwinism, and has not attempted to force anyone to teach Intelligent Design through politics (DeWolf, West, Luskin & Witt 2006).

One battle over school education which received much publicity occurred in Dover, Pennsylvania in 2005. ID was not taught in the classroom, but the school district decided that a short statement about the “gaps” of Darwinian evolutionary theory and the existence of ID was read prior to biology lessons. The matter eventually became a court case, which even included an investigation of whether Intelligent Design qualifies as science. The judge accepted the arguments against ID and ruled against the school district. (Jones 2005, for critique see DeWolf, West, Luskin & Witt 2006)

²⁵ The Discovery Institute 2003, Johnson 2000. For critiques of the “wedge”, see Shanks (2004, 244) and Forrest & Gross (2004, chapter 2).

²⁶ Menuge 2004, 36.

balanced analysis has been stressed (for example) by philosophers Jeffrey Koperski and Del Ratzsch, who have called on scholars to analyse ID calmly to identify both the strengths and weaknesses of ID thought.²⁷ In Finnish systematic theology, the method of systematic analysis is typically used precisely to better understand a system of thought, rather than to criticize it. So the method chosen for this study is suited for producing the sort of balanced analysis Koperski and Ratzsch call for. Of course, understanding a system of thought can also help one see its flaws more clearly. However, my personal hope is that this analysis will not just result in pointing out flaws in the various viewpoints, but also build bridges between them to help the continuation of the dialogue.

The contentiousness of the discussion is also revealed in the varied nature of the criticisms directed against Intelligent Design. For example, the ID movement's design argument has been criticized both by arguing that the hypothesis of a designer is unfalsifiable and by arguing that ID's design argument has been falsified.²⁸ In theological critiques of ID, ID's susceptibility to falsification by future scientific discoveries is often seen as one of its greatest flaws.²⁹ Some critics of Intelligent Design argue that design is excluded from science on philosophical grounds³⁰, while others argue that naturalistic science is open even to supernatural explanations if there is evidence.³¹ Some argue against Intelligent Design from atheist premises, regarding the design argument as the best sort of evidence for God.³² Others argue against Intelligent Design from theistic premises, believing Intelligent Design to be a theologically mistaken "God of the gaps" -doctrine.³³ Some of ID's critics reject the possibility of all design arguments,³⁴ while others defend broader cosmic design arguments themselves.³⁵ Some critics even agree with the ID theorists that there are major problems in mainstream Darwinian evolutionary theory, but do not agree that intelligent design is any better as an explanation for life's development.³⁶ Intelligent Design is a controversial minority position, and the majority of the scientific community has rejected it. However, the literature responding to ID is far from unanimous. The reasons for the rejection of the ID movement's ideas vary, and many critics agree with ID on at least some point. The philosophical and theological issues of the Intelligent Design discussion have thus not been

²⁷ Koperski 2008, Ratzsch 2001.

²⁸ For example, see the collection edited by Pennock 2001 and Del Ratzsch's review (2001).

²⁹ See chapter 7.2. of this study.

³⁰ Pennock 1999.

³¹ Young & Edis 2006, Kitcher 2007.

³² Dawkins 2006a.

³³ Haught 2003, Cunningham 2010.

³⁴ Dawkins 2006a, Pennock 1999.

³⁵ Miller 2002, Swinburne 2004c.

³⁶ For example, Lynn Margulis, known for her endosymbiosis theory, agrees with Michael Behe's critique of the Darwinian mechanism of natural selection and mutation, but disputes ID theory as an alternative. For Margulis' views on evolution see Margulis 1999, for her views on the ID movement see her interview in *Discover Magazine* (Teresi 2011.) See also Fodor & Piattello-Palmarini 2009, for their view that the mechanism of natural selection lacks creative power, and Cobb 2008 as well as Pigliucci & Müller 2010 for the complexity and richness of modern evolutionary theory.

settled. Because of the variety of viewpoints and the extent of the disagreement on central philosophical issues, there is room for a balanced theological and philosophical analysis of the movement's ideas.

1.3. Sources and Literature

The Intelligent Design Theorists

The primary source material of this study consists of the central Intelligent Design theorists' writings and collections where they engage their naturalistic and theistic critics. The most central thinkers of the Intelligent Design movement, according to both defenders and critics of the movement, are Phillip Johnson, Michael Behe, William Dembski and Stephen Meyer.³⁷ Their works constitute the main sources of this study. Works by other ID theorists are also used to fill in gaps and to help identify central arguments. I will now briefly describe these thinkers and some of my source material.

Phillip Johnson, professor emeritus of law at the University of Berkeley, California, is universally acknowledged to be the movement's most important early leader and the one most responsible for creating the movement's vision in the 1990's. This study uses Johnson's books *Darwin on Trial* (1991), *Reason in the Balance* (1995), *Defeating Darwinism by Opening Minds* (1997), and *The Wedge of Truth* (1999), as well as several articles. However, many of Johnson's ideas have been defended in more depth and substantially altered by the other thinkers of the ID movement, and thus Johnson is not often in the spotlight in this study.

Michael Behe, professor of biochemistry at Lehigh University in Bethlehem, Pennsylvania, is responsible for the movement's most popular anti-Darwinian argument, the argument from irreducible complexity. Behe's main importance for the movement comes from his scientific arguments, but he has also written on the philosophy of the design argument, and has commented on its religious implications. This study utilises Behe's works

³⁷ Dawes (2007, 70) similarly considers Behe, Dembski and Meyer to be the central ID theorists. Meyer has become even more important since Dawes' article, because of the publication of Meyer 2009 and Meyer 2013. Jonathan Wells and Paul Nelson are also important figures for the ID movement, and were present in the Pajaro Dunes meeting which the ID movement considers pivotal. (Illustra Media 2003) Robert Pennock (1991) thus characterizes Nelson as one of the "four horsemen" of ID together with Johnson, Behe, and Dembski. The Discovery Institute's *Wedge Document* (2003) likewise highlights Nelson's research as important for ID. However, Nelson's and Wells' publications have not been as central or as referenced as those of Johnson, Behe, Dembski and Meyer. Nelson's monograph *On Common Descent*, already promised in the *Wedge Document*, is still under work and cannot be used as a source. In any case, Wells and Nelson focus on critiquing the arguments for common descent, and this debate will not be in the focus of this study, since it is not essential to ID's design arguments. (I will demonstrate this in chapter 6.)

In recent years, Casey Luskin has been one of the most important popularizers of ID through the Discovery Institute blog *Evolution News and Views*. However, his arguments are dependent on the work done by the main ID theorists, so he himself will not be in the focus of this study.

Darwin's Black Box (1996) and *The Edge of Evolution* (2007), as well as many articles and Behe's dialogues with his critics on the Internet.

William A. Dembski is a mathematician and theologian. Dembski is currently affiliated with the Discovery Institute, but has previously been employed at Baylor University (where he briefly led his own controversial centre of research) and Southern Baptist Theological Seminary (Forth Worth, Texas). He is known for his development of the concept of specified complexity and his eliminative design inference as well as his many books integrating ID with Christian theology. Dembski is a prolific and influential writer. This study references his works *The Design Inference* (1998), *Intelligent Design: The Bridge Between Science and Theology* (1999), *No Free Lunch* (2002), *The Design Revolution* (2004), *The End of Christianity* (2009), as well as many articles and co-authored or edited books, such as *The Design of Life* (2007, together with Jonathan Wells) and *How to be an Intellectually Fulfilled Atheist (Or Not)* (2008, together with Jonathan Wells).

Stephen C. Meyer is a philosopher of science and the director of the Discovery Institute's *Center for Science and Culture* in Seattle. Meyer's recent works *Signature in the Cell* (2009) and *Darwin's Doubt* (2013) have substantially expanded and elaborated the ID movement's defence of design arguments. However, Meyer has been important for ID's development from the beginning behind the scenes, and I also reference many of his articles that predate the books. Meyer is also the author of the ID textbook *Explore Evolution: The Arguments for and Against Neo-Darwinism* (2007) together with Scott Minnich, Jonathan Moneymaker, Paul A. Nelson, and Ralph Seelke.

Other Sources and Literature

The Intelligent Design movement includes a great variety of thinkers and design arguments. This study does not analyse all of the arguments used in the sources, as that would require far too much space. Instead, this study includes analysis only of those arguments that have emerged as central for the design argument of the ID movement. The breadth of sources is used to analyse ID's arguments on these crucial points as well as possible. I have identified the centrality of the analysed arguments by their repetition among the main ID theorists and the rest of the ID literature, as well as their centrality in the structure of Intelligent Design theory as shown by systematic analysis. This sort of analysis is possible, because the ID theorists' design arguments and theological views as they relate to the design argument are very similar despite their varied denominational backgrounds.

As sources on the critique of Intelligent Design from the standpoint of naturalism and theistic evolutionism, I have utilized numerous books and articles defending these points of view. There is a great amount of such articles, so I have selected to focus mainly on thinkers who interact with the Intelligent Design movement. I also reference scientific, philosophical and theological literature on the each topic analysed.

This study is focused on Intelligent Design, and is not a study of naturalism or theistic evolutionism as such. I have two main reasons for nevertheless including these points of comparison. First, as already mentioned, the Intelligent Design movement's argumentation

is controversial. An analysis of the movement's argumentation can only be convincing as it takes into account the existence of alternative interpretations. Second, the ID theorists themselves argue their views largely in relation to these alternative views. To understand Intelligent Design, one must thus also understand their views about naturalism and theistic evolutionism.³⁸ I will now proceed to introduce the players in the debate in more detail.

³⁸ This is also one reason why I do not consider other alternatives to Intelligent Design such as Young-Earth creationism in more detail. The interaction of the ID theorists with the Young-Earth view is simply very limited. I feel my analysis in chapter 2.1. is sufficient for clarifying the relationship of ID and creationism. Pantheistic and panentheistic views, panpsychism and polytheistic views of evolution are also largely bypassed because of this reason.

2. BACKGROUND

2.1. Creationism and Theistic Evolutionism

Controversy over the Background of Intelligent Design

Even the history of Intelligent Design is contentious, and narratives of it can be part of the political struggle for or against the movement.³⁹ Nathaniel C. Comfort correctly notes that “one point on which anti-Darwinists and anticreationists agree is that this is a pitched battle between dogmatic religious fanatics on the one hand, and rigorous, fair-minded scientists on the other. However, which side is which depends on who you read.”⁴⁰ In critiques of Intelligent Design, it is often considered a repackaged version of creationism. It is argued that after the U.S. Supreme Court’s 1987 decision to outlaw the teaching of “scientific creationism”, some creationists sought to avoid the legal implications by adopting a new name, “Intelligent Design”, for their position.⁴¹ The ID theorists have tried to present a more complex picture of the movements’ origins, and have emphasized the differences between Intelligent Design and the creationism whose teaching was outlawed in 1987. They also note that the movement includes thinkers from non-creationist backgrounds as well.⁴²

The relationship of ID and creationism is indeed more complex than the simple caricatures allow. While some early ID works use the term creationism, they use it in a far more general sense than the “scientific creationism” which was the subject of the 1987 trial.⁴³ Furthermore, the influential ID-books *Mystery of the Origin of Life* (1984)⁴⁴ and *Evolution: A Theory in Crisis* (1986)⁴⁵ had already been published before the 1987 trial. Karl Giberson and Donald Yerxa link ID with creationism in a more plausible, neutral way: the early ID theorists in the 1980’s were dissatisfied with creationism already before the 1987 trial, and sought a way to break out of creationism’s intellectual ghetto.⁴⁶ It seems credible to argue

³⁹ For different narratives, see Woodward 2003 and Forrest & Gross 2004. For attempts at a neutral view, see Giberson & Yerxa 2002 as well as Numbers 2006.

⁴⁰ Comfort 2007, 3.

⁴¹ Forrest & Gross 2004.

⁴² E.g. Behe 2000a, Dembski 1999a. In addition, ID theorists refer to earlier secular uses by the term “intelligent design”, such as by Fred Hoyle (Witt 2007), on the development of ID Dembski 1998; Witt 2005; Woodward 2003, 33-45. Both ID and creationism also draw strength from debates within the community of evolutionary biologists. For example, Phillip Johnson (1993, 154) references the debate between punctuated equilibrium and gradualism to argue against the existence of good fossil evidence in support of common descent. This was rhetorically effective, though both sides of the debate believed in the existence of fossils demonstrating evolutionary transitions. (Similarly Denton 1987, chapter 7. Note also that Denton affirms belief in common descent in his later works, e.g. Denton 1998). See further Woodward 2003, chapter 2.

⁴³ E.g. Johnson 1993; Dembski 1999a, 247-251. The same seems to be true of the textbook evidence analysed by Forrest & Gross (2004).

⁴⁴ Thaxton, Bradley & Olsen 1992.

⁴⁵ Denton 1986.

⁴⁶ Giberson & Yerxa 2002.

that the movement indeed gained more influence after the 1987 creationism trial gave additional reason for creationists to move away from the old approaches, but ID's basic idea of presenting better and more minimalistic arguments in favour of belief in biological design was already present before the trial.⁴⁷

Giberson and Yerxa are correct to note the influence of creationists in the ID movement, but it is also true that not all major ID theorists have such a background. Michael Behe moved to Intelligent Design from a theistic evolutionistic viewpoint rather than any variety of literalistic creationism. Some agnostics, such as Michael Denton and David Berlinski, have also been influential in the movement.⁴⁸ The account of Forrest and Gross gives too little attention to these thinkers, but their inclusion in the analysis does complexify the picture of the ID movement.⁴⁹ However, it is correct that ID has much support in the same social circles that also support the "scientific creationism" which was on trial in 1987. There is a difference here between the movement's intellectual leaders and its lay supports.⁵⁰

Broad Definitions of Creationism

History alone does not settle the question of the relationship of ID and creationism. Rather, the answer also depends on the definition of creationism. Broadly understood, creationism refers simply to the belief that some sort of creative intelligence was involved in the creation of the cosmos and life. For example, Niall Shanks argues that the design argument forms the core of creationism. On this broad definition, Intelligent Design can clearly be classified as creationism. However, this definition also includes many theistic critics of ID (such as the Darwinian biologist Kenneth Miller) among the creationists. Consistent with his definition, Shanks does indeed call Miller a "cosmological creationist".⁵¹ David Sedley similarly classifies the thought of Socrates and Plato as creationism in his important work *Creationism and its Critics in Antiquity* (2007). Sedley defines creationism as "the thesis that the world's structure can be adequately explained only by postulating at least one intelligent designer, a creator god."⁵² For Sedley, this is also the central issue that "separates modern 'creationists' from their Darwinian critics."⁵³ Again, theistic evolutionists are also creationists under this definition.

According to Robert Newman, creationism means simply belief in the doctrine of creation, according to which the world and everything in it has gotten its being from God. Newman divides possible alternatives to creationism into four options: (1) atheism, which asserts that the world exists without gods, (2) pantheism, which asserts that the world is

⁴⁷ Ratzsch (1996, 84-85) similarly identifies early ID theorists as "upper tier" creationists trying to create more informed and scientific arguments for the creationist belief in the designedness of the order of nature.

⁴⁸ Berlinski 2009.

⁴⁹ Woodward 2003.

⁵⁰ This is evidenced by the school education battles chronicled by Forrest & Gross (2004).

⁵¹ Shanks 2004, 6. For Shanks' definition of Kenneth Miller as a "cosmological creationist", see Shanks 2004, 234.

⁵² Sedley 2007, xvii.

⁵³ Sedley 2007, xvii.

God, (3) pantheism which asserts that the world is God's body, and (4) dualism, which says that matter is self-existent, but God has molded it.⁵⁴ While most ID theorists are creationists according to this definition, they would emphasize that their theory of design is at least theoretically also compatible with Newman's other options: atheism, pantheism, panentheism and dualism. This is because their design argument does not yet identify the designer, so someone could in principle interpret the designer as an extraterrestrial alien or Plato's demiurge, for example. On this definition, Intelligent Design is not identical to creationism. Rather, it is a much more minimalistic argument that does not alone determine the broader worldview of the proponent.⁵⁵

Varieties of Creationism

The definition of creationism can be further defined by specifying what is meant by creation. Does creation refer to God's maintaining the world in existence at every moment, the giving of existence sometime in the past, or both? Is there a notion of *creatio continua*, as well as *creatio ex nihilo*?⁵⁶ In the contemporary discussion, varieties of creationism emerge particularly in relation to scientific investigations of origins. Three typical forms of creationism (as broadly understood) are literalistic (Young-Earth) creationism, progressive (Old-Earth) creationism and theistic evolutionism. Many ID theorists use the term "creationism" to refer only to literalistic creationism, and have labored to distance ID from creationism as thus understood. For them, Intelligent Design refers only to the belief that the actions of an intelligent designer can in some way be recognized in the pattern of nature, while creationism makes much more specific claims.⁵⁷ Under the above broad definition, theistic evolutionism is also a form of creationism. However, theistic evolution is also often separated from creationism, because creationism is understood to imply an opposition to mainstream evolutionary theory. Ratzsch argues that in creationism, it is believed that "*whether or not God could have built evolutionary potentials into the creation, or could have brought about life and all its diversity by evolutionary means, he did not in fact do so. There are thus discontinuities in nature – e.g., non-life/life, reptile/mammal, animal/human – which cannot be crossed by purely natural means, each such discontinuity requiring separate supernatural creative action.*"⁵⁸ The use of the word "creationism" therefore varies greatly and we must take care to define what we mean by the term.⁵⁹

⁵⁴ Newman 2001, 115.

⁵⁵ On the separation between the designer and God, see e.g. Behe 2001a, 699-700; 2007, 277-288; Dembski 2002b, 195.

⁵⁶ Peters & Hewlett 2006.

⁵⁷ According to Koperski (2003, 568), the use of the term "creationist" has indeed become pejorative in the criticisms of Intelligent Design such as those presented by Pennock (1999).

⁵⁸ Ratzsch 1996, 12.

⁵⁹ Because of the many uses of the word, the use of the term "creationism" in early Intelligent Design literature as demonstrated by Forrest & Gross (2004, 273-283) and Bell (2010) does not seem sufficient to demonstrate that the

Literalistic creationism is the view that the Earth and all species of animals were miraculously created only six to ten thousand years old. This view is based on a literal, historical interpretation of the biblical scriptures, which are understood as God's word about history, and an interpretation of the scientific evidence which seeks to harmonize science with this literalistic view. Thus science is argued to support belief in a young Earth, the reality of a global flood in Noah's time, the possibility of starlight to travel to the Earth from distant stars during the creation week, and so on. These theories require extensive modifications of mainstream scientific physics, astronomy, geology, biology and history. These ideas have not gained much ground in the scientific community, since the creationists' view about the literal understanding of the Bible as the guiding framework of the natural sciences is not widely shared.⁶⁰

The Intelligent Design movement has some literalistic creationists, and the arguments of literalistic creationists have been important influences for many others within the ID camp. For example, the biologist Paul Nelson is a literalistic Young Earth -creationist. Nelson reports that creationists of his sort are a minority among the movement's leading theorists.⁶¹ Dembski and Denton have reported that their scepticism of evolution was influenced by the arguments of literalistic creationists, though Dembski and Denton themselves accept mainstream estimates for the age of the cosmos and life on Earth.⁶² There are indeed substantial similarities in the way these creationists and the ID movement criticize Darwinism both scientifically and morally.⁶³ However, while the ID theorists generally avoid bringing the Bible into the discussion on origins, and regard evidence of design as the central point, many in the camp of the literalistic creationism consider the authority of biblical scripture to be the central issue.⁶⁴

Progressive creationism (or *Old Earth -creationism*) accepts the old history of the Earth and the universe. The "days" of the Genesis account of creation in ways which accommodates the long ages of natural history, and God's creating work is believed to have occurred progressively over this time through numerous supernatural creative acts. Views on where such acts were required vary. Some progressive creationists believe that God acted to create the major kinds of animals, while others believe God intervened only in the origins of life and the origin of the human soul, for example. Progressive creationists can criticise the

ideas of the movement are not different from those of some variety of creationism. Rather, there is both substantial continuity and substantial discontinuity between ID and many varieties of creationism.

⁶⁰ Numbers 2006 is the most comprehensive discussion of creationism and its problems available. For a good balanced discussion of the controversy on creationism, see also Ratzsch 1996.

⁶¹ Nelson 2002. The Finnish biotechnologist Matti Leisola, who is the editor of the ID journal *Bio-Complexity*, is another influential ID proponent who is skeptical of the old age of the Earth. (Leisola 2013, chapter 8.1.)

⁶² Dembski 2005c, Denton 2004.

⁶³ Forrest & Gross 2004. For ID's moral critique of Darwinism, see Wiker 2002 & West 2007 and chapter 8.2. of the present study.

⁶⁴ Ronald Numbers' (2006) authoritative study on creationists thus only includes a few mentions of the design argument outside the Intelligent Design movement, concentrating more on the creationists' Flood Geology, which is absent in ID. Young Earth -creationists have also criticised the ID movement for concentrating on design arguments rather than defending the authority of biblical scripture on the matters of origins (e.g. Wieland 2002).

sufficiency of the Darwinian account of origins like literalistic creationists. ID theorist Phillip Johnson can be classified as a progressive creationist, as can many others in the movement.⁶⁵

Theistic Evolutionism

Theistic evolutionism or *evolutionary creationism* means the belief that God has used an evolutionary natural process to create the living species. Mainline Catholic and Protestant theology accepts the compatibility of evolutionary theory and the doctrine of creation. Theistic evolutionists want to take mainstream science seriously when considering how we should understand the doctrine of creation.⁶⁶ Under the broad definitions of creationism, theistic evolutionism is also creationism since it includes belief in a Creator. However, if we adopt a narrower definition where creationism requires belief in the miraculous activity of God within natural history and critique of evolutionary theory, then most varieties of theistic evolutionism are not creationism.

Ian Barbour classifies theistic evolutionism broadly into three forms. On the first view (1), *God controls events that appear to be random*. On this view, the process of evolution is understood to be under God's control, though his supervision is not included in scientific theories of our origins. On the second view (2), *God designed a system of law and chance*. God set up the universe at the beginning in a way that makes evolution possible. On the third view (3), *God influences the events of evolutionary history without controlling them*. On this view, God is understood to give the world much freedom to evolve. God influences evolution through his love, but does not control it.⁶⁷ All of these theories are nuanced and complex proposals, which have results for our theories of divine action and our understanding of the problem of evil, among other things.

These three versions of theistic evolutionism are all united by their acceptance of mainstream Darwinian evolutionary theory. What is excluded is the possibility that a theistic evolutionist might accept parts of evolutionary theory (such as the idea of common descent) while rejecting others (such as the idea of natural selection as the mechanism driving evolutionary change). This type of theistic evolutionism is clearly not the same as literalistic creationism or progressive creationism, though it does not fit into Barbour's definition. However, it has also been historically quite common. Following the Darwinian revolution, the scientific community did not immediately reach a consensus that random mutation and natural selection were indeed the primary force driving evolution.⁶⁸ Many contemporary

⁶⁵ Pennock 1999. See also chapter 6.2 of the present study for further analysis of what the ID theorists think about evolution.

⁶⁶ There is precedent for this within the Christian tradition. St. Augustine (354-430) argued in his *On the Literal Understanding of Genesis* that the Bible did not require a Flat Earth -view incompatible with philosophy, but is compatible with the philosophers' spherical view. Augustine, *De Genesi Ad Litteram* (I, 19).

⁶⁷ Barbour, 1997; similarly Giberson & Yerxa 2002, 172. Peters & Hewlett 2003 is a more throughout presentation of the different varieties of theistic evolutionism.

⁶⁸ Ruse 2003, Bowler 2009, 202-207.

evolutionary biologists are again questioning the centrality of random mutation and selection for evolution.⁶⁹

Within the ID movement, there is some acceptance of a fourth type (4) of theistic evolutionism, which I define as follows: *God controls the direction of evolution in a way that gives us evidence of his action and non-teleological explanations are not sufficient even on the level of biology.* On this view, naturalistic non-purposeful mechanisms do not wholly explain evolution. Michael Behe is a theistic evolutionist in this sense. In his intellectual development, Behe moved from being a theistic evolutionist in the mainstream sense to this fourth category.⁷⁰ Behe accepts the doctrine of common descent as probably true, but does not believe that the Darwinian mechanism of mutation and selection can account for all of life's evolution. Rather, he thinks that an intelligent designer has guided the evolution of life beyond the laws of nature. This type of theistic evolutionism includes critiques of evolutionary biology, and so comes closer to narrower definitions of creationism. Nevertheless, it is worlds apart from literalistic creationism.⁷¹

So, there are ID proponents who fit in each of the different major camps of creationism: literalistic creationism, progressive creationism and theistic evolutionism. If a broad definition of creationism as simply belief in some kind of Creator is used, ID qualifies as creationism. ID also qualifies as creationism under the more narrow definition where creationism requires belief in a Creator and the rejection of the sufficiency of evolutionary explanations on the level of natural science. However, the variety of creationist views embraced by ID proponents shows that there is no necessary conceptual link between ID and any more specific creationist view, such as progressive creationism. ID's conception of creation is quite minimalistic, and can be assimilated under a variety of broader frameworks.

2.2. Naturalistic Evolutionism and ID

Intelligent Design's Struggle Against Naturalism

In addition to the four forms of creationism outlined above, the ideas of Intelligent Design have also been formed at least partly as a reaction against the perceived use of science as a weapon for atheism. ID's vision is to unite all opponents of naturalistic evolutionism in

⁶⁹ Pigliucci & Müller 2010. I will discuss the new developments and the structure of evolutionary theory further in chapter 6.2.

⁷⁰ See e.g. the arguments of Behe 2007a and Behe's autobiographical essay Behe 2006b. The relation of ID to different parts of evolutionary theory will be further discussed in chapter five.

⁷¹ Pennock 1991, chapter 1, Scott 1999, Scott 2004 and Ross 2005 all represent different attempts to map out the relationships between the varieties of creationism analysed in this chapter. Pennock and Scott present a model where the different views form a continuum based on how literalistically the Bible is read, whereas Ross argues that the relationships should be mapped out using more factors than used by Scott and Pennock, and that when this is done, the relationships of the views are far more complex than a simple continuum. For example, Old Earth -creationists and theistic evolutionists can also read the Bible literally. Furthermore, there is substantial variety within each of the viewpoints.

defence of a minimalistic idea of design. Those living inside ID's "big tent" may disagree about particulars, but at least agree on the design argument and about opposing atheistic interpretations of science.⁷²

It seems that the Dawkinsian interpretation of Darwinian evolution is actually one of the major influences behind the emergence of ID theory.⁷³ Richard Dawkins' book *"The Blind Watchmaker: How the Evidence of Evolution Reveals a Universe Without a Designer"* (1986), in which Dawkins argues that the Darwinian theory of evolution supports atheism, is quoted prominently in many major ID works.⁷⁴ Phillip Johnson, the early leading visionary of ID, is reported to have begun formulating his new views on evolution after reading Dawkins' *Blind Watchmaker* and Michael Denton's *Evolution* together. After reading these works, Johnson was convinced that the creation-evolution debate had enormous implications for our worldviews and broader culture. He was also convinced that Dawkins' naturalistic view was scientifically, philosophically and theologically problematic.⁷⁵ So, opposing the atheistic interpretation of evolution was part of the initial motivation of ID.

However, Dawkins' prominence in the ID theorists' works also reflects the public prominence of Dawkins' argumentation. Dawkins' *Blind Watchmaker* remains one of the most in-depth defences of the capability of evolution to explain the origin of complex biological adaptations like the human eye, and his arguments on this point are referenced even in some current textbooks of evolutionary biology.⁷⁶ The ID theorists are therefore not unreasonable to refer to Dawkins' highly influential arguments on the central issue of the capability of the Darwinian mechanism to explain all of life's complexity without design. However, as I will argue in more detail in chapter 6, there are also many other approaches to evolutionary biology besides Dawkins' views.

It is also important to note that Dawkins' anti-religious interpretation of evolutionary theory and his understanding of the mechanisms of evolution are not shared by all. Thus theologian Conor Cunningham argues in his book *Darwin's Pious Idea* (2006) that the Dawkinsian new atheism and Intelligent Design both misunderstand evolution in just the same ways and fail to appreciate the true depth and complexity of evolutionary theory, which is congenial to a theistic interpretation.

Defining Naturalism

The meaning of the term "naturalism" has no very precise meaning in modern philosophy – there are many varieties of naturalists. However, the central meaning of the term derives

⁷² Nelson 2002, Giberson & Yerxa 2002, Numbers 2006, Johnson 2000, Dembski 2005c, Woodward 2003.

⁷³ As Jonathan Loesberger (2007, 107-108) has also argued.

⁷⁴ E.g. Johnson 1991, Behe 2006a, Dembski 2001, Meyer 2010.

⁷⁵ Woodward 2003. William Dembski has also admitted that Dawkins was a central influence in his formulation of the concept of "specified complexity." See the interview in Barham 2012.

⁷⁶ E.g. Freeman & Herron (2007, 98-99).

from the work of self-proclaimed naturalistic philosophers such as John Dewey, Ernest Nagel, Sidney Hook and Roy Wood Sellars. The broad idea of naturalism is to align philosophy closely with science. The most important method for understanding the natural world is thought to be science, and it is believed that there is nothing outside of nature. It is further argued that the function of philosophy is not to construct grand metaphysical theories without science, but to support science in doing its job.⁷⁷

What then is a naturalistic view of evolution? Charley Hardwick gives the following five-point definition of naturalism:

- (1) Outside of nature, which includes humans and their cultural creations, there is nothing.
- (2) It follows from (1) that nature is self-originating.
- (3) Since there is nothing beyond nature, there can be no overarching purpose or goal that would give any lasting meaning to the universe.
- (4) There is no such thing as the "soul", and no reasonable prospect of conscious human survival beyond death.
- (5) The emergence of life and mind in evolution was accidental and unintended.⁷⁸

John Haught argues that scientific naturalism additionally includes the following two points:

- (6) Every natural event is itself a product of other natural events. Since there is no divine cause, all causes are purely natural causes, in principle accessible to scientific comprehension.
- (7) All the various features of living beings, including humans, can be explained ultimately in evolutionary, specifically Darwinian, terms. This belief may be called "evolutionary naturalism".⁷⁹

In the above definitions, "nature" is not defined except by its negation: what is not considered natural. Naturalism is understood to centrally include the denial of the existence of God and divine purposes in nature. However, beyond this point, naturalism includes quite a broad variety of conceptions of what is "natural". A naturalistic definition of what exists might be that everything that exists is composed of the "*stuff described by chemists in the periodic table of the elements*", though even more elementary levels can of course be studied.⁸⁰ However, this is still quite a vague description of what nature contains, especially as many naturalists allow for emergence of properties whose best description seems to more than just chemistry, such as consciousness.⁸¹

⁷⁷ Papineau 2009; see also Ritchie 2008 for an overview of varieties of naturalism.

⁷⁸ Hardwick 1996, 5-6; quoted in Haught 2009, 247.

⁷⁹ Haught 2009, 247.

⁸⁰ Drees 2006.

⁸¹ Though naturalism is often linked with physicalism, the belief that physical stuff is all that exists is not shared by all naturalists. Many also believe that non-physical properties can emerge through physical processes, but ultimately these non-physical properties are of course still dependent on physics. (See Ritchie 2008, chapter 6).

An important rough division can be made within naturalism into soft naturalism and hard, eliminative naturalism. A soft naturalist can accept the reality of mind and purpose, and allow for the emergence of strata of reality which are not reducible to physics and chemistry. A soft naturalist need not think that reductive evolutionary explanations for all of human life can be found. Hard, eliminative naturalists argue that our common beliefs about consciousness are merely “folk psychology” that will in time be replaced with a naturalistic understanding, in which terms such as intention and consciousness are not mentioned.⁸² Goetz and Taliaferro have argued that what the central unifying factor of the varieties of naturalism is actually atheism: what is natural is defined in opposition to belief in God.⁸³ This is perhaps simplistic, because naturalism would seem to (as Haught defines it) also include the denial of the soul and immortality after death. However, the denial of God or any supernatural reality is indeed a central factor in naturalism.

Based on this understanding, naturalistic evolution means simply evolution which can be understood without God. In theory, it is thus possible for a naturalist to believe that evolution was intelligently designed, as long as the designer was not God. For example, one could argue that the first living life form was designed by aliens, or even that the laws of nature we study were engineered by a race of extra-dimensional space aliens. These views would allow a naturalist to support a form of ID. Presumably, this would still be naturalism, as long as these intelligent beings would themselves have evolved from simpler, non-conscious precursors. However, the naturalists in the debate on ID prefer less fanciful explanations of the order of nature in terms of non-purposeful mechanisms. In any case, within naturalism, intelligence and purpose only emerge into the universe only after a long evolution – if their existence even in humans is admitted as real.⁸⁴

Naturalistic evolution can also mean the view that evolutionary biology is positively in conflict with religious beliefs. Even if evolutionary biology is logically compatible with the existence of a Creator, it can be argued that it makes some religious doctrines less credible. The following are examples of proposed conflicts: (1) Contradictions between evolutionary biology and the literalistic, historical reading of Genesis. For example, according to standard Darwinian theory there was always a larger population of early humans, whereas in Genesis human beings can be traced back to one pair of humans. The ID theorists mostly avoid

The definition of nature is problematic. Human conceptions of what nature is have shifted through history, with different notions of nature being socially constructed. (McGrath 2001) A modern naturalist might say that nature is composed of matter and energy, but the boundaries of these concepts have shifted through their history. Cunningham (2010, chapter 6) argues that if even a human mind can be just a clump of matter and energy, this stretches the concepts of matter and energy to the breaking point. Furthermore, if nature means all of reality as well as the foundations of reality, then that could in principle also include God, souls and angels. One could even argue that on the theistic understanding, God’s existence is natural, and the world’s existence is supernatural.

⁸² A naturalist can thus accept that reality can be studied on many different levels, each with its own appropriate methodology and concepts. For example, biology need not be reduced to physics or psychology to biology. Rather, a naturalist can accept a stratified conception of reality (Bhaskar 1979). For an analysis of the many varieties of naturalism, see Ritchie 2008. For a defence of eliminative naturalism, see Churchland 2007.

⁸³ Goetz & Taliaferro 2008.

⁸⁴ Goetz & Taliaferro 2008.

getting into this discussion.⁸⁵ (2) Conflicts between Christian doctrine and the evolutionary account of human history. For example, it has been argued that Darwinian evolutionary biology may require changes to the doctrine of original sin.⁸⁶ (3) Conflicts between evolutionary explanations of religious belief and religious explanations of religious belief. If the cognitive faculties which produce religious beliefs are produced by evolution for some benefit other than creating true beliefs, does this mean we have no reason to trust in our faculties?⁸⁷ (4) Conflicts between traditional Christian morality and attempts to infer ethical principles from Darwinism, such as social Darwinism. Many in the ID community consider this to be a significant conflict.⁸⁸ (5) Conflicts between the Darwinian worldview and Christian doctrine. Michael Ruse argues that if we already accept naturalism in the case of evolutionary history, we should also be inclined to seek naturalistic (non-miraculous) explanations for things like the disciples' experiences of the risen Jesus.⁸⁹ These are questions about the most credible philosophical interpretation of Darwinian evolutionary biology. (6) The conflict between Darwinian explanations of biological complexity and the theological idea that God has purposefully designed the cosmos and life the universe as designed.⁹⁰ Darwinism is thought to reveal a universe without purpose, ruled over by uncaring chance and necessity rather than loving divine providence. This final proposed conflict is the most central in the debate on Intelligent Design, and the one that the present work spends the most time analysing. However, the moral significance of the issues is also in the background of ID's argumentation.

Intelligent Design's Moral and Cultural Critique of Naturalism

The importance of religious, cultural and political motivations for ID's design argument is a contentious issue. Both critics and defenders of ID accept that the ID theorists do have moral and cultural motivations. Critics of ID tend to argue that these motivations distort the ID theorists' capability to evaluate scientific facts in a trustworthy manner.⁹¹ In contrast,

⁸⁵ On the conflicts between creationism and evolutionism, see Numbers 2006 and Ratzsch 1996.

⁸⁶ Ruse 2003.

⁸⁷ For critique of this idea, see Visala 2011 and Leech & Visala 2011.

⁸⁸ For example, the point is argued in the books *Moral Darwinism* (Wiker 2002) and *Darwin Day in America* (West 2007). I will analyse this discussion in some more detail in chapter 8.3.

⁸⁹ Ruse 2003.

⁹⁰ E.g. Dawkins 1991.

⁹¹ The point of the critics such as Forrest and Gross (2004) is not that morality in itself is a bad thing for a scientist to have. Some morality is essential to science. For example, scientists should value the scientific project, value truth, co-operate with other humans and be able to admit their mistakes (Stenmark 2004, chapter 3; see also chapters 8 and 9 for discussion of ideological science). Saying that a scientist has moral motivations does not therefore imply that this scientist is not a good scientist. The argument of the critics is rather that the ID movement's specific moral and religious motivations are not congenial to science, because these moral and religious motivations are thought to direct the ID theorists away from the truth. Preserving a baseless religious viewpoint about the world and advancing its influence politically are thought to be more important motivations

defenders of ID argue that seeking the truth is their primary moral motivation. The religious and cultural importance of the issues merely gives the ID proponents additional moral energy to spend time studying and debating the issues.⁹² Thus Johnson argues that ID wants to free “*science from the thought control of a materialist ideology that forbids scientists to follow the evidence*”.⁹³ The reconciliation of faith and reason is also acknowledged to be an important cultural purpose of Intelligent Design. Thus Stephen C. Meyer argues that “*the theory of intelligent design generates both excitement and loathing because, in addition to providing a compelling explanation of scientific facts, it holds out the promise of help in integrating two things of supreme importance – science and faith – that have long been seen as at odds.*”⁹⁴ Both of these purposes are broadly shared also by defenders of theistic natural theology and researchers in the science and religion community, but the means used are very different.⁹⁵

There is also a theistic argument, the moral argument, which claims that the existence of God has great moral importance at the level of moral ontology. If there is no God, it is claimed, then good and evil are not objective realities, but rather simply the subjective opinions and feelings of individuals and societies. If there is no good Creator who has designed our universe purposefully, then there is no objective purpose to our lives which has been set from the outside. Rather, we must create our own purposes.⁹⁶ Before the ID movement, literalistic and progressive creationists have already emphasized the moral importance of the creation-evolution debate for decades.⁹⁷

Though most of the ID literature emphasizes the importance of science and philosophy, the importance of morality and religious reasons is also prominently present in several

of ID than the search for the truth. It may be that this critique assumes the falsity of the ID theorists’ religion. If their religion were true, then presumably commitment to it would not lead them away from the truth.

⁹² E.g. Menuge 2003.

⁹³ Johnson 2006, 317. According to Johnson, it is the naturalists who are bound by their metaphysics, since materialistic scientism requires a wholly naturalistic story of creation. In contrast, the theism of the ID theorists allows them to consider the evidence more openly. I will come back to this theme in chapters 3.4 and 3.5.

⁹⁴ Meyer 2013, 513.

⁹⁵ Meyer (2013, 513) approvingly quotes Whitehead’s statement: “*When we consider what religion is for mankind and what science is, it is no exaggeration to say that the future course of history depends upon the decision of this generation as to the relations between them.*” (Whitehead 1926, 260).

⁹⁶ There are several ways of answering this problem. First (1), the atheist could change his position and become a theist. If an atheist believes both in the existence of objective morality and that objective morality requires God, then this logically leads to theism. On this view, if one does not want to give up objective morality, one must become a theist. Second (2), the atheist could argue that objective morality does not require the existence of God, but that it can be grounded in something else – Platonic universals, perhaps. Third (3), the atheist could recognize the subjective nature of morality, but argue that this makes no practical difference. All sides of the debate typically agree that atheists can behave morally even if they do not believe in God; the main issue is the logical consistency of atheists rather than their morality. The morality of the atheists is actually presupposed by the argument – the atheist is assumed to seek “good” and evaluate behavior in the light of what he believes to be good. Fourth (4), the atheist could admit that we indeed cannot have morality without God and that this is indeed problematic for our behavior, but that the desirability of the existence of God does not make it true. Fifth (5), the atheist could admit that we cannot have morality without God and celebrate this as a liberating license to do whatever one wishes. So, a multitude of different attitudes and philosophical responses is possible. See further King & Garcia (ed) 2009.

⁹⁷ For some examples, see Numbers 2006, chapters 4 and 5.

works. Phillip Johnson's works *Reason in the Balance* (1995) and *The Wedge of Truth* (2001) begin and end by emphasizing the religious and moral significance of the debate on evolution. For Johnson, our culture's creation myths determine the standard reasoning which our culture applies to "all questions of importance."⁹⁸ The theistic creation story grounds belief in the purposiveness of our existence and the objectivity of morality, while naturalistic Darwinism undermines both.⁹⁹ In Johnson's strategy for changing culture, Intelligent Design functions as a "wedge of truth" which shows the baselessness of materialistic scientism and thus makes room for broader conceptions of rationality. This in turn will make it possible (Johnson hopes) for Western culture to return to belief in objective morality and to approach believing again in the objective truth of the Biblical revelation.¹⁰⁰ For Johnson, Darwinism is thus a worldview and a way of thought, not just a scientific theory. He argues that Dennett and Dawkins give the correct interpretation of evolution, where Darwinian evolution is seen as the universal acid which eats through traditional beliefs, and (if true) as the logical starting point of understanding all of life and culture.¹⁰¹ Johnson's views are highly significant for the ID movement as a whole, since Johnson is universally regarded as the central visionary and leader of the ID movement in the 1990's.¹⁰²

In his book *Moral Darwinism: How We Became Hedonists* (2002) ID proponent Benjamin Wiker constructs a contrast between two different moral viewpoints which he believes have been fighting throughout history. The first of these is theistic morality, which Wiker links with Intelligent Design. The second is "Moral Darwinism", which Wiker traces to the philosophy of Epicurus (340-270 B.C.) and links to evolutionary biology. Wiker's argument is one of the most detailed moral arguments in the ID literature, and it is significant that the back cover carries endorsements from Johnson, Behe and Dembski. In his introduction to Wiker's book, William Dembski calls Intelligent Design "the ground zero of the culture wars". For Dembski, the crucial question behind different ethical systems is, again, the nature of reality: "ultimately, the problem is whether reality at its base is purposive and intelligent or mindless and material."¹⁰³

The Discovery Institute's *Wedge Document* (1999) was originally created for the purposes of presenting ID's vision and cultural importance to financial supporters. The document begins with the idea that human beings are created in the image of God, and reports that this idea has positively influenced the birth of representative democracy, human rights, free enterprise and the progress of science and the arts (in short, all kinds of central achievements of Western culture). The document goes on to say that belief in humans as the image of God is now under attack by the philosophy of scientific materialism, which denies the objective existence of good and evil and devalues human life. Darwinian evolution is

⁹⁸ Johnson 2001, 159.

⁹⁹ Johnson 1995, 7.

¹⁰⁰ Johnson 2001.

¹⁰¹ Johnson & Reynolds 2010.

¹⁰² Dembski (ed.) 2006; Woodward 2003, chapter 4; Forrest & Gross 2004, 16-23.

¹⁰³ Wiker 2002, 11.

understood to provide a central part of the foundation for this philosophy of materialism. Because of this, the challenge of Intelligent Design to Darwinism and to the philosophy of materialism is argued to be culturally important.¹⁰⁴

John G. West's *"Darwin Day in America: How Our Politics and Culture Have Been Dehumanized in the Name of Science"* (2007) is also important for understanding the ID movement's moral vision, since West is the director of the Discovery Institute. West argues that Darwinian scientific materialism has played a crucial part in generating five negative moral phenomena: technocracy, utopianism, devaluing of human life, moral relativism and the stifling of free speech. West does not argue that these consequences follow necessarily from a Darwinian worldview: *"Few actions are the necessary result of any particular set of ideas. People often act inconsistently with their own beliefs. -- People also interpret and apply their beliefs in different ways. -- Again, these consequences may not have been necessitated by scientific materialism, but they were certainly natural and logical conclusions of the materialist worldview."*¹⁰⁵ West sees Intelligent Design as a good antidote to this worldview of scientific materialism.

All of these documents repeat and expand on Johnson's basic idea: a culture's creation myths play a large part in determining the culture's morality, because they strongly influence views of human nature. The mainstream of the ID movement sees the debate on Darwinism and ID as a conflict of worldviews with different standards of rationality and different morality. ID defends the purposiveness of reality, while Darwinism is about reducing reality to mindless material causes. ID is argued to be consonant with objective morality and belief in human value while Darwinism is thought to be more consonant with moral relativism and the devaluing of human life.

So, the ID movement clearly opposes Darwinism as a whole worldview, not just as a scientific theory. The ID theorists believe that this worldview is morally and culturally dangerous, and want to oppose it for these reasons. But they argue that this does not exclude the possibility of other motivations (such as truth-seeking), nor does it follow from this that there could not be something to ID's arguments. In the course of this study, I will repeatedly show that the ID theorists put great emphasis on the importance of the empirical evidence and sound argumentation in the formation of their ideas about design and evolution. The same is also emphasized in their personal historical narratives as told by the ID movement.¹⁰⁶

In the history of science, theories and arguments have indeed been proposed for a great variety of reasons. People, even scientists, are motivated by a multitude of factors, and moral and religious motivations are not necessarily in conflict with the motivation to search for the truth. Rather, moral and religious motivations can also often lead one to have a high regard for truth and to spend much time in ascertaining the truth about some matter. As I will argue in more detail in chapter 2.3, Mikael Stenmark has proposed that we should analyse the relationship of science and religion multi-dimensionally. In the social and

¹⁰⁴ Discovery Institute 2003, 2005; Forrest & Gross 2004, chapter 1; Menuge 2004a.

¹⁰⁵ West 2007, 370-371.

¹⁰⁶ See e.g. Woodward 2003 and 2006; Meyer 2006.

teleological dimension, there can be plenty of interaction between science and religion without jeopardizing the evaluation of the justification of scientific theories. The evaluation of arguments is a separate matter from the motivation of those arguments.¹⁰⁷

It is difficult to accept that different people could honestly and rationally come to a completely different conclusion about some matter. Studies have shown that humans generally have a tendency to explain the opinions of those we disagree with by reference to non-rational reasons, whereas our own opinions are explained by rational factors. So, creationists will tend to explain evolutionary beliefs by reference to the sinful nature of humans, while evolutionists tend to explain skepticism of evolution in basically the same way.¹⁰⁸

The distinction between the objective and subjective rationality is helpful at this point. Some view can be objectively false, and therefore any arguments in its favour are misleading from the objective perspective of truth. However, this does not mean that arguments for such a view could not nevertheless seem convincing from a finite subjective perspective. For example, belief in a geocentric universe was certainly rational for Medieval Europeans, though it was later overthrown by the heliocentric cosmology, which was again overthrown later.¹⁰⁹ Following this line of thought, even if we ourselves reject some view such as ID or Darwinian evolutionary biology as objectively false, it should be possible for us to believe that accepting these views may be subjectively rational for those who believe it. Furthermore, in a democratic culture, it is important to attempt to understand the reasons others have for their beliefs, and attempt to engage in rational dialogue.¹¹⁰ We should strive to use arguments that cannot also be used against ourselves in the same way. In fact, in the debate on Intelligent Design, all parties are partly motivated also by moral and theological motivations. As noted earlier, many critics, too, see the debate on ID as a battle between good and evil. I will note many theological background assumptions on all sides in the course of this study.

In this study, I will attempt to read both critics and defenders of ID charitably and engage in this dialogue with different views. Based on my own reading of the ID material and interaction with some ID proponents, I have gotten a strong impression that the ID theorists do value truth. So, I will not side with the conspiracy theorists. While the full analysis of ID's moral vision is beyond this study, I do want to offer a few remarks that are relevant for the discussion of ID's design arguments.

First, the designer identified in ID's moral argumentation is clearly theistic, not just an unidentified intelligent designer. Wiker argues that there is an "*intelligent designer who has*

¹⁰⁷ Stenmark 2004.

¹⁰⁸ See Harman 2004.

¹⁰⁹ See e.g. Hannam 2011, chapter 18.

¹¹⁰ On this point, see the upcoming work of the Finnish Center of Excellence on Reason and Religious Recognition led by Risto Saarinen.

*created a moral order intrinsic to human nature (and therefore, human beings must act in accordance to the designer's natural moral order)."*¹¹¹

A question arises: why should we act in accordance with the designer's wishes? As I will show in chapter 3.1, the ID movement emphasizes the logical limitations of the design argument and the difficulty of identifying the designer based on just the designer argument. The designer could in principle even be a space-alien. However, if we change Wiker's sentence to read that "*space-alien have created us to have certain moral instincts, and therefore we must act in accordance to their design*", the argument no longer seems at all persuasive. Couldn't the space-alien as finite beings have evil purposes? What if we ourselves gained the capability to design new intelligent forms of life – would these new beings truly be morally obligated to act in the way that we designed them to act, even if we had designed them to be slaves? It seems not. However, if the designer is by definition the supreme moral authority of the universe, and the supreme good, namely God, then it seems more reasonable that we should act according to his moral order. This would then be in line with theistic moral arguments for the existence of God.¹¹² Wiker's argument only makes sense on this more robust concept of the designer, but not on the minimalistic conception used in ID's design arguments. As I will also argue in later chapters, in their argumentation the ID proponents sometimes move like this between a minimal and a theistic conception of the designer.

Second, the presentation of alternative moral worldviews in ID's moral arguments is far too dualistic. Theistic belief in Intelligent Design and materialistic belief in Darwinian evolution are presented as the central competing alternatives, but this bypasses the possibility of theistic evolutionism. Couldn't belief in the purposiveness of reality and traditional morality be combined with belief in Darwinian evolution? The answer of the source material referenced in this subchapter is that theistic evolutionism is a difficult and problematic view, which is perhaps "barely possible", but not as consistent as believing in either theistic intelligent design or Darwinian materialism. The dualistic framing of alternatives also does not take into account that only a minority of naturalists choose to understand naturalism or evolutionary biology as the starting point of moral reasoning.¹¹³

I will analyse Intelligent Design's views on theistic evolutionism and defend theistic evolution in detail in chapter 8. I will argue in that chapter that ID's critique of theistic

¹¹¹ Wiker 2002, 22.

¹¹² King & Garcia (ed) 2009. Wiker (2002) himself admits that he is defending the morality of traditional Christian theism. Wiker's contrast is between a theistic system of morality, where God ensures the objectivity of morality, and relativism, where humans must "construct their own value systems", on a hedonistic or utilitarian basis.

¹¹³ Dawkins (1986, 1) has written that because of Darwinism, we have the basis to argue that there is at bottom no purpose to the universe, and no good or evil. However, elsewhere Dawkins (2006b, chapter 1) has also argued that we humans nevertheless have the capability and duty to act morally. Belief in the importance of goodness is actually one of the foundations of Dawkins' moral critique of religion. It may be that the existence of moral truths does not fit well into Dawkins' understanding of reality, but this needs to be argued further. Mikael Stenmark (2001) has critiqued moral interpretations of science as scientism. A naturalist who rejects scientism could also reject such moral interpretations, and attempt to find other grounds for morality.

evolutionism drives the movement's argumentation toward contradictions. Inadequate grappling with in-depth defences of theistic evolutionism is a large weakness in ID's argumentation.

2.3. Science and Theology

Defining Science and Religion

Understanding the relationship of science and religion is important for understanding the debate on Intelligent Design. A central difficulty comes from the fact that there is no universal definition of either science or religion. The word "science" itself is used in many different ways. For example, in the English-speaking world, the word "science" customarily refers only to the natural sciences, while the German word "wissenschaft" also includes the humanities.¹¹⁴ Even within the natural sciences, there are multiple methodologies, and the content of theories and scientific assumptions have varied widely over time.¹¹⁵ Del Ratzsch, conscious of the difficulties, defines natural science broadly as "*a deeply empirical project aimed most fundamentally at understanding and explaining the natural realm, typically in natural terms.*"¹¹⁶ Science should also be understood as a "stratified phenomenon", encompassing multiple levels of reality. Science can be studied on several levels, including psychological, sociological and theoretical dimensions.¹¹⁷ The nature of science is quite controversial in the discussion over Intelligent Design, and I will discuss it further in chapter three. Ratzsch's definition assumes that science only "typically" explains nature in natural terms, whereas many argue that there are no exceptions to the rule of methodological naturalism.

Defining "religion" is equally difficult. For example, a fairly typical Western definition of religion (used by Ratzsch) is "*belief in a transcendent supernatural being(s), plus (typically) closely associated moral codes, ritual practices, personal/group commitments, convictions concerning meaning, purpose, value, and post-death conscious existence, all integrated into an encompassing world-view.*"¹¹⁸ The most obvious problem with this definition is the exclusion of religions where belief in "transcendent supernatural beings" is not traditionally central, such as Buddhism. But there are also other problems. For example, defining the Christian God as a "supernatural being" has sometimes been contested by Christian theologians, because these are not terms used in the Christian tradition itself, and many would rather speak of God as the "ground of being" or "existence itself" than as a supernatural being.¹¹⁹

¹¹⁴ McGrath 2001, introduction.

¹¹⁵ Brooke 1991.

¹¹⁶ Ratzsch 2009a, 55.

¹¹⁷ McGrath 2002.

¹¹⁸ Ratzsch 2009a, 55.

¹¹⁹ See e.g. Feser 2008, Cunningham 2009, Turner 2002 for critical discussion of seeing God as a "supernatural being".

Philosopher William Alston has provided a more multifaceted definition of religion. Alston argues that we should not think of religion in terms of a single unifying characteristic, but rather a web of characteristics, many of which may be absent from a particular religion. These are (1) belief in supernatural beings, (2) a distinction between sacred and profane objects, (3) ritual acts focused on sacred objects, (4) a moral code believed to be sanctioned by the gods, (5) characteristic religious feelings such as awe, (6) prayer, (7) a worldview, (8) a total organization of one's life based on the worldview, and (9) a social group that more or less follows these tenets. While "religion" refers to the conjunction of a sufficient number of such characteristics, "theology" typically refers to the doctrine and way of thought associated with this religion.¹²⁰

The question of defining science and religion has political importance for many in the debate over Intelligent Design. If Intelligent Design can be defined as "religion" then it can be argued that it should remain outside public schools. However, if it is "science" then it can be taught, it is argued.¹²¹ On the side of ID, Calvert argues that naturalism is clearly a religion, since it includes a fairly comprehensive worldview about human origins and our place in the world.¹²² In response, it seems to me that naturalism has only a few of the religion-making characteristics described in Alston's definition, whereas traditional religions have many. However, the minimalistic idea of ID also has only few religion-making characteristics, though its proponents typically follow some religion. In any case, the legal debate is outside the scope of this study. The take-home lesson from this discussion is simply that when we discuss the relationship of "science" and "religion" or "science" and "theology" we should try to keep the existence of different forms of each in mind.

Models on the Relationship of Science and Theology

According to Ian G. Barbour's famous typology, the relationship of science and religion (as well as science and theology) can be viewed in four ways. According to the *conflict view* (1) science and theology occupy the same cognitive territory and are locked in mortal conflict. A typical example of the conflict view is the positivist idea that history proceeds from theology to metaphysics to science. Science is on the march, and is constantly pushing back the forces of religious superstition. According to the *independence view* (2) science and theology occupy separate domains and do not interact. A typical example of this view is S.J. Gould's division, which places science in the realm of facts and theology in the realm of values and emotion.¹²³ This division is also supported by philosophers and theologians who argue that science and religion are radically different forms of life which do not speak the same language, and whose interaction is thus difficult at best. Between these extremes stand the *dialogue view* (3)

¹²⁰ Alston 1967, summary from Kelly James Clark (2014, chapter 2).

¹²¹ See e.g. Calvert 2009; Forrest & Gross 2004, chapter 8.

¹²² Calvert 2009.

¹²³ Gould 2002.

which holds that science and theology have at least some common ground, on which interaction and dialogue can take place. For example, since the Judeo-Christian doctrine of creation states that God has created the empirical realm, so perhaps we can find traces of his creative work there. The results of science may at least serve to heighten our appreciation of the Creator's greatness. Or perhaps results from psychology and cognitive science can be in dialogue with the theological picture of man. The fourth view is the *integration view* (4) which aims to integrate the viewpoints of science and theology into a comprehensive worldview, usually with the help of philosophy. Though science and theology are still seen as having differences, combining and integrating them is seen as the best way to form our picture of God and reality.¹²⁴

The conflict view is possibly the most common view of the relationship between science and theology on the popular level. Historical study of the relationship of science and theology has shown the truth to be more complex, however. Although isolated cases of real conflict exist, religious beliefs have also helped the growth of science. For example, most of the early modern scientists were motivated by Christian beliefs in the rationality of the natural world which God created. In recent historical study, the relationship of science and religion is argued to be complex, and simpler theories of warfare and total harmony have been set aside.¹²⁵ Even the difficulty of defining science and religion shows the need for a more complex approach: both science and religion are complex and diverse phenomena, and it thus stands to reason that their relationship is complex as well.

Mikael Stenmark's multidimensional model of the relationship of science and religion seeks to do justice to this complexity. Stenmark identifies four different levels of science and religion, on which they can be related. The first (1) is the *social* dimension. Science and religion are both social practices within a particular historical and cultural setting. Barbour's typology focuses on the relationship of scientific theories and religious doctrines. But Stenmark emphasizes that science and religion are also social, human phenomena. The second (2) is the *teleological* dimension. Scientific and religious practices have their own values and goals. The goal of science is understood to be the understanding of reality; the goal of religion can be the same, but is also related to a search for happiness. The third is the (3) *epistemological* or *methodological* dimension: the means developed and used to achieve the goals of science and religion, as well as definitions of rationality. Stenmark argues that the differences in goals lead to different standards of what counts as rational. However, there are also similarities here. The epistemic practices of scientists are human. Though scientists strive to minimize error, it is arguable that their knowledge cannot be wholly independent of authorities, intuitions and personal experiences.¹²⁶ The fourth (4) dimension is the *theoretical* dimension. This means the beliefs, stories, theories, and the like that the practice of science and religion generates.¹²⁷

¹²⁴ Barbour 1997, 77-105.

¹²⁵ For more on this, see e.g. Brooke 1991, Ferngren 2002.

¹²⁶ Ratzsch 2010.

¹²⁷ Stenmark 2004, 268.

Theoretical discourse on the relationship of science and theology typically focuses on the epistemological and theoretical levels. In this study on Intelligent Design, the epistemic and theoretical levels of the interaction of science and religion are also the ones in the spotlight. On the epistemic level, the discussion focuses on the rational justification of belief in an intelligent designer. The discussion on whether theology and worldviews can influence science is also a question on the epistemic level.¹²⁸ On the theoretical level, we can ask whether there is some kind of resonance between the doctrine of creation and the scientific understanding of the world. Proponents of ID argue that nature has much order which is best explained by reference to some intelligent designer. The naturalists of the debate, on the other hand, argue that the success of the natural sciences should lead us to be sceptical of all such explanations.

The Possibility of Dialogue

One possible way of dismissing dialogue between theology and science unimportant is to show that science and theology are too different to interact in any meaningful way. There are many ways to defend such an *independence view*. For example, it can be argued that theology and science are two entirely different language games, and that religion is not really concerned with the realm of empirically accessible facts, as science is. This position is known as *Wittgensteinian fideism*.¹²⁹ Some also argue that the theistic metaphysics underlying much of natural theology (to be introduced in chapter 2.4) is in error. Theistic metaphysics requires a realistic notion of religious language, but some argue that religious language is more like poetry and music, merely expressing emotions but not trying to say anything about God.¹³⁰

This type of philosophical criticism of the dialogue between science and theology is often put forward as a neutral description of religion, merely correcting misunderstandings about the grammar of faith. In these accounts, theology and science are thought to be so different that there is no common ground and no connections. One problem arises from the vagueness of the concept of religion. It seems clear that there are many forms of religion, and some of these may indeed be antirealist and totally separated from all forms of science. However, other forms of religion presuppose metaphysical realism and allow for interaction with natural science.¹³¹

Reading histories of the relationship of Christianity and natural science, it seems evident that some forms of science and religion have interacted in many ways historically.¹³²

¹²⁸ Stenmark 2004.

¹²⁹ E.g. Phillips 1994.

¹³⁰ Phillips 1994.

¹³¹ For good examples of theological realism and antirealism, see McGrath 2001 & 2002. It is important to keep in mind that theological realism can be accepted independently of accepting natural theology. A fideist can also be a theological realist who believes in the mind-independent existence of God.

¹³² Wykstra 2001.

For example, the metaphysical beliefs underlying modern science, such as belief in the world's orderliness, arguably have a Christian foundation.¹³³ Peter Harrison argues that the idea of the fall also played a role in the rise of modern science, because the recognition of man's sinfulness (and thus capability to err) was used to argue for the necessity of peer review.¹³⁴ The idea of a historical flood caused many scientists to look for evidence of the flood in geological sediments. Thus research which in time overturned the literalistic interpretation of Genesis had religious beginnings.¹³⁵ These are just a few examples of a positive interaction between science and religion. These, and the existence of natural theology itself shows that not all forms of religion are antirealist, and that there have historically been connections between some forms of religion and science.

While the idea that there is a complete separation between science and theology can sound like a neutral description of the issue, it actually means judging many apparently religious ways of thought to be outside the realm of true religion. The independence view is thus not just descriptive, but requires a normative element as well. It seems that if we want to really describe the complex relationship between different forms of religion and different forms of science, we will need to compare our philosophical ideas about religion and science with the actual historical and current interaction of different forms of religion and science. In this material one can find many differences between religion and science, but also many commonalities and common ground where meaningful dialogue has occurred. The reality of dialogue between science and theology in the past makes me open to dialogue in the present, as well.¹³⁶

I have argued that science and theology are not so independent that they have no common ground at all. However, proponents of independence views have made some valid points in trying to explain differences between science and theology. Science and theology are certainly different, and we should not make them mean the same thing. Michael J. Murray has helpfully compared the relationship between theology and science to a marriage partnership. In a functional marriage, both partners must respect each other and each other's differences. The relationship of science and theology should not be a "doormat relationship" in which one party holds dominion over each other. The strongest expression of the dominion of science over theology is in *scientism*, the belief that science is the only or at least our overwhelmingly best way of gaining knowledge about anything. The strongest expression of the dominance of theology over science is in literalistic Young Earth - creationism, in which the interpretation of scientific research is completely subordinate to the

¹³³ Burt 2003.

¹³⁴ Harrison 2009. Of course, this does not mean that the human capacity for error was only discovered because of Christianity. Harrison simply argues that historically, the doctrine of the Fall was a central argument and motivating factor for the necessity of scientific communities and peer review.

¹³⁵ Browne 2003.

¹³⁶ In this I am not being particularly brave or original, because belief in the possibility of mutually beneficial interaction is part of a broad consensus of religion and science studies which has emerged in the last decades. Typical articles in any handbook or encyclopaedia on the issue present many examples of positive interaction. (See e.g. Clayton & Simpson 2006).

Young Earth -reading of the Bible. In my view, Murray is correct in rejecting both of these methods in favour of dialogue.¹³⁷

But how does the interaction between science and theology work in practice? Possibly the most in-depth model of this interaction is Robert John Russell's model of *creative mutual interaction* (CMI). Russell is a critic of Intelligent Design, but relating ID to Russell's model nevertheless helps understand the nature of ID's project. In Russell's model, theology and science are separate enterprises which often work on different types of questions. However, both are concerned with truth, and there can be much benefit to their interaction. Theories from science can act as data which can be interpreted and explained within theology, but also as constraints which rule out some theological ideas about the world. For example, the theistic arguments of natural theology provide a theological explanation or interpretation of some scientific discoveries, such as the fine-tuning of the laws of nature or the origin of the cosmos in the Big Bang. Furthermore, there are cases where science has reached its limits, and points beyond itself to the possibility of theological discourse. The results of science and also favor some theological perspective over others, such as the scientific evidence against the claims of literalistic creationism. Often, scientific discoveries have to be interpreted through some philosophical framework before theological implications can be gleaned, however.¹³⁸

But in Russell's understanding, the influence can also run in the other direction, from theology to natural science. Theology has historically grounded the philosophical assumptions that have provided the foundations for natural science, such as the orderliness and comprehensibility of the world and the necessity of empirical research. But theology's influence can even extend to motivating new scientific projects, and evaluating a priori which research programme seems most likely to succeed. An interesting example of this, which Russell often uses, is Fred Hoyle's defence of steady state cosmology, which was initially motivated by Hoyle's strong dislike of the apparently theistic implications of Big Bang cosmology. In this case, Hoyle began with a theological (atheistic) motivation, and went on to develop a full-fledged scientific theory which would be more consonant with his atheism.¹³⁹

As I will argue in more detail in the following chapters, the influence runs in both directions – from science to theology and from theology to science – also in Intelligent Design thought. ID is thought to provide scientific evidence that resonates with the theological belief in a Creator, though the evidence of design is not alone sufficient to prove the existence of this Creator. ID also sees influences from theology into science. As noted in chapter 2.2, ID's project of finding evidence of design in the universe is motivated by theistic philosophy and theistic moral concerns in addition to purely scientific motivations (such as the search for scientific truth). However, these motivations are thought to be unnecessary for

¹³⁷ Murray 2009a; see also Stenmark 2004, chapters 8-9.

¹³⁸ Russell 2008, 303.

¹³⁹ Russell 2008, 305. For further discussion of Russell's model, see also Peters & Hallanger 2006.

understanding ID's scientific argument. The ID theorists also make the point that belief in the designedness of the cosmos and life has historically been quite beneficial for natural science. They also see the same kind of interaction between science and (atheistic) theology in Darwinian evolutionary biology. Darwinian evolutionary biology is thought to be influenced by materialistic philosophical biases. Also, the theory of Darwinian evolution is thought to provide a significant challenge to theistic belief, when coupled the philosophical framework of scientism. ID is seen as the best way to answer this challenge.

In Russell's model, such extrascientific motivations and the interpretation of scientific results through philosophical frameworks are to be expected. So, in a way, Russell's model also helps understand the structure of ID's argumentation. Nevertheless, though this use of the model clarifies the way ID thinkers themselves think of their project, ID's claim to be science has been questioned. For example, Russell himself does not accept either ID as an example of creative mutual interaction. This is because Russell regards design as a theological, not a scientific explanation. So, ID seems to be inserting a theological explanation within science, rather than respecting the integrity and autonomy of science and theology, as Russell's model of creative mutual interaction does.¹⁴⁰ According to Russell, theistic and atheistic interpretations of evolution should be presented as theological and philosophical arguments, rather than as part of science.¹⁴¹ I will return to these arguments in the coming chapters.

Some Problems of Scientism

"Scientism" is a word that has already come up several times, so some further clarification of its meaning is in order. What I have in mind is what Mikael Stenmark has termed "epistemic scientism": "*The view that the only reality that we can know anything about is the one science has access to.*"¹⁴² Furthermore, in this view science – and typically natural science is meant here – is believed to be the only or at least the most reliable way of gaining knowledge about reality. Sometimes an even stronger scientific view which Stenmark terms *rationalistic scientism* is advocated in connection to epistemic scientism. This is the view that "*we are rationally entitled to believe only what can be scientifically justified or what is scientifically knowable.*"¹⁴³ If we accept this strong form of scientism, rationality of belief in God, for example, would require evidence at least comparable to the evidences used in science. However, scientism is very problematic. Since the issue will come up many times over the course of this study, I will now present four lines of critique against scientism.

First (1), scientism appears to be self-refuting. Epistemic and rationalistic scientism are not themselves results of scientific enquiry, but philosophical viewpoints. So if we are

¹⁴⁰ Russell 2008, 214-215.

¹⁴¹ Russell 2008, 6.

¹⁴² Stenmark 2001, 4.

¹⁴³ Stenmark 2001, 6.

justified in believing in scientism or if scientism counts as reliable knowledge, then it seems that we can have knowledge and rational beliefs outside of science anyway, and scientism is refuted.¹⁴⁴

Second (2), the practice of natural science itself requires a broader conception of rationality. In order to perform experiments as part of a community of natural scientists, one must have some trust in experience, the veracity of our beliefs about other minds, our ability to plan intentionally, the ability of experiments to shed light on hypotheses and so on. It is difficult to see how natural science could be more reliable than the beliefs that its practice is based upon. Therefore, it seems that if natural science is reliable, reliable knowledge and rational beliefs must also be possible outside natural science.¹⁴⁵

Third (3), most of our everyday beliefs would be irrational, if we were to accept rationalistic scientism. The methods of science require strict conditions and typically aim at solving highly specialized problems. We cannot present scientific evidence even for such simple beliefs as “my wife loves me” or “I love my wife” (unless we adopt a very broad definition of “science”). However, even scientists cannot help but have such beliefs.

Fourth (4), in practice it seems that many presentations of “the scientific worldview” are not actually based merely on natural science, but are more like philosophical interpretations of natural science. It has proven exceedingly difficult to construct a whole worldview based on natural science.¹⁴⁶

Instead of scientism, I posit that we should be open to the interaction of science, philosophy and theology without devaluing any of these or trying to make them into something they are not. We should not reduce theology into science nor science into theology, even if we find common ground and even some commonalities in rationality. However, having some sort of reasons in support of belief in God need not mean that theology is thereby reduced to scientific reasoning. This would only be true if science were the only way to provide rational reasons for belief.¹⁴⁷ The problems of scientism do not automatically prove that religious beliefs are true, but they do open the way for constructive and critical dialogue between natural science and theology.

If we want to see positive interaction between theology and the natural sciences, we need to accept two premises in addition to the rejection of scientism. First, we need to suppose that theology and the natural sciences have some common ground which makes

¹⁴⁴ Stenmark 2001, 32-33.

¹⁴⁵ As Del Ratzsch (2010) argues, some such commonalities in rationality seem inevitable, because both science and religion are human enterprises. Popular beliefs to the contrary, studies of actual scientific and religious practices show that there are surprising amounts of similarities. Science is also influenced by intuitions, authority and traditions, and religious belief is also influenced by evidence (such as personal experiences or philosophical arguments). Nancy Murphy (1993) has similarly compared theological rationality to that of scientific research programs.

¹⁴⁶ An amusing example of this is produced by Denis Noble (2008, 13). Noble analyses Dawkins’ concept of “selfish genes” and shows how this interpretation went beyond the biological data, and how current research is correcting this conception. (Noble 2013 goes further in this direction). See Stenmark 2001, chapter 2 for some further examples.

¹⁴⁷ Stenmark (2001) presents a more thorough critique of scientism.

dialogue possible. Second, we need to suppose that evidence and explanations are also somehow relevant in theology. A theological anti-realist who does not believe that religions make truth-claims will typically have little interest in the dialogue between science and theology.¹⁴⁸ For the purposes of this study, I will accept these assumptions, which are also important for the ID movement.

2.4. Natural Theology

Understanding Natural Theology

The Intelligent Design movement generally emphasizes that ID is a scientific, not a theological idea. However, ID is also conceived of as revealing a connection between theology and science. Scientific evidence for the existence of some designer behind nature is seen as evidence consonant with the Christian doctrine of creation. In the Christian tradition, such connections between Christian doctrines and publicly available evidence have traditionally been explored under the name of *natural theology*. It will therefore be important to connect my analysis of the ID movement's thought to the concept of natural theology.

According to John Hedley Brooke, "*natural theology is a type of theological discourse in which the existence and attributes of the deity are discussed in terms of what can be known through natural reason, in contradistinction (though not necessarily in opposition) to knowledge derived from special revelation.*"¹⁴⁹ However, as Brooke goes on to point out, the definitions of "natural reason" and "revelation" have been understood differently in differently cultures and different times.¹⁵⁰ Broadly speaking natural theology speaks of knowledge of God available through human observation, memory and rational intuitions, as well as arguments based on them.¹⁵¹ There are other definitions of natural theology, and the relation of natural theology to theologies of nature is much discussed. I will return to this issue at the end of chapter 2.4.

The Historical Importance of Natural Theology

Natural theology has a long history. The idea of natural knowledge of the divine can already be found in the Greek philosophies of nature as well as in the Bible and in the writings of many Church Fathers. The standard biblical proof text for natural theology has long been Romans 1:20: "*For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are*

¹⁴⁸ For a good defence of realism in Christian theology, see McGrath 2002.

¹⁴⁹ Brooke 2002, 163-164.

¹⁵⁰ Brooke 2002, 164. A more thorough discussion of the change of the concept of "reason" and the influence of this change on theology can be found in Turner 2002.

¹⁵¹ Plantinga 2011, 48.

without excuse." Acts 14:17 states that God "has not left himself without testimony: He has shown kindness by giving you rain from heaven and crops in their seasons; he provides you with plenty of food and fills your hearts with joy." These and other passages like them do not present arguments for the existence of God, but some idea of the common availability of knowledge of God nevertheless seems to be present.¹⁵²

Although some early Christians took a negative attitude to philosophy, many early Church fathers nevertheless took a positive attitude to natural theology and tried to find connections between Christianity and Greek philosophy.¹⁵³ For example, Augustine writes that "though the voices of the prophets were silent, the world itself, by its well-ordered changes and movements, and by the fair appearance of all visible things, bears a testimony of its own, both that it has been created, and also that it could not have been created save by God, whose greatness and beauty are unutterable and invisible."¹⁵⁴ Here Augustine says that the order of the world is evidently created by God, and that this could be known even without the prophets. In many places the Church Fathers also support their views with philosophical arguments.¹⁵⁵ However, in their writings, faith and reason are arguably conceived as a holistic unity rather than making a sharp distinction between the deliverances of reason and the deliverances of faith.¹⁵⁶ In the Middle Ages, natural theology was developed further by theologians such as Anselm (1033-1109), Bonaventure (1221-1274) and Thomas Aquinas (1225-1274).¹⁵⁷

The closest parallels to the design arguments of the ID movement come from the arguments of early modern scientists rather than from classical or medieval thought, however. Sir Isaac Newton's (1642-1727) design arguments were based both on the harmonious order of the natural laws and the solar system as well as the order in biology. The apex of this pre-Darwinian natural theology is typically thought to be the design arguments of William Paley (1743-1805) in his *Natural Theology: Or, Evidences of the Existence and Attributes of the Deity* (1802). While Paley focused on the biological evidences for design, thinkers like James Hutton (1726-1797) and Joseph Priestley (1733-1804) focused attention on the system of nature as a whole, Hutton on the geological processes which maintain the Earth's fertile soil and Priestley on the role of vegetation in maintaining the quality of air. The laws of nature were viewed as the supreme designer's harmonious design.¹⁵⁸ In this British fusion of natural science and natural theology, it was believed that the natural sciences provided powerful support for belief in God.¹⁵⁹

¹⁵² For analyses on Biblical natural theology, see Barr 1993 and Rowland 2013.

¹⁵³ Ferguson 1999.

¹⁵⁴ *De civitate dei*, XI, 4.

¹⁵⁵ Irenaeus, *Against Heresies*, II: 1-9; Gregory of Nyssa, *On the Soul and Resurrection*, chapter 1; Augustine, *On Free Will*, 2.12.33. I have found these examples through Swinburne (2004b, 536).

¹⁵⁶ McGrath 2001, chapter 6; Kirjavainen 1984. On the evolution of the concept of reason see Turner 2002.

¹⁵⁷ See further Hall 2013 and Feser 2008.

¹⁵⁸ Brooke 2002, 170. Natural theology also provided a way of defending the legitimacy empirical science in theological terms: God had created a rational world and had meant for humans to study and understand it. Natural theology united Christians of several different persuasions (Brooke 1991, 2002).

¹⁵⁹ Brooke 1991, see also McGrath 2009b.

Philosophical and Scientific Critiques of Natural Theology

Modern times also brought new challenges to natural theology. In traditional Christian natural theology knowledge of God found through reason was not thought to be in any way better than that received through the Church and through faith. However, the religious conflicts following the Reformation made many long for some universal criterion for adjudicating between competing religious truth claims. The success of the natural sciences gave hope of the possibilities of human reason to work as such a universal arbiter. Natural theology was also sometimes separated from the broader web of Christian beliefs. Deism, a religion of reason rejecting revelation and the authority of the Church as sources of knowledge, was born. Most of the Enlightenment philosophers who were critical of religion (such as Voltaire, 1694-1778, and Thomas Paine, 1737-1809) were deists who practiced natural theology and believed in the existence of a Creator God. The number of deists was smaller than has often been later stated, but they have exercised great intellectual influence. The relationship of faith and reason has been problematized far more often after the Enlightenment.¹⁶⁰

In later discussions the critiques of natural theology made in the 18th and 19th centuries has often been seen as devastating, though it has never caused natural theology to disappear. There have been three main lines of critique against natural theology: philosophical critique, scientific critique and theological critique. In this chapter I will only give some broad outlines of this critique. Since many of the philosophical and scientific critiques of natural theology are repeated in the discussion on Intelligent Design, they will be analysed more in the course of the coming chapters. However, the relevance of theological critiques of natural theology to Intelligent Design has not been discussed as much. I will thus discuss natural theology and the general relation of faith and reason in chapter 2.5.

The most influential philosophical critiques of natural theology and the design arguments have been presented by the Scottish sceptical philosopher David Hume (1711-1776) and the German philosopher Immanuel Kant (1724-1804). In his *Dialogues Concerning Natural Religion* Hume analyses the arguments of natural theology and comes to the conclusion that they do not prove anything very certain about the original cause of the cosmos. At most it might be said that the cause of the cosmos bears some distant similarity to a human mind. For Kant, reading Hume's arguments was like waking up from a "dogmatic dream." His *Critique of Pure Reason* is sustained critique of natural theology. Kant comes to the conclusion that one cannot say anything about a transcendent Creator based on the phenomena included in human experience. The design argument can at most show the existence of some sort of "architect" of the universe, a conclusion insufficient for religion. In his later works Kant grounds belief in God as necessity for the operation of "practical reason" rather than the arguments of natural theology.¹⁶¹

¹⁶⁰ Barnett 2004, Harrison 2002, Livingston 2007.

¹⁶¹ Chignell 2009.

Scientific critiques of natural theology have been made particularly on the basis of Charles Darwin's (1809-1882) evolutionary theory. Prior to Darwin's theory, the dominant explanation for the complex adaptations of species was divine design. Thus Isaac Newton believed that the structure of the eye was obviously made by a designer well versed in the principles of optics. But Darwin's theory offered a way of explaining the adaptations of species on the basis of his theory of natural selection, without reference to design. Darwin's theory was silent about the origin of life and the laws of nature, however, and the wider teleology of the laws of nature became the new focus of natural theology. Many saw biological evolution as simply God's way of creating the species.¹⁶² Nevertheless, atheistic interpretations of Darwinism were also presented, and they continue to be common. As noted, Dawkins' argument that evolutionary theory makes it possible to be an "intellectually satisfied atheist" is quoted prominently in ID literature.¹⁶³

Philosophical ideas often associated with natural science have also played a part in the waning of natural theology. Within the natural sciences, mechanistic explanations in terms of laws and natural factors have been highly valued from the beginning. Already one of the important fathers of modern natural science, Francis Bacon (1561-1626), argued that the Aristotelian explanations in terms of purposes are not very helpful for science. Rather, science seeks understanding which is useful for achieving technological mastery over nature.¹⁶⁴ For Bacon the mechanistic universe studied by science was indeed the purposeful creation of God, and testified of the greatness of God. However, over time, it became possible to argue that mechanistic nature indeed is all that exists, and talk of divine purposes is also meaningless outside natural science.¹⁶⁵

As I will show in chapter 8, the ID theorists often argue that restricting natural science to a search for merely natural explanations will over time indeed tend to lead to a naturalistic worldview. That is, methodological naturalism will tend to lead to metaphysical naturalism. However, in practice many methodological naturalists are indeed simultaneously believers in divine purposes and natural theology. Already before Darwin, many theologians and religious believers believed that the Creator's glory is apparent in the way he works in the universe through natural laws.¹⁶⁶

¹⁶² McGrath 2009, chapter 7.

¹⁶³ Dawkins 1991, 6; Loesberg 2007, 107-108. The title (*How to be an Intellectually Fulfilled Atheist (Or Not)*) of Dembski & Wells 2008 even uses Dawkins' words directly. The work counters Dawkins' atheism by arguing against evolutionary theory.

Scholars have differed on the relative importance of the Darwinian and Humean critiques of the design argument. Sander Gliboff (2000) argues that the Humean critique together with pre-Darwinian speculations about evolution is enough to dismiss the design argument, and Dawkins thus wouldn't have to give up his atheism even if he were living before Darwin.

¹⁶⁴ *Novum Organon*, Book II. It can be argued that Bacon misunderstands the Aristotelian system of four causes. However, it remains true that this understanding of science is common in modernity (Feser 2008, 174-180).

¹⁶⁵ Brooke 1991, chapter 4.

¹⁶⁶ See Numbers 2003 for one account of the complex historical development of methodological naturalism. On the complexity of the interaction between Darwinism and teleological ideas, see Ruse 2003 and Bowler 2009. These works also discuss the important social and cultural background of the development.

Rather than methodological naturalism as such, the combination of methodological naturalism and scientism can form the basis for rejecting all natural theology. Suppose that natural science is our only (or overwhelmingly best) way of gaining reliable knowledge or justified beliefs, and natural science can never speak of metaphysical and supernatural things. This implies that the traditional arguments of natural theology are meaningless, since they are by definition outside naturalistic science and arguments outside science are not reliable.¹⁶⁷ This type of scientism is influential in the contemporary discussion, and I have critiqued it chapter 2.3.

Theological critiques of natural theology were made already prior to Darwin. For example, Neo-Protestant theology following in Kant's wake rejected natural theology on philosophical grounds, and attempted to find another way to ground theological claims. But the critique of natural theology presented by the Swiss theologian Karl Barth (1886-1968) has possibly exerted even greater influence. Barth worried that all natural theology inevitably subordinates theology under some outside criterion, and so theology becomes a servant of fallen human reason. The God of the philosophers is inevitably different from the Trinitarian God of Christianity, and so natural theology ends up corrupting Christianity. According to Barth, theology must stand on its own foundation, the revelation of God. Barth's critique of natural theology was not based on just academic concerns, but also on a fear of the practical consequences of accepting natural theology. Nazi-friendly theology had the same problem of subordinating theology to human reason and ideological concerns.¹⁶⁸

The Renaissance of Natural Theology

Despite the critiques, natural theology has never disappeared. Barthian theological critiques of natural theology have not had much traction in the Catholic Church, for example.¹⁶⁹ Since the renaissance of analytic philosophical theology starting from the 1960's, natural theology has also been making a comeback. The arguments of natural theology have many modern defenders and the traditional critiques are no longer necessarily seen as conclusive.¹⁷⁰ University presses are publishing large tomes on natural theology like the *Blackwell Companion to Natural Theology* (2011) and the *Oxford Handbook of Natural Theology* (2013).

Though there are many forms of modern natural theology, the one closest to Intelligent Design is related to philosophical theism, theism meaning belief in the existence of the

¹⁶⁷ One influential way of defending this sort of scientism has been logical positivism, dominant in Anglo-American philosophy in the 1930s to 1960s but now considered refuted. The logical positivists argued that all metaphysical philosophy and theology was meaningless since it did not satisfy the verification criterion of meaning, according to which all meaningful statements which are not a priori truths must be verifiable empirically. See Wolterstorff 2009.

¹⁶⁸ See Brunner & Barth 2002 [1934], White 2010, and Holder 2012 for more on this discussion.

¹⁶⁹ See Turner 2004.

¹⁷⁰ Prominent defenders and critics of natural theology agree on this point. For example, see the evaluations of Humean and Kantian arguments by Swinburne (2004a, 2011) and Philipse (2012).

Creator of all things who is personal, immaterial, eternal, perfectly free, omnipotent, omniscient, and perfectly good.¹⁷¹ The relationship of the Intelligent Design movement's design argument to theism is a complex issue, which will be explored in the coming chapters. However, traditionally the design argument is one of several theistic arguments for the existence of an omnipotent, omniscient and benevolent deity who created the universe and whose providence watches over it.¹⁷² The cosmological argument, for example, portrays God as the necessary ground of our contingent being. It is based on the classic question "why is there something rather than nothing?"¹⁷³ Many of the theistic arguments are metaphysical and not dependent on the empirical findings of natural science in the way the ID movement's design arguments are.

Whereas many critiques of natural theology assume that the project fails if there is any way to deny the conclusions of the theistic arguments, modern natural theologians typically see even modest conclusions as significant. Perhaps it is too stringent to demand that any useful natural theology must provide certain and deductive proofs of God's existence whereby all who hear the proofs will be throughoutly convinced. Very few things in natural science, philosophy or everyday life can be known with such certainty. An argument may provide good evidence for the existence of God even if it doesn't meet this stringent standard.¹⁷⁴ Thus Richard Swinburne, perhaps the best-known contemporary natural theologian, argues in his work *The Existence of God* only to the conclusion that the probability of theism being true is over 50 percent after considering several cumulative arguments which each raise the probability by some amount. The arguments from religious experience then finally raise the probability above 50 percent.¹⁷⁵

Another strategy for defending natural theology from critique has also been to redefine it. The typical division is between natural theologies and theologies of nature.¹⁷⁶ Whereas natural theology seeks to speak of God based on human reason and experience and start outside religious traditions, theologies of nature start from within a religious tradition such as Christianity and then seek to form a theological interpretation of nature in dialogue with the natural sciences. Theologies of nature do not seek to establish the existence of God through any supposed neutral starting point, but can find resonance and correlations with Christianity and human culture. However, the precise border between these different approaches can be difficult to determine. Theologian Alister McGrath is a theologian of nature by these definitions, but he himself calls his enterprise natural theology. McGrath's basis for this is his desire to join into the Christian tradition of natural theology and not be constricted by definitions of natural theology made in the time of Enlightenment.¹⁷⁷ Both

¹⁷¹ Swinburne 2004a, 7.

¹⁷² Plantinga 1990 [1967], chapter 4.

¹⁷³ For an interesting defence of the reasonability of this question, see Turner 2004.

¹⁷⁴ Plantinga 1990 [1967], ix-x.

¹⁷⁵ Swinburne 2004a. Swinburne's probabilities are based on his extensive use of Bayes' theorem to quantify as far as possible the significance of the different lines of evidence for theism.

¹⁷⁶ The distinction comes from Ian G. Barbour (1997, 100).

¹⁷⁷ McGrath 2008, Padgett 2004.

theologians of nature and natural theologians can also refer to the same evidence, such as cosmic fine-tuning, as supporting religious belief.¹⁷⁸

2.5. Theological Critiques and Defences of Natural Theology

Two theological critiques of natural theology also relevant for the ID movement are the *fideistic critique* of natural theology and the *critique of idolatry*. The fideistic critique concerns the place of natural theology in the Christian faith, and the critique of idolatry concerns the relationship between the Trinitarian God of Christianity and the “God of the philosophers” of natural theology. Both are also relevant for the discussion on Intelligent Design. First, if evidence has no place in Christian religious belief, then approaches like natural theology and ID are religiously irrelevant, perhaps even harmful. Second, if natural theology’s argument for the existence of theistic God cannot help but construct an idol, then surely ID’s design arguments aiming to show the existence of an unspecified “intelligent designer” will also do so. I will begin with the fideistic critique.

The Fideistic Critique of Natural Theology

Broadly understood, fideism is the idea that religious faith is independent of philosophical arguments for theism or even opposed to such evidential reasoning. In my view, this viewpoint is correct in arguing that religious rationality should not be reduced to that of the natural sciences, and we should avoid excessive rationalization of theological language. The generation of religious beliefs is a complex process involving many different types of reasons, many of which are not as important in science.¹⁷⁹

The fideistic critique of natural theology emphasizes the differences of religious belief and scientific theories. For example, D. Z. Phillips argues that seeing God as a hypothesis to explain the world is contrary to the actual nature of religious belief. Hypotheses are always uncertain, but for many believers God is their fundamental ground of being, an absolute certainty and not a hypothesis.¹⁸⁰ Though he does not classify himself as a fideist, Alvin Plantinga similarly argues that Christian belief does not originate in looking for explanations, but in the self-revelation of God: “*Believers in God do not ordinarily postulate that there is such a person, just as believers in other persons or material objects do not ordinarily postulate*

¹⁷⁸ Compare Swinburne’s (2004a) and McGrath’s (2009b) uses of the fine-tuning evidence, for example.

¹⁷⁹ Olli-Pekka Vainio (2010) provides a good classification of different types of fideism. Fideism is commonly defined as faith completely disconnected from rational reasons. However, I have used a broader definition, because Vainio argues persuasively that such extreme fideism is historically rather rare.

¹⁸⁰ Phillips 1976; see also Koistinen 2000 for similar arguments against Swinburne’s evidentialist theism and Moore 2007, 398-399.

that there are such things.”¹⁸¹ According to Plantinga, hypotheses are necessary for scientific theories, but Christians do not postulate God as an explanation, but receive knowledge of God through the action of the Holy Spirit on their *sensus divinitatis*.¹⁸²

A central difference between natural theology and theologies of nature is in how much knowledge of the divine can be gained based on reason (broadly understood, including observation, memory, rational intuition, arguments and so on) without reliance on divine revelation mediated through a religion like Christianity. In theologies of nature, interpreting nature properly as God’s creation requires a pre-existing religious view. For example, Alister McGrath argues that no concept of “reason” or “nature” is truly universal and objective. Rather, these concepts themselves are cultural constructs, and an atheist’s conception of reasonability can be quite different from a Christian’s. Thus the same order of nature can be full of evidence of divine wisdom for the Christian, even while the atheist sees only the work of blind and uncaring chance and necessity. McGrath argues that nature is open to many interpretations, and though something of the transcendent can be glimpsed even starting outside any religious tradition, only the mind enlightened by Christ can perceive that nature testifies of God. However, McGrath simultaneously also argues that a Trinitarian Christian view also explains properties of nature like its comprehensibility and fine-tuning better than competing views. A theology of nature seeks to make such resonance between Christian views and natural science visible, but does not seek to conclusively prove the truth of Christian belief in creation.¹⁸³

By contrast, the arguments of natural theology are based on the idea that there are sufficient commonalities in different views about reason and nature to make convincing arguments about God possible even without assuming Christianity as a starting point. Natural theology can still be based on quite a broad understanding of “rational belief” and religious belief does not need to be understood merely as a scientific hypothesis. For example, one of Swinburne’s principles is that we should have a *prima facie* trust in human experience and the beliefs produced by our cognitive mechanisms. If I find myself with the belief that there is a book in front of me, then I am justified in believing that there is a book in front of me unless I am also in possession of some strong counterargument to this belief. Swinburne is willing to grant that belief in God can also often be a “basic belief” like this. Thus if someone believes that they are experiencing the presence of God, they are *prima facie* justified in believing that God is present. Trust in other’s testimony about the existence of God or trust in religious authorities can also function as a source of justified religious belief. This means that medieval villagers, for example, were rational and justified in their belief in God. However, Swinburne argues that in modern times this sort of basic belief in God faces many challenges which make the arguments of natural theology necessary. In addition to

¹⁸¹ Plantinga 2000, 370.

¹⁸² Plantinga 2000.

¹⁸³ McGrath 2008.

religious authorities and basic beliefs, there are also atheistic authorities, atheistic basic beliefs and atheistic arguments.¹⁸⁴

Responding to the Fideistic Critique

I think the fideistic critique captures something essential about religious beliefs. The origins of religious beliefs are complex and different for different religious people, but for the historical Christian community belief in the Creator God has certainly not been conceived of as a hypothesis. However, as McGrath has argued, this does not mean that the doctrine of God could not possess explanatory potential. McGrath argues that Christian doctrine also has an important explanatory dimension. For example, the Christian tradition contains explanations for the religious experiences of Christians and the development of Christian beliefs such as the resurrection of Jesus. Furthermore, the doctrine of creation can help us understand why the world has a rational order.¹⁸⁵

Stenmark has provided an interesting metaphor for why a religious believer might consider it useful to engage in a theoretical discussion about evidence for the existence of God, even if belief in God is not primarily a hypothesis for the believer. Consider my belief that my wife loves me and is a wise and loving woman. These beliefs are grounded in my entire life-experience with my wife, and my belief in them is not a hypothesis. Nevertheless, suppose that someone else does not believe that my wife loves me, or has doubts about her virtuous character. I could in principle discuss some evidences of this love, even though it will be difficult to convey the full grounds of my own beliefs. Similarly, Stenmark argues that a religious believer may discuss the evidence for God's existence, though the grounds for religious belief are broader.¹⁸⁶ So, if the reasons for belief discussed by Swinburne and other theistic philosophers (or the Intelligent Design movement) are at all relevant or interesting from the believer's standpoint, then their evidential value can be discussed fruitfully, even if religious belief itself is based on broader grounds.¹⁸⁷ Indeed, Olli-Pekka Vainio has demonstrated that historically even most of those who classified as fideists have wanted to find some sort of connections between Christianity and the broader culture.¹⁸⁸

As I argued in chapter 2.3 normative statements about the relationship of theology and science can be difficult to argue in a way that will convince everyone, since there are many

¹⁸⁴ Swinburne 2004b.

¹⁸⁵ McGrath 2003, chapter 14.

¹⁸⁶ Stenmark 1995, 325-327.

¹⁸⁷ Stenmark's parable succeeds in describing how natural theology might be possible without presupposing that religious faith in God is merely a hypothesis. It also depicts well the desire for dialogue and apologetics that is important for natural theology. However, the parable is incomplete because natural theology is not just theoretical dialogue to convince others of the truth of some proposition. Rather, it is also the theoretical exploration and systematisation of intuitions about the world and meditation before the mysteries of creation. McGrath (2008, chapter 11), for example, emphasizes natural theology's links to the theology of beauty and awe.

¹⁸⁸ Vainio 2010.

different religions and sciences. If one adopts a non-realistic view of religious language, then the arguments of natural theology will appear to be completely uninteresting. However, if one adopts the theological realism of theologians like McGrath, then the prospects for dialogue begin to look more promising.¹⁸⁹ Historically religions have themselves been formulated in dialogue with other traditions, and communicating religious truths has historically been seen as a valuable objective. So, for many forms of religious belief, finding commonalities in rationality and ideas between different traditions can be seen as valuable.¹⁹⁰

The Critique of Idolatry

The second theological critique of natural theology relevant to the ID discussion is the critique of idolatry. There is often argued to be a large difference between the “God of the philosophers” and the God of Christianity. For example, the mathematician Blaise Pascal (1623-1662) described his mystical experience in 1654 as follows: *“From about half past ten in the evening until half past midnight. FIRE. God of Abraham, God of Isaac, God of Jacob, not of philosophers and scholars. Certainty, certainty, heartfelt, joy, peace.”* For Pascal this did not mean the rejection of philosophical apologetics, but he did think that the arguments of natural theology are insufficient for real religious belief.¹⁹¹ However, others have used this difference to argue that all images of God constructed on the basis of human reasoning are idols. Though the main current of Christian belief has always accepted dialogue with philosophy, critique of philosophical ideas has also been commonplace in theology.

The critique of idolatry springs from two very different sources. The first is Barth’s argument that Christian theology and belief should be based on revelation, rather than fallen human reasoning, which will inevitably end up constructing an idol. Only the revelation of God can bring knowledge of God. Barth’s famous “Nein!” (1934) to natural theology was written in response to his friend Emil Brunner’s (1889-1969) moderate defence of natural theology. Brunner had argued that some sort of human capacity for the reception of revelation and remnant of the image of God is required by Christian doctrine and tradition.¹⁹²

The second source for this critique of natural theology as idolatry is quite different: Martin Heidegger’s (1889-1976) philosophical critique of “onto-theology”.¹⁹³ The critique of onto-theology is that using God as an explanation inevitably makes God into just another creature among creatures, part of the system of the world. In order to say that “God exists”,

¹⁸⁹ E.g. McGrath 2001.

¹⁹⁰ Vainio 2010, McGrath 2003, 110-117.

¹⁹¹ Adamson 1995, chapter 7.

¹⁹² McGrath 2008, chapter 7; 2001, chapter 6; Barr 1993; White 2010; Holder 2012. The critique of natural theologies based on fallen human reason is also important in Luther’s critique of the “theologians of glory” who construct an image of God in which the cross of Christ has no place (Kopperi 1997, 138n53).

¹⁹³ McCord Adams 2014.

for example, one has to assume some sort of common concept of existence shared by both God and created being. Theologian Conor Cunningham has applied this critique to ID by arguing that speaking of God as a designer makes God into a watchmaker comparable with a human being. Cunningham thus argues that ID's designer is actually closer to a devil than the true Creator, because the designer is just like a human being, only more powerful and more intelligent.¹⁹⁴ Though the concept of onto-theology was popularized by Heidegger, the idea that God is very different from any creature is nevertheless a staple of classical Christian theology. In the theology of Aquinas, for example, God is not just a normal being among beings, but "being itself." Any application of terms to God is analogical, not direct.¹⁹⁵

Responding to the Critique of Idolatry

In my view, though the danger of creating a false image of God is always present in theology, the critique of idolatry is not a good argument against all natural theology. The Barthian critique of natural theology has an inner tension, because the Bible and Christian theology themselves seem to contain grounds for natural theology. In this situation, the Barthian reliance on the Bible should lead to the acceptance of some sort of natural revelation.¹⁹⁶ McGrath's theology of nature accepts the basic Barthian suspicion of human reason, though McGrath argues that Barth states the matter too extremely. Theologies of nature solve the tension by allowing for resonance between Christian doctrine and human reason, but arguing that nature must always be interpreted from the Christian viewpoint before it can be seen to reveal the divine Logos. Rather than neglecting Christ, creation is understood to happen through the same divine Logos who then becomes incarnate to redeem mankind. The Christian tradition itself is seen as warranting this kind of resonance between general knowledge and revelation, thus negating the Barthian objection.¹⁹⁷

But will a natural theology of the Swinburnean type, starting from commonly shared premises, necessarily end up constructing a God of the philosophers with nothing in common with the Trinitarian God? It is important to note that the question of fitting together different images of God is not just a problem for natural theology, but all of Christian theology. The God of the Old Testament is not openly Trinitarian, though the Old Testament can be interpreted from the viewpoint of Trinitarian theology. Within Christian theology the Prophets of the Old Testament are thought to speak of the same God as the New Testament.¹⁹⁸ So, could not philosophical natural theology also speak of the same God, even

¹⁹⁴ Cunningham 2010, 275-280.

¹⁹⁵ See also Turner 2004. Turner also defend's the possibility of natural theology based on his understanding of Aquinas.

¹⁹⁶ E.g. McGrath 2008; Barr 1993.

¹⁹⁷ McGrath 2001, chapter 6. McGrath himself terms his though a "natural theology", but as Runehov (2010) argues, its content is closer to what is usually meant by a theology of nature.

¹⁹⁸ On the historical importance of the Old Testament for Christianity, see Pelikan 1971, 13-27.

if it does not speak always in the same terms? The two understandings of God are not wholly different: Proof texts for most of the attributes of the theistic God (such as omnipotence, omnipresence, omniscience, moral perfection and so on) can also be found in the Bible.¹⁹⁹ Thomas Aquinas described the relationship of the God of the philosophers through an interesting metaphor. If we see someone from far away, we may be able to tell that it is a human person, and only later recognize that it is Peter. When seeing the person far away, we were seeing Peter, even while we did not recognize him. Similarly, the God of the philosophers can be interpreted to be, on closer inspection, the God of Abraham, Isaac and Jacob who is known more fully through faith.²⁰⁰

The question of ontotheology requires thinking about the nature of theological language. In what sense can human concepts be applied to God at all? The question is not just about concepts like “being” or “design” but also applies to concepts like the love of God and the properties of God discussed in various Biblical passages. Because we are human beings, we must necessarily use human concepts when talking about God. Theologian Denys Turner has defended natural theology against the critique of onto-theology in his book *Faith, Reason and the Existence of God* (2004). Turner argues that we must simultaneously recognize both God’s unknowability and his knowability. Theological language balances between affirmation and negations, and forgetting either leads to problems. Claiming that God is wholly other and that human concepts cannot be applied to him would make God irrelevant to humans and dismiss the central Christian doctrines of God’s revelation and incarnation. However, believing that we can wholly comprehend God would lead to creating a false image of God to fit into our philosophies. This would indeed lead to constructing an idol as feared by the ontotheologians, because Christian doctrine also requires admitting the transcendence and mysteriousness of God’s nature.

Turner argues that natural theology can be formulated in a way that avoids the ontotheological error. The key is that in proving the existence of God (or at least providing evidence supporting this belief) natural theology is proving the existence of a mystery that reason cannot fully grasp. Paradoxically, just as natural theology leads us to understand that God exists and that God has certain attributes, it also leads us to understand God’s transcendence and mysteriousness.²⁰¹ The same point is poetically expressed by Augustine, as quoted previously: *“though the voices of the prophets were silent, the world itself, by its well-ordered changes and movements, and by the fair appearance of all visible things, bears a testimony of*

¹⁹⁹ For example, see the articles in Flint & Rea 2009, which discuss the attributes of God and often quote biblical passages alongside philosophical reflection.

²⁰⁰ Turner 2004, 18-19.

²⁰¹ This is the central argument of Turner 2004. Turner is a representative of the tradition of negative theology, and all proponents of natural theology do not accept as strong a sense of the mysteriousness of God. As William Alston has pointed out in his article “Two Cheers for Mystery” (2005), modern Anglo-American philosophical theologians generally trust in the capacity of the human reason to understand quite a lot of the properties and intents of God, though no-one believes that they fully comprehend God. For two different perspectives of how we can talk of God’s “properties”, see also Holmes 2007 and Wainwright 2009. Dawes (2009, 46-48) argues that the analogical nature of theological language harms the explanatory power of the arguments of natural theology.

its own, both that it has been created, and also that it could not have been created save by God, whose greatness and beauty are unutterable and invisible."²⁰²

Edward Feser's statement of the theological problems of speaking of God as a designer is more positive to ID than Cunningham. Feser separates between five different gradations in our conceptions of God. On the first level (1), God is understood as a wizard-like bearded man who lives in a place called Heaven. On the second level (2), God is understood as an omnipotent and omniscient bodiless being who is nevertheless comparable to a human being. On the third level (3), God is understood as pure being or existence itself, as in the tradition of philosophical theology. The fourth level (4) is based on mystical experience of God, and is the highest achievable in this life. The fifth level (5) is the beatific vision of God. In Feser's view, ID is on the second level of understanding of God, and thus presents an anthropomorphic conception of God. Feser criticizes ID's idea of God as a designer, arguing that we should move towards a deeper understanding of God. However, an interesting part of his analysis is that he does not condemn any of the levels as somehow evil. On all levels, theological language does manage to speak about God. Children may even need to begin with the first level of understanding before proceeding further. Each level is an improvement over the previous one, and closer to the truth than atheism. According to this understanding, then, ID thus also manages to communicate something about God.²⁰³

The ID theorists do recognize that God is more than a designer. As I will argue in chapter 3.1, the Intelligent Design movement by and large insists that the design argument does not prove the existence of God. However, if God is not more than a designer, then establishing the existence of a designer would already be sufficient to establish the existence of God. Therefore, the ID theorists' must be claiming that God is more than a designer. Often this implied conclusion is also stated directly.²⁰⁴ This is in line with Turner's description of theological language: our language fails not because it says too much of God, but because it says too little. In the Thomistic account, God can be talked about analogically. Thus God can be said to be personal, loving and wise like humans, but in a different way than humans. Analogy always includes both a denial and an affirmation. Similarly, it seems that God could be said to be a designer, but in a different way than humans.²⁰⁵

There is some disagreement about whether we can specify exactly in what way the terms used of God differ from terms used about human persons. In univocal accounts of

²⁰² *De civitate dei*, XI, 4.

²⁰³ Feser 2008, 87-88.

²⁰⁴ E.g. Behe 2000h.

²⁰⁵ Turner 2004, chapters 7 and 8. There is some disagreement about whether we can specify exactly in what way the terms used of God differ from terms used about human persons. In univocal accounts of theological language, it is argued that we can identify the core similarities and differences in the use of language, so that we can say precisely what we mean when we say that God is a person, for example. God is a person, but without a body and without the limitations of humans. It may be that this univocal account of theological language fits better with Intelligent Design's theories about the attributes of the designer. The univocal account of theological language also always includes both negation and affirmation, just as the analogical language. Both accounts are quite possible for Christians.

theological language, it is argued that we can identify the core similarities and differences in the use of language, so that we can say precisely what we mean when we say that God is a person, for example. God is a person, but without a body and without the limitations of humans. It may be that this univocal account of theological language fits better with ID's ideas about the attributes of the designer. Using univocal language, God could be understood as a designer in the sense that he too has intentions and is able to give matter rational form that fulfills some purpose. The univocal account of theological language also always includes both negation and affirmation, just as the analogical language. In both accounts, denials must be based on some affirmations that are also made. In order to have a basis for claiming that our theological language cannot exhaustively describe God, we must first have some positive understanding of what God is like.²⁰⁶

Intelligent Design and the Doctrine of Creation

As Cunningham argues in response to Intelligent Design, the doctrine of creation is about much more than the idea that God is the designer of the empirically studied order of nature. It is, according to Cunningham, primarily a metaphysical doctrine explaining why there is something rather than nothing, explaining the fundamental dependency of all things of their Creator.²⁰⁷ I think that Cunningham's point is important. ID does not speak of this aspect of the doctrine of creation, and thus provides at best an incomplete defence of belief in the doctrine. I will be returning to this critique in chapter eight.

However, it seems to me that ID does correctly call attention to another part of the doctrine of creation: God as the Creator of the order of the nature. In studies of the historical development of the doctrine of creation, it is often even argued that the idea of God as the conqueror of the forces of chaos and the creator of order in the cosmos preceded the doctrine of *creatio ex nihilo* and metaphysical developments of the doctrine. McGrath thus argues that "*the theme of ordering is of major importance to Old Testament conceptions of creation.*"²⁰⁸ The fact of existence is not the only thing explained by the doctrine of creation; it also seeks to explain the rationality and beauty of the world God has created. It is with this part of the doctrine of creation that ID's "designer" who purposefully creates order can find consonance.²⁰⁹

²⁰⁶ For one in-depth defence of univocal theological language, see Alston 1989. For further reflection on the matter, see also Williams 2005 and McCord Adams 2014.

²⁰⁷ Cunningham 2010.

²⁰⁸ McGrath 2001, 155. See also Copan & Craig 2004 for a defence of the view that the biblical text itself expresses the idea of *creatio ex nihilo*.

²⁰⁹ This is not to say that all versions of the doctrine of creation will be compatible with Intelligent Design. For example, from the standpoint of process theology, a creator ordering nature could be seen as coercion and contrary to love. Thomas Jay Oord (2010) indeed criticizes Intelligent Design on this basis. However, the creation of form could also be seen as a gift (Hart 2003).

Chris Doran (2010, 231-233) also argues that ID's designer cannot be the Christian God. This is because (1) in the ID literature, designers also act in an undetectable way, which ID thinkers sometimes call deceptive, (2) constrained optimization (one of ID's responses to the problem of evil) should not apply to an omnipotent God,

The ID theorists are not the only ones who have argued that finding signs of design in the cosmos resonates in some way with the Christian doctrine of creation. This is also assumed by the design arguments of mainstream natural theology. Above, I argued that responses to the charge of idolatry and ontotheology are available both within theologies of nature and natural theologies. All of these responses are also available for the ID movement. The compatibility of the vague “intelligent designer” and the God of the Bible can be defended using the same logic as the identification of the “God of philosophers” with the God of Abraham, Isaac and Jacob in natural theology. Intelligent Design also does not need to argue that knowledge of God needs to be gained from some sort of neutral standpoint. Evidence of design in the cosmos could simply be way of finding resonance with a pre-existing Christian belief.²¹⁰ So, evading these theological critiques seems possible for ID.

This does not mean that no other theological critiques of ID can be made; I will consider several critiques in the coming chapters. Furthermore, the critiques of natural theology remain practically useful, because they can help natural theologians and ID theorists formulate their enterprise in a way that avoids theological dangers.

In this background chapter, I have introduced several themes important for my analysis of Intelligent Design. I began by exploring the relationship of Intelligent Design and different forms of creationism as well as theistic and naturalistic evolutionism. I then I introduced the dialogue between theology and the natural sciences, as well as the tradition of natural theology. I then briefly argued for some positions, such as the rejection of scientism and the possibility of some sort of moderate natural theology or theology of nature. My openness to the science-religion dialogue and natural theology together with my wish to avoid the dangers pointed out in the above discussion also leads me to a critical openness towards design arguments. I have moved “beyond fideism” to a broader conception of religious rationality.²¹¹

Another factor contributing to my interest in the ID debate is my own subjective experience of the feeling of wonder and amazement at the order of nature which underlies design arguments. As I will over the next two chapters, both critics and defenders of design

and (3) harmonising ID with theism requires further theological reasoning, which ID argues is unnecessary for the design argument. In my view, all of these points are misunderstandings of ID. The first point, the undetectability of at least some divine action, is in any case part of the traditional Christian picture. Regarding the second point, I will argue in chapter 9.2 that this is more properly related to the critique of the possibility of a world that is the best in all conceivable respects. Regarding the third point, I will show in chapters 3 and 9 that the ID theorists actually do allow for using additional theological arguments when analysing issues like the character of the designer and the problem of natural evil.

²¹⁰ Sometimes talk of God as a designer does seem to become a primary way of understanding who God is within ID literature. In a popular defence of the Christian faith, Dembski uses the word “designer” instead of the word “God”, speaking of the Designer’s transcendence and goodness and his visit to Earth in Jesus of Nazareth. (Licona & Dembski 2010, 12) Here Cunningham’s critique is perhaps an appropriate reminder of the limitedness of the analogy of God as a designer. However, Dembski does elsewhere use more classical concepts, such as describing Christ as the Logos of God, in describing the relationship of the design argument to Christian theology. (Dembski 1999a)

²¹¹ Vainio 2010.

arguments share an intuitive feeling that the order of nature bears the appearance of design, and that this must somehow be explained. But is this intuition reliable, and can it be rational to believe that nature indeed testifies of the existence, power and wisdom of its Creator? What is the structure of the design argument, and can it avoid the standard philosophical critiques of natural theology? Are the natural sciences somehow relevant to answering this question, or can it be answered even without considering scientific results and methods? I will consider ID's relationship to natural theology and the natural sciences in more detail in chapter 3.

3. DESIGN, NATURAL THEOLOGY AND SCIENCE

How should we situate Intelligent Design in the theology and science discussion? Intelligent Design has both commonalities and differences with the tradition of natural theology. Both emphasize the relevance of evidence for religious belief and argue that a personal being is the explanation for some features of nature. The design argument is also used in natural theology, though it takes a somewhat different form in the ID movement's argumentation. But whereas natural theology is a part of the philosophy of religion, Intelligent Design makes a claim to being a scientific research programme rather than a philosophical argument. In this chapter, I explore the relation of ID to natural theology and the natural sciences. In the process, I also lay some groundwork for my analysis of ID's design argument in the following chapters. Chapters 3.1, 3.2, and 3.3. explore ID's overall vision and its relationship to natural theology; chapters 3.4 and 3.5. explore ID's relationship to science.

3.1. The Separation between the Designer and God

Traditional Understandings of the Design Argument

Design arguments "*focus upon finding and identifying various traces of the operation of a mind in nature's temporal and physical structures, behaviors and paths.*"²¹² The argument is also called the teleological argument, because it is based on apparently goal-directed (teleological) order in nature. Design arguments are *a posteriori* arguments based on the empirically discovered properties of nature, rather than *a priori* arguments based just on reasoning from first premises. Design arguments have historically been among the most popular and most widely believed of natural theology's arguments in support of belief in the existence of God. Even Immanuel Kant, critical of all proofs of the existence of God, wrote that the teleological argument

always deserves to be mentioned with respect. It is the oldest, the clearest, and the most accordant with the common reason of mankind. It enlivens the study of nature, just as it itself derives its existence and gains ever new vigor from that source. – Reason, constantly upheld by this ever-increasing evidence which, though empirical, is yet so powerful, cannot be so depressed through doubts suggested by subtle and abstruse speculation, that it is not at once aroused from the indecision of all melancholy reflection, as from a dream, by one glance at the wonders of nature and the majesty of the universe – ascending from height to height up to the all-highest.²¹³

²¹² Ratzsch 2010.

²¹³ Kant 1953, 520; quoted in Plantinga 1990 [1967], 95.

Kant did also criticize the design argument. He argued that the argument can provide evidence only for the existence of some kind of designer, not the existence of God. The crucial problem is the finiteness of the universe, which can be explained by supposing the existence of a very wise and very powerful being, without the need for an infinite Creator.²¹⁴ Kant further argued that using speculative reason to establish the existence of God is an error, because God is not spatio-temporal and cannot be the object of experience.²¹⁵

Modern natural theology and Intelligent Design diverge significantly in their responses to these critiques. Modern natural theologians have disagreed with Kant's epistemological ideas and his conclusion. According to Swinburne, an infinite Creator is a simpler hypothesis than a finite Creator, and the cumulative theistic argument can give us good reasons to believe in an infinite God, even if they do not prove his existence absolutely. Whereas Kant assumed that our conclusions cannot exceed that which is required by the evidence, even theories within natural science go beyond this requirement. For example, on the basis of observation of a small part of the cosmos, we make theories about physics which concern the whole universe.²¹⁶ The ID movement agrees that the designer can be identified as God using additional theological and philosophical argument. However, the movement also emphasizes, with Kant, that design arguments alone can at most prove the existence of an unidentified designer.²¹⁷

Intelligent Design's Minimalistic Design Argument

The ID theorists explicitly refer to the philosophical discussion on design arguments as motivation for their limitation of the design argument. Michael Behe admits that God is culturally the obvious candidate for the role of the designer, but nevertheless "*the leap [from a designer] to God with a capital G short-circuits scholarly arguments that have been going on for millennia across many cultures.*"²¹⁸ In the context of this quote, Behe supports this idea with the possibility that the order of nature could in principle be the product of some highly advanced technology, rather than the creation of God. The design argument by itself is not

²¹⁴ Kant 1953, 520.

²¹⁵ Rossi 2014.

²¹⁶ Swinburne 2011b. See also Tapio Luoma's analysis of Thomas F. Torrance on this point (Luoma 2002, chapter 5).

²¹⁷ Sometimes the movement's thinkers emphasize this so much that some critics even interpret them as agnostics. (E.g. Nieminen, Mustonen & Ryökäs 2014, 277: "These ID proponents [Behe as the prime example] seem to have mostly agnostic worldviews.") This is a misunderstanding that is corrected by a broader reading of the ID literature, as I will show in the main text.

²¹⁸ Behe 2007, 277-288. See also Behe 2001a, 699-700. Even in some defenses of natural theology, the selection of theism over other designer-alternatives can also be based on subjective personal and cultural reasons. For example, James F. Sennett (2005) argues that because of our cultural context and our background beliefs, then evidence for the existence of some mind which has ordered the cosmos is for most Western people quite reasonably also evidence for the Christian God rather than Hume's spider-god or a polytheistic pantheon of gods.

enough to adjudicate between this idea and the doctrine of creation. Thus the design argument itself does not prove God. Willaim Dembski similarly argues that while ID is compatible with theism and creationism, it is also compatible with deistic views and Platonism, for example. Thus it does not “*prejudge such questions as who is the designer*”.²¹⁹

In some early ID works, the separation between the designer and God is not made this sharply. Phillip Johnson argues in his early book *Darwin on Trial* that believing in God as the designer of life is a reasonable alternative to Darwinism. Johnson's critique of methodological naturalism is based on the idea that supernatural explanations should be allowed within natural science.²²⁰ However, later Johnson has also defined the limits of the ID movement's argument more minimalistically: “*My personal view is that I identify the designer of life with the God of the Bible, although intelligent design theory as such does not entail that.*”²²¹ Similarly, in an early article Stephen Meyer argues that intelligent design is part of the “*return of the God hypothesis*”. Citing the arguments of natural theology favorably, Meyer argues that many lines of evidence provide epistemic support for belief in God, though they do not prove his existence.²²² However, in his later writings Meyer has also emphasized the distinction between the intelligent designer and God: “*neither the evidence from biology nor the theory of intelligent design*”²²³ can prove the identity of the designer as God. Nevertheless, he continues to hold that “*theism makes more sense of the totality of human experience than does any other worldview.*”²²⁴

All of the major ID theorists make a connection between the designer and the Christian God, and regard making this connection as a very reasonable thing to do. For example, Dembski argues that Intelligent Design forms a “*bridge between science and theology*”²²⁵ and that “*ultimately, the problem is whether reality at its base is purposive and intelligent or mindless and material.*”²²⁶ According to Johnson, materialists reasonably fear that “*even the most minimalist version of a deity will tend to become understood as something like the God of the Bible, who communicates with humans and cares about how we behave.*”²²⁷ He thus sees Intelligent Design as a “*wedge*” which will open up an open discussion about the nature of the ultimate reality and make it easier to trust in the God of the Bible.²²⁸ According to Behe, evidence for design has the effect of strengthening a believer's faith in God²²⁹, and philosophical, historical and religious arguments exist which support seeing the designer as the God of

²¹⁹ Dembski 1999a, 252.

²²⁰ Johnson 1993.

²²¹ Johnson 2007.

²²² Meyer 1999c.

²²³ Meyer 2010, 439.

²²⁴ Meyer 2010, 440.

²²⁵ Dembski 1999. The traditionality of Dembski's belief in God can also be seen from his critique of process theology in the introduction to Dembski, W. Downes, J. and Frederick, W. (ed) 2008. On process theology, see further McDaniel & Bowman 2006, Cobb & Griffin 1976, Nash 1987.

²²⁶ Wiker 2002, 11.

²²⁷ Johnson 2007.

²²⁸ Johnson 2000.

²²⁹ Behe 1998a.

Christianity. Behe even makes the same argument that Russell and Sober made after him: an infinite series of designers is implausible, and so God is the most plausible designer.²³⁰ Meyer and Dembski have argued together that evidence of an intelligent designer constitutes evidence for Christian theism when compared to atheism, even if design is also compatible with other non-naturalistic views.²³¹ So, the beliefs of the ID theorists and the natural theologians on the identification of the designer and God are quite close, though the practical rhetorical strategies are very different.

Given these views, it seems perplexing that the ID theorists so often emphasize the distinction between the designer and God, rather than the connection between the designer and God, which they clearly also make. Some critics of the ID movement have argued that the separation between the intelligent designer and God is merely a strategic ploy for the ID movement. By saying that ID does not reveal the identity of the designer, the design argument keeps the appearance of non-religiosity and can be taught in public schools in the U.S.²³² Elliott Sober (representing naturalism) and Robert Russell (representing theistic evolutionism) have argued separately that not identifying ID's designer as God is very difficult. Identifying the designer as space aliens, for example, leads to the additional question: where did these space aliens come from? If evolution is not a viable answer, then these space aliens must themselves have also been designed. If we do not want to end up with an infinite series of designers, then at some point the chain must stop with God. So, the designer is most credibly God.²³³

As persuasive as this line of thought can be, Russell and Sober don't represent these arguments as absolutely unassailable. The arguments from Kant and Hume for a distinction between the designer and God are still accepted by many philosophers and theologians. It could be that the ID theorists simply agree with Kant and Hume on this issue. Their language in the above quotations supports this possibility. It is argued that the mere idea that there is an intelligent designer of life is compatible with several ideas of what the designer is like, and it takes further argument to rule out space aliens. Given the strong traditions behind the separation of the designer and God, it seems plausible that the ID theorists seriously believe that it takes an extra step of reasoning to move from "there is a designer" to "this designer is God." Even if they themselves think that taking this extra step is very reasonable, they can without contradiction think that this additional step does exist.

Once again, I think the truth lies somewhere in the middle of ID's position and the critics' argument. The ID theorists' formulation of the logic of the design argument, which I will analyse in more detail in chapter 4, does support the possibility of a separation between the minimalistic hypothesis of design and God. So, the ID theorists have grounds to honestly believe in this distinction. However, the best explanation for the ID theorists' emphasis on this distinction is created by the unique cultural situation of the ID movement and its desire

²³⁰ Behe 2001.

²³¹ Dembski & Meyer 1998.

²³² Shanks 2004, Forrest 2001. For a critique of Shanks, see Del Ratzsch (2005).

²³³ Russell 2005, Sober 2007.

to break out of the intellectual ghetto of creationism, and to gain a foothold in science education. So, the emphasis is made for strategic reasons, even if the distinction is honestly believed.

It is easy to imagine that the ID theorists' emphasis would be quite different, if the cultural circumstances were different. In the debate on ID, defenders of the design argument emphasize the difference between the designer and God, while critics emphasize the supernatural nature of the designer. This is a complete reversion of the debate between Hume and Paley. Suppose that there was no pressure to get ID qualified as a part of natural science, and the central cultural issue was instead the credibility of theism. With this change, theistic defenders of Intelligent Design would likely emphasize the connection they see between the designer and God, while the atheistic critics of the movement would once again argue that the design argument can establish only the existence of some designer, but not God.²³⁴ Indeed, I will argue later that though the minimalistic conception of the designer does make some sense based on the logic of ID's design argument, ID's broader cultural agenda requires a more robust concept of the designer. In many cases, the ID theorists move between a minimalistic and theistic conception of the designer as it suits their purposes.

3.2. Understanding Teleology

In design arguments, certain properties of the order of nature are thought to be best explained by reference to the intentional operation of a mind: an intelligent designer. One common feature of nature which has been seen as designed is teleology, goal-oriented order. Members of the Intelligent Design movement see explaining this type of purposive order by reference to the purposes of a designer as a very reasonable thing to do. However, others deny that there is any essential link between teleology and intelligent design, arguing that teleology (or at least the appearance of teleology) can also exist without purposeful design. I will now introduce the foundational concept of teleology.

The Shifting Fortunes of Teleology

Teleological conceptions of nature go back to the early Greek philosophers, most prominently to Plato and Aristotle. Plato argued that the random movement of matter itself is not sufficient to generate the orderliness of the world. Rather, the teleological order of the

²³⁴ William Lane Craig (2008) indeed uses the ID movement's design argument as part of an apologetic for Christian theism, arguing that the existence of an "intelligent designer" fits better with theism than atheism. According to Craig, it would be strange for a naturalist to argue that they believe in the existence of a very powerful, wise creator of life and the cosmos, but that they do not believe in God. The existence of Zeus would indeed already be a problem for many forms of naturalism, though perhaps not for all - such gods could perhaps be explained as products of naturalistic evolution as well.

material world was created by a *demiurge* acting as a mediator between the material world and the eternal world of ideas. Plato's conception of teleology can be characterized as extrinsic: purposeful order is imposed on the world from the outside.²³⁵ In contrast, Aristotle's conception of teleology is immanent. Aristotle rejected Plato's world of ideas and thought that teleology resides in the order of nature and individual creatures themselves. The four fundamental causes were the material cause (what a thing is made of), the efficient cause (what creates the thing), the formal cause (the form which the matter takes), and the teleological cause (what a thing is directed towards or what it exists for). For Aristotelians, teleology is present everywhere in nature, not just in biological organisms. For example, the Moon is directed towards moving around the Earth. It is not that the Moon is a conscious creature: for Aristotelians, teleology does not have to be conscious.²³⁶

Aquinas' teleological argument is a synthesis of the Platonic and Aristotelian concepts of teleology: teleology is immanent to the order of nature, but has an extrinsic origin. Aquinas argues that the unconscious natural teleology of the world requires the intentionality of an intelligent being who directed all things to their natural ends. As an arrow reaches its target because it is directed by an archer, so what lacks intelligence in nature achieves its goals because of the direction God gives it. Teleology resides in each individual creature, but it is planted there by God.²³⁷

These Platonic, Aristotelian and Aquinian conceptions of teleology are all forms of teleological realism. Teleology is understood to be an objectively real part of the world, indispensable for our understanding of reality. The beginning of teleological nonrealism can be found in the scientific revolution and the removal of teleological explanations from physics. Early modern scientists such as Francis Bacon and Descartes preferred a scientific picture that did not refer to teleology, but explained things by reference to matter in motion. Teleology was not completely abolished, however, but retained a place outside scientific discourse. Descartes situated teleology in the conscious life of the subject, while other mechanistic philosophers argued that matter in motion requires a divine designer to order it into the harmonious cosmos we observe.²³⁸

While teleological language fell from favour in physics, it nevertheless remained indispensable in biology. Even though organisms are natural entities, it has proven difficult to understand these self-organising, self-nourishing entities without reference to teleology (or at least something very much like teleology). The purpose of the heart seems to be to pump blood, the purpose of lungs seems to be to breath air, and so on. All of the organs function together to keep the animal alive.²³⁹ Many see teleology as the wrong term for this functional complexity and instead wish to talk about adaptations, functional complexity or teleonomy, but these are arguably merely new names for teleology. Aristotle himself did not

²³⁵ Ariew 2002, 8. Sedley 2007, Cornford 1977, 32.

²³⁶ Ariew 2002, 8. Sedley 2007, Cornford 1977, 32.

²³⁷ Feser 2008.

²³⁸ Ariew 2007.

²³⁹ Walsh 2008.

argue that teleology has to be purposeful or conscious, so the desire to avoid talk of conscious purposiveness does not require abandoning the term.²⁴⁰ As I will show in chapter 6, the ID theorists themselves also write of things like biological functions, machinery and information, and then interpret these as products of purposeful design.

The question of how biological teleology should be understood within a naturalistic understanding of reality has perplexed philosophers, and many solutions have been attempted. Two possible solutions are teleological eliminativism and teleological reductionism. In teleological eliminativism, teleology is understood to be merely a human concept, not an objective property of nature. Biology is understood to be in the business of ultimately providing non-teleological descriptions of organisms. In teleological reductionism, the reality of teleology in nature is affirmed, but it is believed to emerge from ultimately non-teleological processes.²⁴¹ There is a broad spectrum of naturalistic views, ranging from reductionistic views, rejecting the reality of teleology even in the context of human actions, to more robust views affirming the reality of natural teleology and human consciousness.²⁴²

One strategy the ID movement could adopt in defending belief in a Creator would be to argue that teleology in nature is real and that naturalism is conceptually unable to account for it. This strategy is taken up by thinkers like Michael C. Rea in his book *World Without Design* (2005) and Edward Feser in his *The Last Superstition* (2008). Conor Cunningham also argues that the most consistent form of materialism is eliminative materialism, which denies the reality of everything that is difficult to account for in terms used in physics, such as the reality of consciousness and teleology. However, this eliminative materialism is self-refuting and unlivable, and so is a very poor alternative to theism.²⁴³ A naturalist who agrees that eliminative materialism is absurd will typically often rather become a softer type of naturalist than convert to theism, however.²⁴⁴

Such philosophical arguments are not typically used in the Intelligent Design movement's critique of naturalism. Though the ID theorists refer to the classical discussions on teleology, they do not really engage with it in their literature or use classical concepts in arguing their case. They argue based on the appearance of purposefulness, rather than assuming the reality of purposiveness at the outset. They then claim that the best explanation for this appearance is that the order is designed, rather than being just a figment of human imagination. Their conception of purposeful order in biology does approach Aquinas' understanding, where teleology is seen as immanent to the organisms, but having an extrinsic source.²⁴⁵ However, while they are clearly teleological realists, they state their case

²⁴⁰ E.g. Walsh 2008, Melander 1997, Ariew 2002.

²⁴¹ Walsh 2008.

²⁴² Feser 2010. Melander (1997) presents four different models for understanding the justification of teleological descriptions in biology and argues for the possibility of teleological descriptions without supposing a designer.

²⁴³ Cunningham 2010.

²⁴⁴ See e.g. Walsh 2008.

²⁴⁵ Thus Ariew 2002, 8.

very differently from classical philosophers and Aquinas.²⁴⁶ Whereas St. Thomas' argument was metaphysical and deductive, the Intelligent Design movement's argument is better described as inference to the best explanation using empirical data and comparing the efficacy of naturalistic and design-based explanations.²⁴⁷

Explaining Teleology

Explanation by reference to the operation of an intelligent designer is not the only option that has been proposed as an explanation for teleology, or what Ratzsch terms mind correlativity: the correspondence of patterns in nature with the rationality of the human mind. The three most common options have been that (1) something mindlike, but not personal, has created nature in an orderly way, (2) nature has been deliberately designed to be rational by a personal Creator, or (3) our cognition sees nature as rational, but it is really not: there is nothing mindlike behind nature.²⁴⁸

Whereas the first two explanations are forms of teleological realism, the last one exemplifies teleological anti-realism. An influential formulation of the problem was given by Kant, who argued that "*our intellect does not draw its laws from nature – – but imposes them on nature.*"²⁴⁹ Teleology is seen by human minds, so what guarantees that teleology is real and not just a figment of the human imagination? The ID theorists argue that these rational patterns in nature are not created by this human act of interpretation, but are rather only discovered by humans. This is stated succinctly by Dembski: "*Intelligent Design is one intelligence determining what another intelligence has done.*"²⁵⁰ Again, this underscores the idea of a link between the sort of order seen in nature and intelligence. There is a rationality in nature which is comprehensible to the human mind. According to this idea, we can discover

²⁴⁶ Feser 2010.

²⁴⁷ There has been some controversy over how Intelligent Design is related to the classic Thomistic understanding of teleology. In their descriptions of biological nature, ID theorists sometimes seem to be moving within the modern mechanistic understanding of nature that is so popular within natural science, rather than understanding reality from the starting point of Thomistic philosophy. Philosopher Edward Feser, in particular, has pressed the point against ID (Feser 2008). Even J.T. Bridges, a Thomist very sympathetic to Intelligent Design, sees some tension here. However, Bridges argues that ID can be reconciled with Thomism, provided that ID is seen as a limited explanation on the scientific level, while Thomism is seen as a metaphysical worldview which can well accommodate mechanistic explanations within its framework. (Bridges 2012, 216). My own view is that ID's teleological realism is a significant point of contact with Thomism, but the Thomistic understanding of teleology is far broader than ID's. ID theorists base their design argument only on a part of nature's order (to be detailed in chapters 5 and 6), while Thomists see teleology everywhere.

²⁴⁸ I have adapted the list from Del Ratzsch (2001, 23). I have compressed his last three options into one, since they are all different explanations for why our minds would see nature as rational, even though it is really not. The explanation could be based on Darwinian evolution, the flexibility of our minds to find patterns anywhere, or perhaps our ability to impose the order of our minds on the outside world.

²⁴⁹ Popper 1964, 191.

²⁵⁰ Dembski 1998c, 19.

real patterns in nature and the rationality of nature is not just a human invention, but rather something merely discovered.²⁵¹

If we understand realism and anti-realism as different explanations for the appearance of “mind correlativity” or teleology in nature, then it becomes possible to use the evidence to speak in favour of the realistic interpretation of teleology. This explanatory comparison has been used in the same way to help show why we should prefer a critical realism in the natural sciences: it explains the success of the natural sciences better than the anti-realistic interpretation.²⁵² This was also Popper’s response to Kant. Our reason cannot impose any sort of laws on nature, at least if we suppose that nature really exists. In this case, a false understanding of the laws of nature will tend to be contradicted by actual events.²⁵³ Larry Wright has argued that teleological descriptions can be similarly tested and improved upon. For example, our understanding of how an automobile’s engine works can be falsified and improved with additional knowledge. The same is generally understood to be true in biology.²⁵⁴ It would be difficult to argue that the human heart acts as though it has the function of pumping blood even though it actually does not have this function in the context of the living organism. As Wright notes, this would amount to saying that the order of living beings is purely accidental.²⁵⁵ Wright’s rejection of chance as an explanation is quite similar to the arguments of the ID movement that as the complexity and specificity of a pattern increase, its explanation by reference to chance becomes ever less credible. Seeing a vague face of Elvis in peanut butter would not qualify as a real pattern, but would more likely be seen as accidental. But the words “I love you” formed by ink blots on the paper would be seen as a real pattern. Similarly, the complex patterns of functional biological order are clearly real.²⁵⁶

The possibility that some teleological descriptions are reliable does not mean that all teleological descriptions are equally useful or reliable. This also does not demonstrate that the way the ID movement understands teleology in biology is necessarily correct. In philosophy of biology, there seems to be a broad consensus that teleological-sounding descriptions are necessary for biology, though some prefer to use terms like “functional descriptions” or “teleonomy” to describe this. However, the nature of these teleological descriptions and their implications are not agreed upon.²⁵⁷

Teleological reductionism accepts the reality of teleology (or at least something like it) in nature, but argues that it is reducible to non-teleological causes such as process of evolution. Indeed, as Michael Ruse has argued, Darwinian evolutionary theory agrees with

²⁵¹ Menuge 2004b, Wiker & Witt 2006, Ratzsch 2001.

²⁵² McGrath 2002.

²⁵³ Pihlström 1997, 19.

²⁵⁴ Wright 1976, 149-150

²⁵⁵ Wright 1976.

²⁵⁶ This is related to Dembski’s concept of specified complexity, to be analysed in chapter 4.5. I note for clarity that Wright is not making a design argument. Rather, he allows for the explanation of teleology from both a design-perspective and a naturalistic evolutionary perspective.

²⁵⁷ Walsh 2008.

the tradition of natural theology that the functional complexity of biological organisms is a real thing to be explained. Otherwise there would have been no need for postulating the Darwinian mechanism of natural selection to explain such adaptations.²⁵⁸ The ID theorists have often referenced Dawkins' definition of biology as "*the study of complicated things that give the appearance of having been designed for a purpose.*"²⁵⁹ On this point ID and Darwinian evolutionary biology can be seen as allies. The difference is that rather than explaining this order by reference to the actions of a personal intelligent designer, evolutionary biology explains it as the product of natural evolutionary mechanisms. The idea is that teleology can ultimately be explained by non-teleological factors.²⁶⁰

3.3. Personal Explanation in Natural Theology and Intelligent Design

I have argued that ID attempts to explain the presence of teleological features of nature in terms of the operation of a mind. Precisely what sort of features is meant will become clear in chapters five and six. For now, there are even more fundamental questions to discuss: how do explanations by reference to the intentional activity of an agent work? Or do they have explanatory value at all? There is a vast history to this discussion.²⁶¹ This chapter will introduce the discussion on the validity of design arguments which will be continued in the following chapters. I will also note some commonalities and differences between ID and theistic natural theology.

Personal Explanation

In the contemporary discussion, the concept of personal explanation has received particular attention in relation to theistic natural theology. Because of the success of natural science, mechanistic explanations involving reference to law-like regularities are often considered to be the paradigm case of good explanations.²⁶² But there is another type of explanation that all humans are familiar with: personal explanation by reference to the purposes and capabilities of agents. The possibility that such explanations can have explanatory power is assumed in normal human life whenever we explain the activities of some human person by reference to their intentions. For example, we might say that our friend went to the shop because she wanted to buy milk, or we might say that an automobile has the order it has because it has

²⁵⁸ Ruse 2003. Thus also Dennett (2006b, 38) argues that design in nature is real and ingenious, but is explained by a process which acts without intelligence.

²⁵⁹ Dawkins 1991, 1. See chapters 2.2 and 4.1 of the present study for further discussion on ID's use of Dawkins.

²⁶⁰ Ruse 2003.

²⁶¹ Knuuttila & Sihvola 2014 for in-depth discussion.

²⁶² See Salmon 1990 for discussion.

been intentionally designed by humans. Similarly, theistic natural theologians argue that nature has certain features because its order has been intentionally designed by God.²⁶³

The ID movement does not always specify very exactly what is meant by design as an explanation, but the basic idea of personal explanation is clearly visible.²⁶⁴ Dembski makes the distinction between “design” which refers to just the pattern or structure which is observed and “intelligent design”, the activity of an intelligent agent which can create such a pattern. Dembski argues that the process of intelligent design typically proceeds in three steps. First, the designer has a purpose which he wants to execute. Second, the designer forms a plan to fulfill his purpose. Third, the designer arranges things according to his purpose.²⁶⁵ Other ID theorists argue that to create certain types of structures, the capability of an intelligent designer to arrange parts with foresight is required.²⁶⁶ Principally, the designer is capable of “*directed contingency*”, in other words “*choice*”.²⁶⁷ The designer thus has a will, the ability to plan, and the ability to influence the material world. The definition is based on human experience of design, just as the natural theologian’s defence of divine personal explanation is based on the efficacy of human personal explanation. The argument of the ID movement is that designers can create rational patterns in nature. Human designers can do this, and similar (but greater) capabilities are seen as the best explanation for nature’s order.²⁶⁸

Many objections to the use of personal explanations in natural theology and Intelligent Design thought have been made. At the most basic level, the coherence of the concept of God could be questioned. If the concept of God was somehow contradictory or incomprehensible, then explanations based on the activity of this divine person would not be explanations at all. Thus atheist Kai Nielsen, for example, has argued that the concept of God is so incomprehensible that it would not be reasonable to believe in God even if the stars were arranged before our eyes into the text “GOD EXISTS”, because this would have no more meaning than if the text said “PROCRASTINATION DRINKS MELANCHOLY.”²⁶⁹ ID is not committed to seeing the Creator as divine. However, if the concept of an unembodied intelligence is incoherent, this would be a problem for any form of Intelligent Design which implies that the designer is unembodied. In chapter 3.1, I argued that this is indeed how the ID theorists in practice understand the designer, so these arguments are also important for them.

In defending the coherence of theistic explanations, natural theology requires the help of philosophical theology. The discussion started by Swinburne’s *“The Coherence of Theism”*

²⁶³ E.g. Swinburne 2004.

²⁶⁴ Menuge 2004b.

²⁶⁵ Dembski 2002, xvi.

²⁶⁶ Behe 2006a, 193.

²⁶⁷ Dembski 2002, see also Dembski & Witt 2010. Dembski expands on his definition by writing that “[t]he principle characteristic of intelligent agency is directed contingency, or what we call choice.” (2002, 62)

²⁶⁸ I will be analyzing the logical structure of the argument in more detail in chapter 4.

²⁶⁹ Nielsen 2004, 279.

(1977) has convinced many of the coherence of theism and theistic explanation.²⁷⁰ A popular way of arguing for the coherence of theistic personal explanation is by reference to human personal explanations. According to Charles Taliaferro, if we regard explanations in terms of human intentions (such as “I wish to see my beloved”) as explanatory of human behaviour and logically coherent, then we will also have to concede that theistic personal explanation is also coherent and explanatory.²⁷¹ However, others continue to argue that the coherence of theism has not been demonstrated. The divine person is also often thought to be difficult to describe using the same concepts as human persons.²⁷²

Another simple way of rejecting theistic arguments would be to also reject the coherence and reliability of intentional explanations even in the case of humans. Eliminative naturalists, who believe that mind and intention are not real explanations even in the human context, will naturally also reject biological and cosmic design arguments. Within eliminative naturalism, references to intentionality in the case of humans are seen as “folk psychology” which should be replaced with correct scientific neurophysiological explanations for human behaviour.²⁷³ However, eliminative naturalism is a highly problematic view, which many theistic thinkers even regard as the *reductio ad absurdum* of naturalism, if it really is the most consistent naturalistic view of the world.²⁷⁴ In the discussion on ID, naturalists have typically not embraced eliminativism, but have accepted the validity of design-based explanations in the human context. Thus references to design and purpose are typically accepted to have explanatory power in the human context, but applying the inferences to the order of nature is criticized. This is a much more promising strategy than eliminative naturalism. However, it also allows that if design-based explanations used in biology are sufficiently similar to the explanations used in the case of human agents, then they could succeed.

Evaluating Design Arguments

The precise ways of criticizing ID’s design inference will become clear in the coming chapters, but a preliminary list of criteria – *testability, the amount of details, relation to background knowledge and past explanatory success* – will be helpful at this point to elucidate differences between personal explanations and mechanistic explanations. In the discussion surrounding ID, design-based explanations are typically evaluated using criteria developed in the philosophy of science to evaluate different scientific hypotheses. Science is held as the gold standard to which other explanations are compared.²⁷⁵ This strategy is not wholly misguided, since the ID theorists themselves present their design arguments as part of the

²⁷⁰ Swinburne 1993.

²⁷¹ Taliaferro 2012, 8-16; Taliaferro 1994.

²⁷² Dawes 2009, 48-51.

²⁷³ E.g. Churchland 2007.

²⁷⁴ E.g. Feser 2008, Goetz & Taliaferro 2008, Cunningham 2010, Menuge 2004b.

²⁷⁵ My list is based on criteria discussed by Ratzsch (2001, parts III and IV) and Dawes (2009, chapter 7).

natural sciences. Furthermore, there is surely much common ground between the evaluation of design as an explanation includes reference to criteria that are used in the natural sciences. Nevertheless, ID as a personal explanation also differs substantially from explanations that are typically used in the natural sciences.

The first commonly referred criterion of good explanations is the criterion of *testability*. In the natural sciences, the possibility to test different ideas against empirical results is highly valued, since otherwise we would be left with no way to find out if our theory is false. Theories can be tested by reference to their ability to explain current scientific knowledge, but also by their ability to predict future results. In some cases, predictions can be fairly easily inferred from the postulates of the theory. For example, knowing the laws of thermodynamics, we can predict that the amount of usable energy in a closed system will decrease over time. But often auxiliary hypotheses have to be added to the theory before we can derive predictions from it.²⁷⁶

Following the ideal of testability, it can be argued that personal explanations are also testable. For example, let's hypothesize that a person is going to the shop to buy milk. We can look at what the person does, and notice if the result actually occurs.²⁷⁷ Intentional explanations can also help be tested by comparison to other explanations, like the null hypothesis (random chance). Supposing that humans act for reasons provides a more plausible overall picture of human activity than the hypothesis that they act for no reason at all. Supposing that there exists a being with the appropriate intention and causal power to create some result, it can be argued that this hypothesis predicts the data better than the null hypothesis.²⁷⁸

However, typically, our theories about agents are not formed in this manner, by first hypothesizing about specific motives and then observing human behaviour. As Ratzsch notes, "*design theories are, ultimately, theories involving agency. And, with respect to agents, theories and explanations often must trail data. We are often in positions of utter inability to predict specific human actions, but such actions once observed may be readily and quite legitimately explainable.*"²⁷⁹ This is the case even in the case of humans. For example, we may be unable to predict why a person is going to the shop. Is it to buy milk, or to buy sugar? Or perhaps to flirt with the pretty clerk? We are often unable to tell beforehand. Often we even need information from the person in question before we can make the choice. Reasons for behaviour are often easier to identify after the fact, rather than beforehand.

In the case of ID, the motive of the designer is not thought to be part of the explanation. Rather, the capabilities of the designer to produce goal-directed order are the important explaining feature. The ID movement has also attempted to derive other predictions from the design hypothesis, as we will see in chapters 5 and 6. I will argue that this is moving between a minimalistic and a more robust design hypothesis. In principle it is indeed possible to add

²⁷⁶ Ratzsch 2001, chapter 7.

²⁷⁷ Dawes 2009, appendix.

²⁷⁸ Dawes 2009, 125.

²⁷⁹ Ratzsch 2001, 117.

auxiliary hypotheses to a minimalistic design argument to make the hypothesis more robust and generate more predictions. If the initial design argument is successful in identifying that there indeed exists an intelligent designer, it does not seem unreasonable to try to make additional hypotheses about any patterns that can be discerned in the designer's activity, just as extended observation of a human agent can lead us to create a more detailed theory about how that agent tends to act.²⁸⁰ So, as it keeps trailing the data, a design hypothesis can perhaps become more robust and thus also more testable, even if it is initially quite vague.²⁸¹

In chapter 4.4, I will be returning to the question of whether design hypotheses need to be predictive in order to be testable. In the influential hypothetico-deductive model of scientific explanation developed by Carl Hempel, explanation and prediction were synonymous. It was thought that each proper scientific explanation was also a prediction, because based on the relevant natural laws and conditions, one could predict the result. But in contemporary philosophy of science, the hypothetico-deductive model's strong link between predictive and explanatory capacity has been denied. Scientific explanation is more concerned with understanding the causal structure of the universe and explanatory unification, rather than just prediction. For example, quantum physics can explain even highly improbable quantum fluctuations, but may not ever be able to predict them.²⁸²

The *amount of details* provided about the designer is also relevant for analysing how good design is as an explanation. The goodness of God is a central explanatory factor in many theistic arguments. If we are able to comprehend God's goodness at least in some way, then it becomes possible to argue that a good God would have the motive to create a certain kind world. Thus Swinburne argues that God explains the order of the universe, because it is plausible to believe that his goodness would lead him to create bodily creatures capable of interacting with each other.²⁸³ Robin Collins argues that if we assume that the existence of complex, intelligent life is a good thing, then it becomes plausible to assume that a good God would create a cosmos which makes this existence possible.²⁸⁴ However, for many skeptics, the problem of evil makes ascribing such comprehensible goodness to God difficult.²⁸⁵ By contrast, the ID movement's designer is left unidentified and his motives are thus

²⁸⁰ Dawes 2009, 266.

²⁸¹ William Lane Craig (2007) has argued that although one cannot falsify the existence of a designer, particular forms of the design hypothesis can nevertheless be falsified and tested in this manner. It seems to me that this is correct. For example, one could falsify the hypothesis that the designer has created biological machines that are not evolvable through a gradual Darwinian process. Indeed, as we will see in chapter 6.3, many argue that natural science has indeed falsified this form of the design argument.

²⁸² See Salmon 1990, 117-122 and Woodward J. 2011 for the history of this discussion, as well as Woodward J. 2003 for discussion of the concept of causality. Cleland (2011, 568-569) argues that this can be seen even in the historical natural sciences. For example, the hypothesis that an asteroid impacted the Earth 65 million years ago arguably was not able to predict the precise geological discoveries that we have made, but is nevertheless regarded as the best explanation.

²⁸³ Swinburne 2004a, 346-349; 2004c.

²⁸⁴ Collins 2012, 254-256.

²⁸⁵ Narveson 2003. Similarly, Dawes (2009, 44-46) argues that a hypothesis about the motivations of the deity is extremely important for the explanatory value of theism.

mysterious. As I will argue in the coming chapters, the ID movement argues that certain types of patterns are better explained by an intelligent cause, even if the motives of this intelligent designer are unknown.²⁸⁶

Evaluations based on the amount of details provided by an explanation are also related to the concept of *scientific tractability*. Scientific explanations are highly detailed, with references to laws, mechanisms and the minutest details of the systems being investigated. Science also does not provide explanations for everything – for example, it is difficult to specify a mechanism explaining why gravity works the way it does. However, in general, an attempt is made for investigating natural phenomena in detail. By contrast, explanations by reference to intentionality do not include this level of mechanical detail. Theistic intentional explanations typically do not involve any specification about the mechanism by which God creates the laws of nature, for example. Indeed no such mechanism needs to be given, since according to the hypothesis God can bring about any result he chooses without any need for intermediate second causes. In the case of the intelligent design hypothesis, an intermediate cause does exist if the designer of life was a space-alien, as has been suggested. However, nothing like this has been specified by the Intelligent Design movement, and no evidence of laboratories or similar has been found on Earth.

Both theistic natural theology and Intelligent Design require that intentional activity as a cause itself possesses some explanatory power, even without specification of any particular mechanistic process the designer worked through. In intentional explanations as used in the human context, this does seem to be the case. In all explanations, there comes a point where we reach the level of basic causal powers, and are unable to specify further intermediate mechanisms.²⁸⁷ Furthermore, while intentional explanations seem to work on a different level than mechanistic explanations, this does not mean that they have no explanatory power.²⁸⁸ Like the natural theologians, ID theorist Meyer also references the example of human design as one basis for this claim. In the case of humans, we cannot yet specify how our consciousness and will influence the molecules of our bodies, but we nevertheless believe that our consciousness has an effect in the world, and that references to human design can be

²⁸⁶ This is a crucial difference between ID's design argument and the intentional explanations described by Dawes (2009, appendix). Within ID, the capabilities of the designer are thought to have explanatory power even apart from knowing the precise motives of the designer.

²⁸⁷ There is reason to think that the demand for intermediate mechanisms should not be absolute. Dawes (2009, 51-53) argues that the demand of an intermediate mechanism leads to an infinite regress. Suppose that we cannot say that A causes B without specifying an additional intermediate mechanism C. How can we then say that A causes C to cause B without specifying yet further causal mechanisms for how A causes C, leading to an infinite regress? Dawes thinks that divine action is a mysterious concept far removed from our everyday understanding, but the requirement for a mechanism is no reason to reject theistic explanations. At most it can be a reason for preferring naturalistic explanations when such are available.

²⁸⁸ Dawes 2009, appendix. These features lead Collins (2006) to suggest that Intelligent Design should be viewed as a "metascientific" idea: it has empirical content, yet operates on a different level than normal scientific theories. I will return to the question whether Intelligent Design is science in chapters 3.4 and 3.5.

explanatory. In addition, we can typically detect that something is designed by humans without being able to specify how these humans do so.²⁸⁹

This does show that design can be explanatory even without precise knowledge of mechanisms. However, in the case of human designers, we do typically have at least some idea of how the designed objects were produced (or how they could have been produced) in practice. The possibility to investigate such details further is a good thing for the hypothesis, though it is not unconceivable that a hypothesis could not have explanatory power even if further details about the cause cannot yet be investigated.²⁹⁰ If personal explanation is indeed explanatory, it is not necessarily a fatal flaw for it that personal explanations are different from mechanistic explanations. Even a vague hypothesis could in principle be the most plausible one, and could provide us with valuable knowledge. Following Aristotle, it could be argued that there may be great value in even a glimpse off "*celestial things*": "*half glimpse of persons we love is more delightful than an accurate view of other things.*"²⁹¹ But such glimpses are quite different from scientific theories.

Relation to background knowledge is another important criterion for evaluating explanations. How credible is the explanation beforehand and how well does it fit into our overall framework of beliefs? How likely is a given theistic hypothesis? I have already argued that our understanding of the philosophy of mind will greatly influence the plausibility of personal explanations. Dawes, for example, argues that because our only experience is of bodily agents, the concept of theistic explanation is quite strange and should be given a low background probability.²⁹² The conception of human persons adopted by Swinburne and members of the Intelligent Design movement is generally nonmaterialistic, and in such an ontology the possibility of theism does not seem as far-fetched as in a naturalistic ontology.²⁹³

Background knowledge is also important for guarding against frivolous intentional explanations, as I will argue in chapter 4. Here the cumulative nature of theistic natural theology is an important difference between ID and natural theology. Natural theologians such as Swinburne and Collins as well as theologians of nature such as McGrath consider the evidence of design as part of a much broader argument. It is part of a web of supportive theistic arguments and does not stand alone. Pre-existing reasons to believe in theism are

²⁸⁹ Meyer 2013, 392-398.

²⁹⁰ McCullough (2013) argues that explanations based on divine design need not shut down scientific enquiry: "*In that sense, divine-agent explanations do bottom out for the scientist, but that is not quite the same thing as saying that they shut down scientific inquiry. To invoke Apollo is to give an explanation that does not admit of further explanation, but it does not forestall alternate explanations. The sun can be said to rise because Apollo mounts his chariot, and there may be no getting behind his decision to some further cause of the morning; still, we can inquire whether there actually is a chariot, or a decision, or an Apollo.*

We can still inquire whether other explanations, implying an Apollo or not, make better sense of the data. The question is still open, in that sense; scientific inquiry is still possible. To posit a God in the gaps simply disallows an infinite chain of explanation."

²⁹¹ Aristotle, *Parts of Animals*, 644b32-35. Quoted in Zagzebski 2012, chapter 9.

²⁹² Dawes 2009, chapter 7.

²⁹³ Menuge 2004b; Dembski 2007; Larmer 2014, chapter 7.

even a formal premise in Collins' formulation of the design argument.²⁹⁴ As mentioned in chapter 3.1, the ID theorists too see a use for further religious and philosophical considerations in identifying the "intelligent designer" as the God of Christian theism. I will argue that they also recognize the influence of background beliefs on assessments of how strong the evidence for design is in nature. However, as I will also argue in the course of this study, the ID theorists believe the evidence of design can be so strong that belief in the existence of an unknown designer can be justified even if we have little or no evidence to think that he exists beforehand.

The *past explanatory success* of the explanation is the final criterion I will be considering in this chapter. Belief in the designedness of the cosmos has been an important historical background supposition of modern natural science. The importance of teleological concepts for the development of natural science is acknowledged by both critics and defenders of Intelligent Design, and as I will argue in chapter 6, teleological concepts continue to be used in biology.²⁹⁵ So, it is arguable that as a "metascientific idea", a philosophical idea that builds on empirical discoveries and guides scientific practice, design has indeed been scientifically fruitful.²⁹⁶ However, the historical importance of design does not demonstrate that design should continue to be a part of present-day science. Furthermore, fruitfulness as a philosophical background assumption does not necessarily equate to fruitfulness as an explanation within the natural sciences, acting on the same level as other theories.²⁹⁷

By contrast, in critiques of natural theology and ID, it is common to emphasize the historical success of the naturalistic research programme. The success of the natural science in explaining natural phenomena is taken to imply that in time, every mystery can be solved without reference to Gods or intelligent designers.²⁹⁸ In contrast, supporters of ID argue that the progress of science has also deepened the difficulty of some mysteries. Thinkers in the theology and science community usually similarly argue that the natural sciences have historically been fruitful in explaining certain kinds of phenomena, but other matters are more properly the domain of other disciplines. The use of the criteria of fruitfulness depends on our beliefs about the evidence: have the natural sciences indeed been able to solve all mysteries, and which ones does it seem likely to solve?

Types of Design Arguments

So, the Intelligent Design movement argues that nature's empirically detected order is best explained by the existence of an intelligent designer. According to Behe, design is the

²⁹⁴ Collins 2012, 207. I am also including considerations of the simplicity of the hypothesis (e.g. Swinburne 2011a) as part of the criteria of background knowledge.

²⁹⁵ E.g. Ratzsch 2001, chapter 11; Shanks 2004, chapter 1.

²⁹⁶ Collins 2006.

²⁹⁷ Shanks 2004, chapter 1; Kitcher 2007.

²⁹⁸ E.g. Kitcher 2007; Dennett 2006a, Dawes 2007. I will present more references in chapter 7.

“purposeful arrangement of parts”.²⁹⁹ It is interesting that for Behe, this same definition functions as a description for both “design”, the pattern of nature which is explained, and the process of intelligent design, which explains the rationality of this order. This indicates that Behe sees a fairly tight logical connection between design as a pattern and intelligent design as its explanation. The same idea can also be found in the other ID theorists’ writings. According to Dembski and Wells, design is an “*inherently teleological*” process, thus it is able to explain teleological patterns.³⁰⁰ According to Meyer, the creation of information is something that is typical to designers, and thus the information of DNA is best explained by reference to design. Meyer argues that creating such programmes requires “*forward-looking*” thinking, present in the activity of intelligent designers, but not possessed by mindless natural processes.³⁰¹ Thus, the order of nature is thought to be goal-oriented, purposeful or functional, and best explained by a goal-oriented process of intelligent design.

These examples reveal an important background assumption in the Intelligent Design movement’s design arguments. They require some kind of connection between design and intelligent design as a process. Some connection is already implied by the words the ID theorists use to describe nature: nature is full of “apparent design”, something that at face value looks like something that we would intuitively explain by the process of intelligent design. Speaking of “apparent design” makes it more plausible to argue that perhaps the design is not only apparent, but there also actually is an intelligent designer who has created this order. Behind all this is the principle that an explanation must fit that which is explained; the explanation must possess features relevant for understanding the existence of that which is explained.

However, design arguments are also supposed to be based on a description of nature that is in some way neutral or empirical. Thus the description of the order of nature must not already presuppose the conclusion of design. The validity of describing the order of nature as “apparently designed” must be based on some other grounds than the knowledge that it is in fact designed. The division of the design argument into two steps is commonly used to clarify this discussion. In the first step, the *argument to design*, it is argued that nature is ordered in some special way. In the second step, the *argument from design*, it is argued that these patterns are best explained by intelligent design. Certain features of nature are thought to exhibit the appearance of design, which is argued to be best explained by the existence of a real designer, as I showed in chapter 3.2.³⁰²

Design arguments can be broadly divided into two categories based on the type of empirical evidence used. First (1), there are *cosmic design arguments* appealing to properties of natural laws that are present everywhere in the cosmos, such their fine-tuning for life and their rationality. Cosmic design arguments are very popular even outside of the ID movement, and have been developed rigorously by philosophers such as John Leslie, Robin

²⁹⁹ Behe 2006a, 193.

³⁰⁰ Dembski & Wells 2007, glossary.

³⁰¹ Meyer 2009, 2004.

³⁰² E.g. Ruse 2007.

Collins and Richard Swinburne.³⁰³ Second (2), there are *biological design arguments*, based on the apparently purposeful complexity of biological organisms. Both types of arguments have been used by the ID movement, though the majority of the ID literature focuses on the biological design argument, and this is where ID's most original contributions to the debate have been made.³⁰⁴

Sometimes the ID theorists have expressed their focus on biology explicitly. Behe writes that "*by 'intelligent design' I mean to imply design beyond the laws of nature. That is, taking the laws of nature as given, are there other reasons for concluding that life and its component systems have been intentionally arranged?*"³⁰⁵ Johnson admits that naturalistic evolution leaves room for a Creator who set up naturalistic processes to do the "*work of creation*". However, for him this is not enough: "*If God stayed in that realm beyond the reach of scientific investigation, and allowed an apparently blind materialistic evolutionary process to do all the work of creation, then it would have to be said that God furnished us with a world of excuses for unbelief and idolatry.*"³⁰⁶ The implication would seem to be that fine-tuning does not provide enough evidence of a *theistic* God who has been active in natural history, as opposed to the God of *deism*, who merely set things up at the beginning. The ID theorists want to see if there is evidence of design beyond the laws and basic properties of nature.

However, cosmic design arguments are also important for the ID movement. Johnson sometimes gives very broad formulations of the design argument, such as the following: "*reality is simply too rational and beautiful ever to be forced into the narrow categories that materialism can comprehend.*"³⁰⁷ The fine-tuning argument is also present in the ID literature from the beginning. The early collections of ID articles, "*Mere Creation*" (1998) and "*The Creation Hypothesis*" (1994) included chapters on fine-tuning and the cosmic design argument. The later ID books "*The Privileged Planet*" (2004) and "*A Meaningful World*" (2006) even focus on cosmic design arguments. Many ID theorists reference the discussion on cosmic design arguments and use it as background for their own biological arguments.³⁰⁸

³⁰³ See chapter 5.

³⁰⁴ See chapter 6. Similar classifications are given by Sober (2003) and Narveson (2003). Narveson divides design arguments into local design arguments, concerned with local properties of nature such as biological organisms, and global design arguments based on the properties of nature which are present everywhere, such as the laws of nature. Local design arguments also include arguments based on the properties of the solar system, for example, not just biological design arguments. For example, Gonzales & Richards (2004) do also argue based on the properties of the solar system (which is an example of a local argument), and Behe (2007) references this argument as part of the background of the biological design argument.

³⁰⁵ Behe 2001, 696. Behe has not been totally consistent in this definition. At other times he writes as though believing in cosmic design is enough to make someone a believer in "intelligent design". Commenting on John Haught's view, which combines belief in cosmic design and Darwinism, Behe (1999) *argues that "despite chastising design theorists in his book, John Haught believes in intelligent design as much as does William Dembski."* This indicates the importance Behe nevertheless places on cosmic design arguments.

³⁰⁶ Johnson 2001, 443.

³⁰⁷ Johnson 2000, 152. Quotations on the importance of fine-tuning for the ID movement could be multiplied. For example, Dembski and Witt (2010, 30) consider the fine-tuning of the laws of nature and the problem of the origin of life as the two best arguments for intelligent design.

³⁰⁸ Moreland (ed) 1994, Dembski (ed) 1998, Gonzales & Richards 2004, Wiker & Witt 2006.

Behe explains the importance of the fine-tuning argument for ID in two ways. First, Behe argues that because the cosmic and biological design arguments are based on different sets of data, but reach the same conclusion, they exhibit the epistemically valuable phenomenon of consilience. A worldview that is supported by multiple independent lines of evidence may be stronger than one based on just one line of evidence.³⁰⁹ But Behe also argues that the cosmic design argument can function as background knowledge that gives increased plausibility for the biological design argument. Given evidence of cosmic fine-tuning, it does not feel out of place to also find evidence of biological fine-tuning, or that the existence of this biological fine-tuning requires the activity of the designer beyond the laws of nature and into the events of natural history: *"if we admit the possibility of an agent who can choose and implement the laws of physics for the universe, then there is no principled reason to think that implementing much greater fine-tuning would be beyond it."*³¹⁰ Behe thinks that it is inconsistent to allow for design at the cosmic level but not inside the cosmos in the events of cosmic and natural history. Rather, it is possible to affirm that the fine-tuning extends from the natural laws and the properties of nature into the events of natural history and many details of biology.³¹¹

Behe's argument is similar to those used for the possibility of miracles in the tradition of natural theology. Swinburne's argument for the plausibility of Jesus' resurrection has the arguments of natural theology as a background assumption. The plausibility of the existence of the sort of God who could act in history makes it possible to argue that some actual event, like the various historical data about Jesus, are best explained if we suppose that a miraculous act of God has occurred.³¹² Similarly, Craig Keener argues that our prior beliefs about the existence or non-existence of God cannot help but influence our evaluations of the evidence for miracles. Someone who rules out the existence of God *a priori* may not consider any evidence for miracles as sufficient. However, someone who thinks the existence of God is at least possible or even plausible can, according to Keener, be more open to the possibility of miracles.³¹³

As I will show in chapter 7, there are also theological understandings of divine action where a sharp difference can be made between divine action in creating the world, and divine action within the world. Behe's comments raise the question of the natures of the design arguments in the ID movement's argumentation and modern natural theology. Do cosmic design arguments help make biological design arguments possible, or is there some great difference between the arguments which makes this difficult? What are the commonalities and differences between these design arguments? According to Swinburne's

³⁰⁹ Behe 2007, 204-220.

³¹⁰ Behe 2007, 216.

³¹¹ For other examples, Meyer (1999b, 56-66) uses fine-tuning as a lead-in to his biological design argument, referencing philosophers Swinburne, Collins and others. Woodward (2003) also emphasizes the importance of fine-tuning and other cosmological discoveries in making ID a viable position.

³¹² Swinburne 2003.

³¹³ Keener 2011, 129 writes that *"no one who believes in historic montheistic understanding of God would deny the possibility of God influencing the system of nature; such a denial must be predicated on a prior denial of this sort of God."*

analysis, for example, modern natural theology seeks to deal with facts which are “too strange” or “too big” for natural science.³¹⁴ This type of natural theology works on a different level from natural science, and does not typically come into conflict with it.³¹⁵ By contrast, the biological design arguments of Intelligent Design seem to be intruding on the territory of natural science. The design argument is argued to be scientific, not philosophical.³¹⁶ For the ID theorists, design and Darwinian evolution are alternative explanations for the same phenomena. This causes much controversy, and the charge that ID is a “God of the gaps” -argument has been frequently made.³¹⁷ The same “God of the Gaps” -objection is also sometimes used against the arguments of the modern natural theologians, however.³¹⁸ Is there some reason why the objection works better against some design arguments but not others? Answering this question in detail will have to wait until a closer examination of the logic of design arguments in the following chapters. I will analyse the God of the gaps-critique in more detail in chapter 7.

3.4. Naturalistic Science?

Methodological Naturalism

In the discussion on Intelligent Design, much energy has been used to discuss whether Intelligent Design qualifies as part of natural science or not. The prominence of this theme is inherited from the discussion on whether it is permissible to teach creationism in public schools. The legal strategy for combating the teaching of creationism has been based on a strong methodological naturalism, in which all discussion of supernatural entities in the natural sciences is considered forbidden by definition. It was not enough to insist merely that creationism was bad science, it also had to be non-science. In the 1981 Arkansas Creationism trial, Judge William Overton defined science first as what is accepted by the scientific community or whatever scientists do. He then listed five narrower criteria: (1) Science is guided by natural law, (2) it explains by reference to natural law, (3) it is testable against the empirical world, (4) its conclusions are tentative, and (5) it is falsifiable.³¹⁹ In defining science as restricted to non-supernatural factors, Overton was following the testimony of philosopher of science Michael Ruse, who had argued in his testimony that “*any reliance on a supernatural force, a Creator intervening in a natural world by supernatural process, is necessarily*

³¹⁴ Swinburne 2004a, chapter 4.

³¹⁵ Stoeger 2010, 186.

³¹⁶ Dembski (2004a, 49) and Behe (2006a, 210-212) both argue that the design arguments of traditional natural theology were often poorly formulated and just statements of an intuition, whereas ID makes the argument rigorous, scientific and convincing.

³¹⁷ E.g. Miller 2002, Kitcher 2007, Shanks 2004, Haught 2003, Cunningham 2010.

³¹⁸ E.g. Stenger 2004, 182. See more in chapter 7.

³¹⁹ Overton 2009 [1981].

not science."³²⁰ After the trial, much critical discussion has ensued about these criteria, because they are not philosophically rigorous. Philosopher of science Larry Laudan in particular argued that though the outcome of the trial was good, the criteria used to judge science and their application to creationism were problematic. Laudan argued that scientific creationism contains much that is testable – and which has been tested and found false.³²¹

As seen in chapters 2.2 and 2.3, methodological naturalism of some sort is typically seen as an important feature of modern natural science. Natural science guided by methodological naturalism always looks for natural explanation for phenomena, rather than religious explanations. As Ronald Numbers argues, even Christian natural philosophy and natural science have always been guided by a "*preference for natural explanations over divine mysteries*" when dealing with natural phenomena.³²² It was thought that God had created a rational world, whose structure was open to human investigation. Explaining things by reference to God's mysterious will was not the default position of the natural philosophers; rather, they wanted to understand the natural processes which God had created. Similarly, many contemporary theists also restrict natural science to the study of natural causes, and adopt methodological naturalism.³²³

As I will argue in more detail in chapter 8.4, ID's emphasis on the scientific natural of design arguments is partly based on its desire for cultural influence and public impact. The movement recognizes the immense cultural authority of "science" and wants to reclaim it from naturalists. In challenging the sufficiency of the scientific theory of evolution and naturalistic philosophy in the public arena, they want to say that their critique and their alternative are also scientific. But ID's critics are also affected by political motivations and the desire to find simple arguments by which to thwart the prospect of ID being taught in public schools. In a collection edited by Michael Ruse on the creationism trials, philosopher Philip Quinn even argues that while there are good arguments against creationism, these may be too complex, and so "*there may well be circumstances in which only the bad effective argument will work against them in the political or legal arenas. If there are, then I think, though I come to this conclusion reluctantly, it is morally permissible for us to use the bad effective argument.*"³²⁴ I think this strategy is unfortunate. We should seek for the truth and reject bad arguments, even if they are expedient. My purpose here is to get beyond the politics and look instead at the philosophical and theological foundations of various views.³²⁵

³²⁰ Ruse 2009 [1981], 272.

³²¹ For some of the discussion, see the collection edited by Robert Pennock and Michael Ruse (2009).

³²² Numbers 2003, 266.

³²³ Numbers 2003.

³²⁴ Quinn 2008, 398.

³²⁵ Similarly Monton 2009b. Monton also presents other examples of the same tendency.

Intelligent Design's Critique of Methodological Naturalism

The critique of this naturalistic restriction of science has been part of the Intelligent Design movement's argumentation since its beginnings. Johnson commented on Judge Overton's decision already in his *Darwin on Trial*. Johnson argued that the naturalistic ground rules of science have led to a far too positive view of the powers of Darwinian evolution. According to Johnson, defenders of naturalism "*enforce rules of procedure that preclude opposing points of view.*"³²⁶ For Johnson, evolution is just applied naturalistic philosophy: if naturalism is assumed to be true at the start of our inquiry into origins, then living organisms must have evolved through naturalistic processes, no matter what the evidence seems to say. Following Johnson's argument, all the major thinkers of the ID movement believe that belief in Darwinian evolutionary theory and the veracity of a naturalistic origin of life owes more to philosophy than to science. In the ID literature, evolutionary ideas are traced back to the materialistic philosophy of Epicurus (341-274 B.C.), who already argued, prior to any of the discoveries of modern science, that the random movement of atoms eventually brings about more stable forms and even life.³²⁷

That philosophical ideas influenced the formation and popularity of evolutionary theory is fairly uncontroversial: what is controversial is the ID theorists' understanding that these factors are more important than the empirical results.³²⁸ The ID theorists thus argue that methodological naturalism can lead to a "naturalism of the gaps": a philosophical or even faith-based position which assumes that naturalistic explanations exist for all phenomena and cannot allow the consideration of real scientific problems with naturalism.³²⁹

Ratzsch has argued that much of the discussion on demarcation criteria and methodological naturalism has missed the central point the ID theorists have been trying to make. In methodologically naturalistic science as it is typically understood, scientific study of natural history works only on purely naturalistic theories. However, suppose that there really is a being "*whose purposes, decisions and actions are involved in the existence, governance or structure of physical reality.*"³³⁰ Suppose further that the actions of this being are responsible for the origin of life and much of its development, and that there are real "gaps" in the capabilities of natural processes nature.³³¹ In this case, reliance purely on the results of methodologically naturalistic science would produce a false picture of the history of life,

³²⁶ Johnson 1993, 118.

³²⁷ Wiker 2002. Wiker's analysis is lauded in the book by all of the major ID theorists. Similarly Lennox 2007, 96-99.

³²⁸ See e.g. Sedley 2007 for the ancient background and Ruse 2003 as well as Bowler 2009 on the historical development of evolutionary biology.

³²⁹ Dembski 2003b, Behe 2003b & 2005a.

³³⁰ Ratzsch 2002.

³³¹ I discuss the question of the God of the gaps further in chapter 7.

because it could not even in principle recognize this being's role and the really existing limits of naturalistic processes.³³²

I agree that this is the central point of the ID theorists' critique of methodological naturalism, and do not want to bypass it in this discussion. So, I will consider three different strategies for defending the exclusion of design from the natural sciences.

First, (1) one can argue that there is good reason to think that ID is false. A metaphysical naturalist can argue that it is very implausible that God exists and that he has influenced history. Similarly, a theologian could argue that we can only expect God to act in human history, rather than natural history. However, these responses to ID are not self-evidently correct. The non-existence of a God who acts in history cannot be simply assumed, but must be argued. And part of this process should also involve the detailed examination of arguments for design, such as those presented in natural theology and ID. Furthermore, it is problematic that here natural science becomes ideological, since methodological naturalism is here based on a worldview that is not universally shared even by scientists.³³³

Second (2), it can be argued that the restriction of science to the study of natural causes is not based on any bias against theology or design arguments, but is simply a humble admission of the limits of the scientific method. Perhaps design-based explanations simply don't fulfill the criteria of natural science, like testability. In this case, there is a very good justification for excluding such explanations from natural science. In chapter 3.3, I argued that ID is in some respects similar, but in other ways different from ideas that are typically considered to be part of the natural sciences. However, as I will argue below, defending ID's exclusion based on these criteria is not a simple matter.

The third (3) possible defence of methodological naturalism is much more promising. It can be argued that methodological naturalism as a research programme does not need to be pursued dogmatically. So, if it appears that the evidence supports something like ID, then at that point we will have reached the end of methodologically naturalistic science, and the beginning of something new - perhaps theology or some new kind of design-based science. But until that point, we can keep pursuing methodologically naturalistic science, because it has proven to be a historically fruitful approach. This critique might even allow ID in science in theory, but simply deny it in practice. This critique, too, has the benefit that it requires interaction with the evidence. ID's unviability as part of science must be demonstrated in practice, rather than assumed a priori.

³³² Much discussion of methodological naturalism and ID's status as natural science can be found in all major ID works, such as Behe 2006a, Johnson 1993, Dembski 2002a and Meyer 2009.

³³³ See the discussion in chapter 3.5. and Stenmark 2004, chapter 9 for critiques of ideological science. Hans Halvorson 2014 correctly points out that methodological naturalism is indeed sometimes defined as the idea that natural science should be done as though naturalism were true. Halvorson goes on to argue this cannot be how methodological naturalism was originally understood, since it was initially formulated in a theistic framework. (Similarly Numbers 2003, Bishop 2013) Rather, we must find grounds for methodological naturalism in the chosen limitations of the proper domain of the sciences.

Strong and Weak Methodological Naturalism

In the critical responses to the Intelligent Design movement, two different forms of methodological naturalism can be discerned. The first is strong (or hard) methodological naturalism, following Ruse's claim that *"any reliance on a supernatural force, a Creator intervening in a natural world by supernatural process, is necessarily not science."*³³⁴ Typically this form of naturalism is defended on the basis that the methods and theories of science are not suited to examining such questions. Thus the exclusion of the supernatural is not thought to be arbitrary, but based on the requirements of empirical science such as empirical testability.³³⁵ This type of idea of scientific methodological naturalism has also been important in the legal struggle against the teaching of Intelligent Design in public schools in the U.S.A.³³⁶ It is also one of the arguments used in the 2005 Dover decision to exclude the teaching of Intelligent Design from public schools.³³⁷

However, strong methodological naturalism is vulnerable to the previously discussed central criticism made by the Intelligent Design movement. It gives the Intelligent Design movement the opening to make a rhetorically powerful argument against their critics: if critics of Intelligent Design have defined design arguments as by definition unscientific and outside the possibility of rational consideration, then it becomes unsurprising that these critics do not see any evidence for design in nature, and their testimony against ID loses much of its force. Sometimes critics of ID who adopt strong methodological naturalism indeed do go so far as stating that *"even if all the data point to an intelligent designer, such an hypothesis is excluded from science because it is not naturalistic. Of course the scientist, as an individual, is free to embrace a reality that transcends naturalism."*³³⁸

As indicated by the quote, methodological naturalism can also be a way of making peace between faith and reason by keeping them separate. Indeed, it actually has Christian origins. Again, as Numbers points out, *"scientific naturalism was largely made in Christendom by pious Christians. Although it possessed the potential to corrode religious beliefs – and sometimes did so – it flourished among Christian scientists who believe that God customarily achieved his ends through natural causes."*³³⁹ According to Numbers, though the principle dates back perhaps to

³³⁴ Ruse 2009 [1981], 272.

³³⁵ See Pennock & Ruse 2011 for many arguments in this vein.

³³⁶ Pennock & Ruse 2009; Jones 2005; Dewolf, West, Luskin & Witt, Jonathan (ed) 2006.

³³⁷ Jones 2005. For analysis and commentary, see Nagasawa 2011, 95-101. Nagasawa argues that the premise that ID is unscientific is unnecessary for the purpose of combating the teaching of ID in schools. It is sufficient to say that ID has not been established as a viable alternative in the scientific community. I would argue that adopting strong methodological naturalism as part of the legal definition of science would, if successful, give a stronger legal basis for excluding creationism from schools, since on this understanding ID would by definition be outside science. In Nagasawa's definition, it is only excluded from science teaching as a practical matter to concentrate on theories that are deemed more viable by the scientific community. On the practical level, the debate about teaching ID then becomes a debate about pedagogy rather than a legal question.

³³⁸ Todd 1999.

³³⁹ Numbers 2003, 284.

medieval times, the term “methodological naturalism” itself goes back to Paul deVries and was coined to combat creationism.³⁴⁰

One modern defence of naturalistic science in these lines is provided by theologian John Haught. Haught argues that theologies of nature can incorporate the findings of natural science, but it is mistaken to use design as an explanation on the same level as natural science functions. According to Haught, theological accounts of nature are rather concerned with the ultimate character of reality, rather than operating on the level of scientific theories. “Thus, theology would have the role of ultimate explanation in an extended hierarchy of explanations that includes, and does not in any way compete with, scientific accounts.”³⁴¹ This type of hierarchical understanding of the relationship of different disciplines is very common in the theology and science community: each discipline is understood to have its own territory, to which its methods are best suited. While there can be overlap and dialogue between the disciplines, investigating questions of natural science with the methods of the humanities or theology is not likely to be fruitful.³⁴²

But to return to ID's central critique of methodological naturalism: suppose that a true fact about the world is that God created life through a miracle and that the origin of life would have been impossible otherwise. Suppose further that we can construct a good argument showing that design is the most credible explanation for the origin of life. Would it then be problematic to exclude design from science and instead say that some objectively very unlikely naturalistic hypothesis is the best scientific explanation for the origin of life? Can science have different criteria for selecting an explanation than the general criteria for what is a good explanation? Would it even be desirable to exclude some potentially true explanation from science? ID theorists argue that science should be a search for truth that does not exclude any possibility a priori, even evidence for intelligent design in the history of life. It could well be that the created reality does not respect the boundaries of scientific disciplines as they are understood in the hierarchical model.³⁴³

³⁴⁰ deVries 1986.

³⁴¹ Haught 2008, 35.

³⁴² Russell 2008, introduction.

³⁴³ Monton (2013, 46) puts this point eloquently: “If science really is committed to methodological naturalism, then it automatically follows that the aim of science is not generating true theories. Instead, the aim of science would be something like: generating the best theories that can be formulated subject to the restriction that those theories are naturalistic. More and more evidence could come in suggesting that a supernatural being exists, but scientific theories wouldn't be allowed to acknowledge that possibility. Imagine what might happen if the evidence becomes overwhelming – scientists might privately come to believe in the supernatural being, but scientific theories wouldn't be allowed to acknowledge that possibility. Long after overwhelming evidence has convinced everyone that the supernatural being exists, scientists would still be searching for naturalistic causes.

In this scenario, science would rightfully find itself a marginalized intellectual discipline. What would be the point of spending all the resources scientists have investigating natural causes, when it is evident that the causes are supernatural? I'm not saying that society would want to completely stop investigating the possibility of naturalistic causes, but by failing to countenance the possibility of supernatural hypotheses, scientists would be missing out on a revolution in our understanding of the world.

There is a way to respond to this critique and defend a non-dogmatic strong methodological naturalism. Defenders of the hierarchical model argue that the natural sciences do indeed exclude some good explanations, because these explanations are by definition part of another discipline, such as psychology or theology. So, if the best explanation for the origin of life was intelligent design, then the origin of life would on the hierarchical model no longer be a part of the natural sciences. Rather, it would be part of some new kind of design-based science, or even a part of theology, if we think the designer can reliably be identified as God. Strong methodological naturalism does not need to be held dogmatically, and it does not need to be a problem for strong methodological naturalists if some phenomenon is explained better by theological or design-based explanation. Rather, methodologically naturalistic science can be admitted to have limits.³⁴⁴

As long as one believes that natural science is not even meant to describe all of reality, it is possible to argue that some questions are not part of the realm that methodologically naturalistic science studies. But how does one in practice determine which questions are properly studied by the methodologically naturalistic natural sciences, and which questions are best explained theologically or psychologically? As I will argue in more detail in chapter 7, there is much disagreement here. For example, some believe that explaining the fine-tuning of the laws of nature is part of the domain of the natural sciences, while others think that theological explanations are called for at this point. The explanation of consciousness is a similar issue: some claim that consciousness will ultimately be reducible to physical explanations (and so is part of the realm of methodologically naturalistic science), while others hold that this will never happen. Similar questions also arise in the study of history: for example, should we explain the experiences of Jesus' disciples after the crucifixion by the methods of methodologically naturalistic history, or are theological explanations possible?

It is very difficult to determine the limits of the methodologically naturalistic science a priori. Rather, it seems to me that the limits have been determined based on the scientific, philosophical and theological arguments that can be made in each case. Does a particular problem (like the origin of consciousness, the origin of fine-tuning or the origin of life) seem like the kind of problem that the methodologically naturalistic sciences have a history of successfully solving? Do we have good reason to think that this particular problem can be solved by methodologically naturalistic science, or good reason to think that it will not? The discussion comes down to how good the arguments for various views are, and in the end cannot be settled simply by reference to the traditional boundaries of disciplines (as valuable as these are). If we think that biological problems are properly a realm where strong methodological naturalism applies, we have to present arguments for why we think this is so. These arguments will have to show why it is likely that we will find naturalistic

Thus, if evidence comes in against naturalism, investigation of the world that assumes naturalism has the potential to become otiose. Given the commitment to methodological naturalism, the success of science hinges of the contingent fact that naturalism is true." (Similarly Monton 2009a)

³⁴⁴ This comes close to the solution proposed by Halvorson (2014) based on a different argument.

explanations for all biological problems, and why things like ID's critiques fail to overturn these naturalistic explanations.

It seems to me that there is much merit to the hierarchical model of the relationship of the different sciences and theology. As I will argue in more detail in chapter 7.1, there are clearly questions that are outside the bounds of the natural sciences, such as the question of "*why something exists rather than nothing*."³⁴⁵ However, perhaps science could in principle have bearing on some more limited question related to the supernatural, such as whether there are natural explanations available for some claimed miraculous healing. The ID theorists' claim that life has the kinds of marks of design by which we recognize design elsewhere also appears like a question that the natural sciences have a bearing on, even though design arguments themselves are traditionally outside the natural sciences, and are typically considered to be the territory of philosophy and theology. The natural sciences are also clearly needed to investigate the credibility of biological design arguments based on the origin of life, because such arguments often have as one premise the improbability of the origin of life based on purely natural mechanisms. Such claims can only be justified based on scientific arguments. So, one can quite plausibly argue that science has at least some importance for design arguments even under strong methodological naturalism.

In contrast with strong methodological naturalism, *weak* (or soft) *methodological naturalism* argues merely that natural science contains a preference for naturalistic explanations, because such explanations are what the scientific method is most suited to examining, and because focusing on natural causes has been a fruitful approach historically. However, weak methodological naturalism also allows in principle for the failure of all naturalistic explanations and even appeals to supernatural factors if this is where the evidence leads. If there is a reason for saying that ID is not part of current science then this is based on ID's lack of success as a research programme, rather than the philosophical definition of science. Some critics have recently been moving away from the strong methodological naturalism advocated by Ruse and earlier critics of creationism.³⁴⁶ Thus Phillip Kitcher argues that Intelligent Design does qualify as science, and that even methodologically naturalistic science can be open to evidence of design. However, he goes on to argue that Intelligent Design is bad 18th century science superseded and refuted by the developments of science after that.³⁴⁷ Niall Shanks similarly argues that "*the methodological naturalist will not simply rule hypotheses about supernatural causes out of court*".³⁴⁸

Methodological naturalists of this type can maintain a critical openness to design arguments within science, while nevertheless favouring natural explanations.³⁴⁹ This type of

³⁴⁵ Turner 2004, chapters 11 and 12; Hart 2013.

³⁴⁶ Robert Pennock (2011) is one of those who continue to defend strong methodological naturalism in the current discussion. For critique of Pennock, see Monton 2013.

³⁴⁷ Kitcher 2007.

³⁴⁸ Shanks 2004, 141-142. Similarly, Sarkar (2011) also favours criticizing Intelligent Design based on its lack of scientific content, rather than demarcation criteria.

³⁴⁹ Kitcher (2007) similarly argues that design was once a part of science, but was abandoned because of the success of naturalistic science. For commentary, see Koperski 2008.

methodological naturalism avoids the central point of the ID theorists' critique, because it does not rule out the question of design based purely on demarcation criteria between science and non-science on theological or philosophical grounds, before considering the evidence and the quality of the arguments.³⁵⁰ Any problems in strong methodological naturalism do not imply that weak methodological naturalism could not still be a plausible position. In light of the difficulty of the demarcation problem, this position is quite attractive. As philosopher Yujin Nagasawa has also noted: "*it is much more difficult to show that intelligent design is not science as to show that it has not been established as a good viable scientific theory.*"³⁵¹

As Nagasawa notes, it is difficult to find a non-circular criterion which could be used to definitely rule out design-based explanation from biology. For example, suppose that only observable entities can be referenced in scientific theories. Because the intelligent designer of the cosmos and life has not been observed, he or she could not then be a part of science. But this is problematic, because the natural sciences typically allow for indirect observation and theories, which allows scientific status for the big bang theory, belief in electrons and so on. Or consider falsifiability as a criterion of science. One problem is that the core of theories can seldom be falsified directly: theories can often be amended to explain anomalies, and tests require the addition of auxiliary hypotheses to the theory. Ratzsch argues that even a hypothesis of supernatural design can have such testable parts, though the designer's existence cannot be falsified directly.³⁵²

Following the arguments of Laudan and others, the ID theorists question strict demarcation criteria. However, they claim that if we compare the types of arguments used in ID to scientific arguments, we find sufficient similarities to ground ID's claim to science. It is argued that references to intelligent design are already made in many sciences, such as the engineering sciences, the forensic sciences, psychology, archeology and history. It is then argued that we can identify design in biology on very similar grounds to those we use in these other sciences. It should be possible to investigate design as a possible cause within natural history, just as it can be recognized as a real cause within human history. In making this argument, the ID theorists typically also argue intelligent design can be testable, falsifiable, predictive and so on.³⁵³

In contrast to the ID movement, some adopt weak methodological naturalism for the purpose of arguing against theological claims with the authority of science. If theological

³⁵⁰ This also seems like the only way of avoiding the charge that methodological naturalism is question-begging (see Larmer 2003).

³⁵¹ Nagasawa 2011, 97-101. Similarly, Petri Ylikoski (2001, 51) argues that "*it is unclear why we should raise the issue of demarcation at all. An appeal to virtus dormitiva is a bad explanation outside science as well. We should be analyzing what makes explanations good in general. There are good explanations that are not scientific, and there are bad scientific explanations. It would be inconceivable, at least to me, if scientific and everyday explanations did not share some basic ideas about good and bad explanations. After all, science has its origin in common sense cognition. There should be some kind of continuity. Of course, it now includes much that is apparently incompatible with common sense, but I seriously doubt that this incompatibility also extends to the general principles of explanatoriness.*"

³⁵² Ratzsch 2001, chapters 7-11. See also Koperski 2008.

³⁵³ E.g. Johnson 1993, chapter 9; Meyer 1999a.

claims were a part of science, then scientists could claim expertise in evaluating them. Thus ID critics Maarten Boudry, Stefaan Blancke and Johan Braeckman argue that there are many ideas about the supernatural that scientific results could in principle corroborate or contradict: "not only in the life sciences, but also in other domains of inquiry, paranormal researchers and skeptics have investigated extraordinary claims which, if corroborated, would substantiate the existence of immaterial and supernatural entities" such as ghosts and extra-sensory perception.³⁵⁴ Even evolutionary biology itself has been historically formed in competition against the design argument, and so impinges on the truthfulness of at least some ideas about design, such as literalistic and progressive creationism. According to Boudry, Blancke and Braeckman, skeptics who restrict science from evaluating supernatural explanations give up their most powerful weapon in the fight against superstition and nonsense. It is important to be able to say that we can scientifically test and falsify at some such claims. However, this also means admitting that science could in principle also corroborate them.³⁵⁵

Sometimes it is difficult to classify positions as either weak or strong methodological naturalism.³⁵⁶ This is because even a thinker who in principle allows for design arguments within science can simultaneously believe in criteria of rationality that make any design arguments impossible in practice. For example, Dawkins begins his book *the Blind Watchmaker* by affirming that intelligent design is an intuitively very plausible explanation for biological complexity.³⁵⁷ In his later book *The God Delusion*, Dawkins even calls God a "scientific hypothesis", one that the progress of science has made unnecessary by providing better explanations.³⁵⁸ It initially seems that Dawkins is a weak methodological naturalist. His purpose in adopting this argumentative strategy is similar to that of Boudry, Blancke and Braeckman: if God is a scientific hypothesis, then he can argue that God has been driven out by better scientific theories.

However, on closer examination, it is clear that for Dawkins, the rules of rationality themselves mitigate against the design argument and belief in God. At the end of *the Blind Watchmaker* Dawkins considers the question of how the origin of life should be explained, and argues on philosophical grounds that even random chance is a better explanation for the origin of life than supernatural design. This is because, for Dawkins, the purpose of explanation is to understand the complex by referring to something less complex. The God hypothesis, according to Dawkins, postulates a very complex Creator to explain the

³⁵⁴ Boudry, Blancke & Braeckman 2012, 1159.

³⁵⁵ Boudry, Blancke & Braeckman 2012, 1159; Nagel 2008, 201; Nelson 1996.

³⁵⁶ Note that the terms strong and weak methodological naturalism are sometimes used in a different way. For example, Alvin Plantinga (2011, 175) defines weak methodological naturalism to mean natural science which does not assume either God's existence or his nonexistence, while strong methodological naturalism assumes the nonexistence of God as the basis of its method. However, both methodological naturalisms described by Plantinga are strong methodological naturalism in my sense, because according to Plantinga's definition they cannot even consider evidence for the existence of God or a supernatural designer.

³⁵⁷ Dawkins 1999, chapter 1.

³⁵⁸ Dawkins 2006, chapter 1.

complexity of the biological world and the order of the universe. Thus the God hypothesis doesn't really explain complexity, but only introduces more complexity.³⁵⁹

In his books, Dawkins emphasizes the existence of extremely convincing scientific evidence for evolution. However, it is clear that he also has strong metaphysical and philosophical reasons for his position. For Dawkins, naturalistic evolution is in fact the only theory that is even in principle capable of explaining the complexity of the biological world. This is because only it can reduce the complex to ultimately simpler beginnings. Thus even if there were no evidence for evolution, Dawkins argues, it would still be a better explanation for the origin of species than design. In the case of the origin of life, Dawkins regards blind chance as a better explanation than design, though he earlier rejected blind chance as an explanation in the case of biological evolution.³⁶⁰ Many critics have thus remarked that given Dawkins' philosophy of what scientific, rational explanations are, something like Darwinian evolution would have to be the most rational explanation even on purely a priori grounds.³⁶¹

It seems to me that the discussion on methodological naturalism has shown the difficulty of formulating a strict principle to exclude theistic and design-based explanations from science. However, this difficulty does not show that we cannot say anything about what makes the quality of a scientific theory good or bad. Speaking of the virtues scientific explanations or the values of science instead of absolute criteria seems a more promising approach. Testability (including predictive power), coherence with existing scientific theory, fruitfulness in opening up further avenues of research, simplicity and other criteria allow us to judge the scientific quality of competing theories and research programmes.³⁶² Using scientific virtues as criteria of judging the best explanation, one could (for example) argue that naturalistic theories of natural history are scientifically more virtuous than the competing research programme of Intelligent Design, which explains properties of nature by reference to an unknown intelligent designer.³⁶³ It is further possible to argue that though there are problems with naturalistic understandings of the world, ID represents a larger

³⁵⁹ Dawkins 1991, chapter 6. This argument is a condensed version of what would later become Dawkins' "main argument" in *the God Delusion: the improbability of God argument* (Dawkins 2006, chapter 4). Dawkins argues that all complex things are improbable, and that God would be very complex and thus his existence is very improbable

³⁶⁰ Dawkins 1991, chapter 6.

³⁶¹ E.g. Orr 2007; Plantinga 2007. Dawkins' criticism of the design argument here is dubious for a number of other reasons, as well. First, (1) the design argument arguably does not attempt to explain "complexity" or adaptation in general, but rather a specific instance of complexity. Second, (2) we seem to regard reference to human design as explanatory, even though humans are arguably much more complex than the artifacts they create. Third, (3) Dawkins' argument that God is complex is strange and ignores centuries of discussion on what God is like. (Feser 2008, Lennox 2007).

³⁶² The criteria for the best scientific explanation are controversial, and are of course linked to the question of what is the best explanation in general. I will have a little bit more to say about the latter question in chapter 7.4. See also Niiniluoto (2002, chapter 6.1) who differentiates between institutional and pragmatic criteria for measuring the success of science.

³⁶³ Here I am adopting Imre Lakatos' (1977) terminology of scientific research programs.

revision of science than these anomalies require.³⁶⁴ Thus, even if design were admitted as a possible part of science, one could continue to argue against it.

“In Principle” and “In Practice” -Reasons for Critiquing ID

Related to the discussion on methodological naturalism, Gregory Dawes has made a useful distinction between “in principle” and “in practice” reasons for rejecting theistic explanations. In principle-reasons would be reasons for excluding theistic explanations from ever being good explanations (within science or otherwise) and in practice-reasons are based on the actual successfulness of theistic explanations.³⁶⁵ Strong methodological naturalism requires that theistic explanations will in principle always lack some essential characteristic that is required of scientific explanations. Weak methodological naturalists can admit that theistic explanations can in principle possess explanatory power even within issues normally studied by natural science, but argue that these cases are exceptional or nonexistent. However, normally science is based on naturalistic explanations and these are science’s preferred mode of explanation.

Words have socially agreed upon meanings. If the socially agreed on meaning of the words “natural science” excludes design-based ideas, then that means that ID is not natural science as a semantic matter. However, definitions cannot settle the questions that form the more substantive content of the debate.³⁶⁶ If we were to accept scientism – the belief that science is only way or at least the overwhelmingly best way of gaining knowledge about anything – then the definition of science would indeed be the central philosophical question of the discussion on Intelligent Design. However, as I argued in chapter 2.3, we can recognize the immense success of the natural sciences without believing that science is the only reliable way to gain knowledge, or even that scientific theories are in every case better or more reliable than common experience, theology or philosophy.³⁶⁷ On my understanding, the quality of the arguments for different points of view is the crucial thing to be analysed, rather than the status of these arguments as science or non-science.³⁶⁸ If theistic explanation and design can never be acceptable explanations, then natural explanations are the only acceptable game in town not only within science but also outside of science. However, if theistic explanations are good, then it can be rational to believe in them, whether they are scientific or not.

³⁶⁴ Koperski 2008.

³⁶⁵ Dawes (2009, chapter 1).

³⁶⁶ Keener (2011, 189) argues the same for the discussion on miracles.

³⁶⁷ See further Ratzsch 2009b & Stenmark 2001.

³⁶⁸ In practice many arguments used to claim that ID is unscientific can be formulated as arguments that ID lacks some explanatory virtue, however. For example, the idea that ID is not science because design is not a good scientific explanation may imply that design is not a good explanation in any other sense, either.

In my analysis of strong and weak methodological naturalism, I have argued that defending methodological naturalism against ID's critique cannot be done in a way that allows us to bypass considering ID's arguments entirely. Under both strong and weak methodological naturalism, we need to be able to argue that phenomena like the origin and evolution of life are likely to be best explained on the level of the natural sciences without invoking designers.

This type of rejection of a priori arguments against ID is also implicit in all accounts in which the rise of Darwinian evolutionary theory is seen as the central reason why biological design arguments can now be rejected. Thus cosmologist Sean Carroll writes that *"A few centuries ago, for example, it would have been completely reasonable to observe the complexity and subtlety exhibited in the workings of biological creatures, and conclude that such intricacy could not possibly have arisen by chance, but must instead be attributed to the plan of the Creator. The advent of Darwin's theory of evolution, featuring descent with modification and natural selection, provided a mechanism by which such apparently improbable configurations could have arisen via innumerable gradual changes."*³⁶⁹ This implies that without Darwinian evolutionary biology, design would still be the best explanation for biological order. This assumes that design possesses at least some rationality as an explanation and cannot be dismissed on a priori grounds, just by invoking methodological naturalism or the agreed upon boundaries of scientific disciplines. At the very least, we need to argue that the generally agreed upon boundaries of scientific disciplines reflect the historical success of certain methods in answering certain types of questions.

Unlike some, I accept the ID theorists' claim that in the structure of their argument, a separate step is needed to identify the intelligent designer as God. Therefore, I agree that ID's initial design inference is comparable to the detection of finite designers. So, ID's design inferences can also be relevantly compared to the design inferences in forensics and history. Forensics and history are not natural sciences, but they are still types of science, and so I think there is merit to the argument that part of ID could in principle also be scientific, in the same way as other disciplines where design is detected are scientific. On this understanding, ID is a kind of integration of methods from the humanities and the natural sciences.³⁷⁰ However, as I will argue in the following chapters, the ID theorists often move between this minimalistic and a more robust theistic concept of the designer. Furthermore, their argument would be stronger if it was formulated openly theologically, using all the resources of the tradition of natural theology. In this case the ID theorists could also better engage the different philosophical ideas that inevitably affect evaluations of their argument.

Seeing ID as either science or not science is likely framing the options too restrictively. One could also believe that part of ID's argument is scientific, while part is better

³⁶⁹ Carroll 2003, 631.

³⁷⁰ Again, I want to note the possibility of a different position. If one doesn't accept the conceptual separation of the designer and God, then one can argue that ID's argument will always be theological, rather than scientific, even if there are significant analogies between the detection of divine and human design. As noted, this is the position taken by Russell (2005) and Sober (2007).

characterized as philosophical. For example, Collins argues that the difficulty of developing the basic idea of an intelligent designer into a detailed scientific theory makes it disanalogous with the best scientific theories. Thus it is better thought of as a philosophical idea than a scientific theory. However, Collins goes on to argue that the idea of a designer could still function as a background assumption of a metascientific research programme of intelligent design. This research programme could then include many parts (for example, the question of the exact limits of Darwinian evolutionary mechanisms) which can be investigated scientifically, and others which are better characterized as philosophical arguments (such as the design argument).³⁷¹

I have lingered on the question of methodological naturalism, since the discussion is often quite muddled. On the popular level, strong methodological naturalism is still a common argument used against ID, and the ID theorists themselves do not typically make the distinction between strong and weak methodological naturalism. Rather, all methodological naturalism is understood to be strong methodological naturalism, and simply an a priori principle used to reject ID. Furthermore, the hierarchical model of the relationship of the different sciences is also too seldom applied to the discussion. The philosophical conclusions of this chapter, if accepted, have the potential to move the discussion around ID towards the merits of ID's arguments and away from the question of the definition of science. The quality of the arguments is more important than the labels we give them.

3.5. Theistic Science?

Intelligent Design as Theistic Science

In chapter 3.4, I analysed methodological naturalism and some of the critique against strong methodological naturalism. I have argued that the question of the definition of science is a side-issue for the evaluation of the argument. To understand the structure of the argument, however, ID's ideas about science do need to be understood. Whereas methodological naturalism (as typically understood) seeks to build science on a non-religious foundation, the ID movement has often been understood by both its critics and defenders to be a project of theistic science, meaning a programme of natural science openly influenced by theistic beliefs. But the ID movement's relationship to the idea of theistic science is ambiguous, and the views of the majority can fit in the framework on weak methodological naturalism.

In the contemporary discussion, Alvin Plantinga has been the foremost defender of the idea of theistic science. Plantinga's argument has two main parts. First (1), Plantinga argues that science cannot always be religiously neutral. Though scientists can co-operate on many scientific questions regardless of their worldview or religion, some parts of science (such as

³⁷¹ Collins 2006.

belief in Darwinian evolution) are inevitably worldview-colored. Plantinga also argues for the non-neutrality of science on theological grounds: if the world is understood as the battleground between the “City of God” and the “City of the world” then it would be strange if natural science alone was outside the influence of this struggle. Second (2), Plantinga argues that Christian believers should consult all they know when forming, testing and evaluating scientific hypotheses. So, theological and philosophical knowledge should influence the practice of science. According to defenders of this theistic science, this would make getting at genuine truth about the world easier, because Christian beliefs are true. It would also, in Plantinga's estimate, be important for protecting the believing community from unwittingly embracing scientific theories that are based on naturalistic presuppositions that are not credible to Christians.³⁷²

In the ID literature, Johnson's “*theistic realism*” is an application of the theistic science - approach to the debate on evolution, creation and design arguments. Johnson argues explicitly that it is legitimate for Christian theists to take the existence of the Creator into account when trying to understand natural history and when interpreting the results of empirical science.³⁷³ On this understanding, since theists know that God could have used any mechanism in creating life, they can be open to seeing the signs of design in nature, and to discover gaps in the abilities of nature. These gaps can then be interpreted as evidence of divine intervention beyond the laws of nature.³⁷⁴ Thus on this understanding of Intelligent Design, the background assumption of theism makes it possible to consider design as a probable possibility for explaining the apparently rational structures of nature.

Other ID theorists have also sometimes been understood to be engaging in a project of theistic science.³⁷⁵ William Dembski has argued that “*Intelligent Design is just the Logos theology of John's Gospel restated in the idiom of information theory.*”³⁷⁶ From these and other statements by Dembski, it can be inferred that his information-theoretical arguments have been influenced by his interpretation of the biblical scriptures.³⁷⁷ Indeed, most of the ID theorists are Christian theists, and it is not unreasonable to assume that this must have influenced their thought about design. Understood like this, the ID movement's design argument might be seen as a reaffirmation of a pre-existing theistic belief through scientific discoveries or as “*faith seeking understanding*” to use Anselm's famous phrase.³⁷⁸

³⁷² I am following Ratzsch's (2004) understanding of Plantinga (1991; 2001).

³⁷³ Johnson 1995. Moreland (1994) also argues for theistic science in an early collection of ID-friendly articles, showing the influence of theistic science on the formation of ID. For Johnson (2000, 176), theism is actually the foundation of all reasoning, not just science: “*If reason is to be a reliable guide, it must be grounded on a foundation that is more fundamental than logic and that provides a basis for reasoning to true conclusions about ends. Instrumental reason is not enough. That is why the fear of the Lord is not the beginning of superstition but the beginning of wisdom.*” I will return briefly to Johnson's broad understanding of the necessity of theism in chapter 8.

³⁷⁴ Reynolds 1998.

³⁷⁵ As seen in the introduction, critics of ID typically portray Intelligent Design as a religious project.

³⁷⁶ Dembski 1999c.

³⁷⁷ Similarly Forrest & Gross 2003, 140-141.

³⁷⁸ On Anselm, see Williams 2013.

However, the reality is more complex than this, because in principle Johnson's theistic realism emphasises openness to different explanations. According to Johnson, theism supposes that God created nature in an orderly way, which makes it possible for us to study nature. However, theism is compatible with many different accounts of natural history. God could have used an evolutionary mechanism or he could have chosen to create living beings through miraculous instantaneous acts of creation. He could have hidden his actions, so that the order of nature would not give evidence of his actions, or he could have given us at least some evidence of his existence.³⁷⁹

Johnson argues that his theistic realism is actually a more open investigation of nature than methodologically naturalistic science. Theists believe that God could have used natural mechanisms and laws to do the creating, as in evolutionary theory, or God could have worked through miraculous events inside history, as in creationism. Instead of metaphysical speculation, theists must consult the empirical evidence to see what the most plausible account of natural history is, and what mechanisms God used in creating life.³⁸⁰ Johnson's emphasis on the independence of God from the world and his ability to create any sort of world at all is reminiscent of the medieval debates on the logic of "possible worlds".³⁸¹ Pierre Duhem dates the beginning of the scientific revolution at March 7, 1277, when a set of theses of Aristotelian physics was condemned as wrongfully imposing limits on God's omnipotence. Duhem argued that this led to the rise of empirical science, because now Christians could not discover how God had created the world based just on philosophical first principles, but had to rely on empirical observations and experiments.³⁸² This type of theistic background assumption can also be identified in many of the founders of modern science, such as Francis Bacon and Isaac Newton, and is commonly referred to in the theology and science -discussion.³⁸³

It seems that Johnson's theistic realism is quite minimalistic and insufficient to provide the conclusions of the ID movement's design argument. For an ID theorist working under his "theistic realist" paradigm, it is still necessary to examine the evidence and to make a design argument to show that a certain pattern in nature does give evidence of intelligent design by this Creator. Johnson too affirms this. He writes that "*the intelligent design position is not that miracles should be arbitrarily invoked in place of logical inferences from evidence, but rather that evidence pointing to intelligent causes, where present, should not be disregarded due to bias.*"³⁸⁴ In practice, Johnson's theistic realism therefore comes quite close to weak methodological naturalism. The major difference is that Johnson's theistic realism includes a higher background probability for the occurrence of miracles and finding evidence of design in nature.

³⁷⁹ Johnson 1995.

³⁸⁰ Johnson 1995, appendix.

³⁸¹ Knuuttila 1993.

³⁸² Koons 2003, 80.

³⁸³ Clark 2014, chapter 3.

³⁸⁴ Johnson 2000, 130.

Is there nevertheless a tension between theistic realism and the ID theorists' insistence that the design argument works independently of any religious presuppositions? Though they admit the effects of their Christian theology on the design argument, Dembski, Behe and Meyer all regard the virtues of design as an explanation to be quite obvious and commonsensical. Theism is not seen to a necessary background supposition for the design argument. In Behe's interpretation of Johnson, cultural, religious and philosophical reasons are required to convince people that the intelligent designer is the God of Christianity. However, Behe writes that the conviction that there is a designer is based on "*inductive evidential inference*". Scientific "*observation and experiment*" indicate that "*law-like regularities explain much of nature*", and "*intelligence accounts for other aspects*". Behe notes that the designedness of nature has also been affirmed by atheists and agnostics such as the astronomer Fred Hoyle. This means that the argument cannot depend on controversial religious premises, even though it may be more easily acceptable to religious thinkers and have religious implications.³⁸⁵

Dembski and Meyer have explicitly shown some support for a complementarist understanding of the dialogue between theology and the natural sciences. They believe that theology and science provide independent, but convergent perspectives of reality which both converge on the idea of intelligent design. On this model, science and theology are understood to be quite independent of each other, though they can find common ground. For Dembski and Meyer, design provides supportive evidence for Christian theism, rather than Christian theism providing a necessary basis for ID.³⁸⁶ The design argument does not have religious presuppositions, but it may have religious implications. This is where similar to Barbour's dialogue model, or Robert John Russell's model of creative mutual interaction, which I discussed in chapter 2.3. Dembski himself also notes the central difference: "*Where I part company with complementarianism is in arguing that when science points to a transcendent reality, it can do so as science and not merely as religion. In particular, I argue that design in nature is empirically detectable and that the claim that natural systems exhibit design can have empirical content.*"³⁸⁷

³⁸⁵ Behe 1999a . See also the discussion on Behe's thought experiments in chapter 8.2 and Behe 2006b for Behe's own account of how Johnson influenced Behe.

³⁸⁶ Dembski 1999, Meyer 1999a. The idea of convergence may be illustrated with a quote from the astronomer Robert Jastrow (2000, 106-107): "*For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries.*" The difference between theistic science and the type of neutral science seen in the convergence model seems to be parallel to the difference between theologies of nature and natural theologies analysed in chapters 2.4 and 2.5. The question is: Do design arguments start from a non-neutral religious starting point or from some supposedly neutral scientific starting point?

³⁸⁷ Dembski 2000b.

Intelligent Design as Naturalistic Science

In practice, most ID theorists' views of science can be characterized as "weak methodological naturalism", whatever the influence of their background suppositions. They think that the natural sciences should include a preference for finding natural explanations, but should also be open to evidence of intelligent design. For example, Behe argues that even if supernatural designers were allowed in science, "*the fear of the supernatural popping up everywhere in science is vastly overblown. If my graduate student came into my office and said that the angel of death killed her bacterial culture, I would be disinclined to believe her.*"³⁸⁸ According to Behe, science's belief in a rational, understandable, law-bound universe is not threatened by belief in a Creator, but is something that religion and science can agree on.³⁸⁹ Behe's weak methodological naturalism leads him to always look for naturalistic explanations, but also allows him to say that naturalistic explanations for something do not seem to be forthcoming.³⁹⁰ Behe attempts to define science in a way acceptable to the broader scientific community as follows: "*I count as "scientific" any conclusion that relies heavily and exclusively on detailed physical evidence, plus standard logic. No relying on holy books or prophetic dreams. Just the data about nature that is publicly available in journals and books, plus standard modes of reasoning.*"³⁹¹ As I will show in chapters five and six, the ID theorists argue that the problems of explaining the fine-tuning of the cosmos, the origin of life, and the origin of biological machinery point to the necessity of design as an explanation, using such "standard modes of reasoning."

While critiquing what I have termed strong methodological naturalism, the ID theorists typically also insist that their designer does not have to be supernatural. While Johnson's early argumentation in *Darwin on Trial* critiqued the way methodological naturalism bars supernatural design from science³⁹², later ID writings have emphasized that design can be detected without knowing anything about the designer and without reliance on any prior religious beliefs.³⁹³ The idea that ID does not require supernaturalism is common in the ID literature. Dembski, Behe and Meyer all emphasize that ID does not violate the rule against supernatural agents, because ID's designer is not identified as supernatural and indeed the question of the designer's identity cannot be settled by the scientific evidence. As seen in chapter 3.1, the ID theorists generally argue that the identification of the designer requires philosophical and theological arguments which are beyond science.³⁹⁴

Because of this emphasis, it seems to be open to the ID theorists to even accept strong methodological naturalism, but simply argue that their design argument does not violate its

³⁸⁸ Behe 2006a, 241.

³⁸⁹ Behe 2006a, 241.

³⁹⁰ Similarly Monton 2009a, 62.

³⁹¹ Behe 2007a, 233.

³⁹² Johnson 1993, chapter nine.

³⁹³ See Luskin 2008 for one overview.

³⁹⁴ Meyer 2009, 428-430; Dembski 2004a, chapter 25; Behe 2006a, 251.

limits. Sometimes later ID texts indeed agree with strong methodological naturalists that the supernatural should be barred from science. Thus William Dembski and Jonathan Wells argue in the ID textbook *The Design of Life* (2008) that “supernatural explanations invoke miracles and therefore are not properly part of science. Explanations that call on intelligent causes require no miracles but cannot be reduced to materialistic explanations.”³⁹⁵ However, the ID writers themselves do not defend any criteria for excluding the supernatural from science beyond saying that the supernatural is not required by their argument. The statement of the textbook is not typical of Dembski’s writings: elsewhere he writes that science should not exclude the possibility of “non-embodied designers”. This certainly sounds suspiciously supernatural.³⁹⁶ Allowing supernatural designers within science would be consistent with the ID movement’s critique of demarcation criteria between science and non-science. Dembski writes that “the fact that the designing intelligence responsible for life can’t be put under the microscope poses no obstacle to science. We learn of this intelligence as we learn of any other intelligence – not by studying it directly but through its effects.”³⁹⁷ Dembski’s defence here is that human intelligences also can’t be studied directly, but are only known through their effects. However, this defence also makes it clear that ID’s designer can’t be put under the microscope or studied directly any better than a designer identified as supernatural. In both cases the evidence presented is indirect, and it is unclear how the ID movement could consistently claim that supernatural designers cannot be part of science if the ID movement’s designer can be.

In any case, these defences of ID make it clear that the ID theorists do not generally believe their argument to require a theistic view of science. Behe, Dembski and Meyer all admit the effect of theistic beliefs on the credibility of the design argument, but go on to argue that their design argument and their critique of Darwinism is credible even without these presuppositions – as long as one does not accept a naturalistic metaphysical bias which makes such arguments impossible.³⁹⁸ The analysis of this chapter shows that the ID theorists generally see the design argument as supported by theistic premises, but not absolutely requiring them.

Intelligent Design and the Neutrality of Science

What should we think about this sort of influence of religion on the practice of science? In chapter 2.3, I introduced Mikael Stenmark’s analysis of the four different levels of the interaction between religion and science. These are the sociological level, the teleological

³⁹⁵ Dembski & Wells 2008, 13-14.

³⁹⁶ Dembski 2004a, 191. Similarly Behe 1998b, 34-35.

³⁹⁷ Dembski 2004a, 191.

³⁹⁸ E.g. Berlinski 2006 and Berlinski & Klinghoffer 2009; see also Monton 2009a. Antony Flew’s change of views from atheism to deism was also partly motivated by biological design arguments related to the origin of life. See Flew & Varghese 2007. Oppenheimer (2007) has challenged the evidential value of Flew’s change of views, arguing that an old Flew was misled by his Christian friends into changing his views without adequate justification.

level, the epistemic level and the theoretical level. Stenmark also differentiates scientific practice into the problem-stating phase, the development phase, the justification phase and the application phase. Stenmark argues that though there are some complications, it is in general acceptable for the problem-stating, development and the application of scientific results to be influenced by religions and ideologies. In chapter 2.3, I also noted some cases where science has influenced religion and vice versa. However, Stenmark goes on to argue that on the level of the justification of theories, science should seek to be worldview-neutral in the sense of not presupposing the truth of any ideology or religion.³⁹⁹

According to Stenmark, scientific theories should be accepted or rejected as science based on their scientific merits, rather than their fit with a particular ideology or religion. He gives several arguments in favour of this view. First (1), the neutral basis of science and the collaboration of scientists from different religious backgrounds is a historical ideal of science. Though scientists were influenced by religious considerations, they typically did not reference these while trying to justify a theory scientifically. Second (2), there are examples where ideologically directed science has led to serious distortions, such as Lysenkoism. This should lead us to be cautious about worldview-partisan science. Third (3), the acceptance of worldview-partisan science would lead to the fragmentation of the scientific community. In addition to theistic science, other forms of worldview-partisan science would include feminist science, left-wing science, Islamic science and naturalistic science. Fourth (4), if naturalistic science distorts the meaning of empirical results because of a philosophical bias, then this bias can be revealed and critiqued by a thorough philosophical analysis, even without theistic science. Actually, the acceptance of theistic science would mean that we could no longer critique scientists who present other ideological assumptions (such as atheism) as a part of their science.⁴⁰⁰

So, Stenmark argues that even if belief in a scientific theory or the motivation for doing scientific research is religiously motivated, this does science no harm. The important thing is that the arguments scientists use must not presuppose the truth of any religious creed and are as widely acceptable as possible. There are a few points which make Stenmark's defence of the neutrality of science friendlier to the project of theistic science than might initially seem, however. First, because Stenmark rejects scientism, he believes that rationality is not confined merely to science. Thus even if the evaluation of scientific theories must be worldview-neutral within science, it does not have to be worldview-neutral outside of science. *"It is compatible with the idea of a worldview-neutral science, that individual scientists can*

³⁹⁹ Stenmark 2004, chapter 9.

⁴⁰⁰ Stenmark 2004, chapter 9. Ratzsch (2004) defends Plantinga's theistic science against Stenmark's critique, arguing that science requires deep metaphysical assumptions, and in some cases worldview-neutrality may not be possible. Many open questions relate to this, and the history of science shows the influence of religious ideas on the metaphysics of science, as seen in chapters 2.3 and 3.4 of this study. However, Ratzsch's critique of Stenmark is based on a briefer presentation of Stenmark's argument which doesn't mention the possibility (discussed in the main text) that outside of science, religious believers can use evaluate scientific theories on the basis of their religious beliefs. Thus some of Ratzsch's critique (such as his suspicion that Stenmark comes close to scientism) misses the mark.

be rationally entitled to accept theories – – that are not accepted by the scientific community – – and do this for ideological or religious reasons."⁴⁰¹ Second, it seems that questions like "supposing the existence of God, what is the relative credibility of a naturalistic origin of life versus the origin of life as a supernatural miracle?" can be investigated in a worldview-neutral way, though these are better classified as philosophical and theological questions rather than scientific questions. So, Stenmark's model seems to allow for the work of formulating and evaluating science based on theological and philosophical ideas, though this would not be classified as part of natural science.⁴⁰² But this seems like just the sort of work the proponents of theistic science wanted, only without the prestige of the name of science.⁴⁰³

The ID movement has attempted to state its design argument in a worldview-neutral way, not presupposing the existence of God. In this way, ID is in agreement with Stenmark about the need for a theologically neutral view of science. However, as the following chapters will demonstrate, ID's quest for neutrality is a difficult one, because the evaluation of evidence for intelligent design in the history of life does not seem to be a worldview-neutral matter. While I adhere to the traditional ideal that the natural sciences should strive to be as worldview-neutral as possible, I also think that the debate on ID shows that different worldviews and theological ideas indeed have an impact on the assessment of the credibility of design arguments and Darwinian evolutionary theories. It is clear that ID's design arguments, however they are labeled, are not dependent just on natural science, but also on theology and philosophy. This will become more apparent in the following chapters, as I turn to investigate the logic of ID's design argument. However, I will return to some unfortunate consequences of ID's emphasis on the necessity of a scientific defence of design in chapter 8.

⁴⁰¹ Stenmark 2004, 246.

⁴⁰² Hopefully, influences can also happen in the other direction: in Stenmark's model, scientific evidence can lead us to change our theological and philosophical ideas.

⁴⁰³ As I understand the matter, it is a fact of human psychology that we tend to evaluate new ideas in the light of our pre-existing beliefs. (Zagzebski 2012, chapter 10) It follows from this that if a scientific theory comes into conflict with a pre-existing belief, then this will quite naturally lower our confidence in the scientific theory. It also follows from this that we will tend to have more confidence in scientific theories which fit with our other beliefs. But this should not cause us to despair: sometimes new ideas can also cause us to change our beliefs. Nor should we think of the influence of our beliefs on the acceptance of new ideas a strange or bad thing. The foundation of our old beliefs and our human traditions is what allows us to understand, receive and create new beliefs and even change our traditions. As seen in chapter 2.3, the history of natural science testifies to the effect of religions and philosophies on scientific research and vice versa. ID is by no means the only hypothesis whose evaluation is affected by worldviews and religious beliefs.

4. THE LOGIC OF THE DESIGN ARGUMENT

Design arguments are at the centre of the Intelligent Design movement's thought. There are many different kinds of design arguments, which differ not just by of the evidence used, but also by their logical argument structure. The division of design arguments into analogical, inductive and abductive (inference to the best explanation) forms is typical. All of these arguments are attempts to elaborate on the intuitive logic by which all humans are able to form their commonsense beliefs in design, and apply this logic to the order of nature.⁴⁰⁴ While the ID theorists have defended many different kinds of formulations of the design argument, I will argue that their argument is best understood as an inference to the best explanation, supported by analogies and inductive evidence. I will begin by analysing design-beliefs based on intuition and proceed to analyse different forms of the argument. In the process, I will also analyse many critiques of design arguments and present possible strategies for answering these critiques.

4.1. Design Detection as Perception

The Intuitiveness of Design in ID's Understanding

For the ID movement, belief in the designedness of the order of nature is a commonsensical belief which we tend to form when faced with the order of nature. Design is understood as a mode of explanation that all humans intuitively use in their everyday life. However, it is argued that design can also be refined into a rigorous scientific explanation, as in fields like archeology.

The intuitive credibility of design as an explanation is a commonly stated background assumption of the ID movement. Behe argues that *"the overwhelming appearance of design strongly affects the burden of proof: in the presence of manifest design, the onus of proof is on the one who denies the plain evidence of his eyes."*⁴⁰⁵ Behe is saying that the appearance of design can be very clearly perceived in nature, and this means that the burden of proof should be on those who dissent from this commonsense conclusion. According to Dembski, his mathematical design arguments give *"theoretical support to intuitions that most people have for a long time harbored."*⁴⁰⁶ Dembski argues that humans tend to intuitively infer design when they perceive a complex pattern conforming to some "specification" or rational pattern. For Dembski, this sort of intuitive design inference also triggers when humans perceive the order of natural

⁴⁰⁴ Ratzsch 2010.

⁴⁰⁵ Behe 2006a, 265.

⁴⁰⁶ Dembski 2005a.

objects such as animal organisms. Meyer also argues that his design argument on DNA leads to the same conclusion as “commonsense reasoning” on the matter.⁴⁰⁷

Recognizing the perceived commonsensical nature of the design inference helps make sense of a perplexing attribute of some early ID works, such as Johnson’s *Darwin on Trial* (1993 [1991]). The book contains little explanation of why design is a good explanation and instead focuses merely on critiquing Darwinism. But supposing that Johnson’s critique of Darwinian evolutionary theory were to be accepted, how would this prove intelligent design? Often, our ignorance of natural explanations can also lead us simply to search for other explanations. So, it is initially puzzling that Johnson does not appear to see the need to provide a positive argument for design, not just a negative argument against Darwinism. However, if the background assumption of the commonsensical nature of belief in design is taken into account, Johnson’s argument becomes more intelligible. Johnson is assuming design as an obviously logical and intuitively apparent explanation of biological life. Design is the default explanation for the ordered complexity of nature, as in Behe’s writings. Refuting the credibility of all alternatives means that design will continue to reign as the best explanation by default, without requiring any further positive argument in its favour.

In later writings, Johnson expresses the intuitiveness of belief in design in more detail. This is particularly clear in Johnson’s comments on natural revelation: “*That God created us is part of God’s general revelation to humanity, built into the fabric of creation.*”⁴⁰⁸ That Johnson is thinking particularly of the evidence of design in nature is apparent from what follows the quotation – references to naturalistic biologists who nevertheless feel that nature bears the appearance of design. Johnson quotes Dawkins’ definition of biology: “*biology is the study of complicated things that give the appearance of having been designed for a purpose.*”⁴⁰⁹ This quotation from Dawkins and others like it are prominent in the ID literature and are quoted by Behe, Dembski and Meyer to show the strength of the evidence of design. The argument is that if even a strong critic of religious belief like Dawkins can acknowledge the appearance of design as a central feature of biology, then that appearance must be very strong indeed.⁴¹⁰ The intuitiveness of design is then used as part of the argument for at least considering the possibility of design as an explanation, rather than just dismissing it a priori: “*there is something curious about the scientific denial of our ordinary intuition about living things.*”⁴¹¹

The intuitiveness of design-based explanations also helps make it more plausible that the conclusion of design is different from the identification of the designer as God. If the conclusion that nature’s order is designed is initially reached through the same cognitive apparatus that is also responsible for detecting human design, then the initial basis of the conclusion is not based in any religious tradition. In that case our cognitive processes will only supply us with the initial idea that there is design, but the identification of the designer

⁴⁰⁷ Meyer 2009, 17.

⁴⁰⁸ Johnson 2000, 152.

⁴⁰⁹ Dawkins 1991, 1.

⁴¹⁰ Behe 2006a, 264-265; Dembski 1999, 125; Meyer 2009, 20-22.

⁴¹¹ Meyer 2009, 20; similarly Dembski 1999, 125.

will depend on some other process.⁴¹² A conclusion that is initially arrived at in this manner could later be integrated into a religious tradition and supported by further philosophical and theological arguments.

The Intuitiveness of Design in the Cognitive Science of Religion

In recent decades, the idea that humans intuitively see nature as designed has received support from research in the cognitive science of religion. Teleological explanations are argued to be natural to us humans in the sense that they accords with our natural cognitive tendencies, and so are easy for us to accept. Some even argue that children are “intuitive theists”.⁴¹³ Even adults appear to have the same intuitive tendency to explain things by reference to purposes.⁴¹⁴ As Ratzsch puts the point, “*design thinking may be natural to our sorts of intellects*”.⁴¹⁵ There is some controversy over interpreting these results. While most participants of the discussion agree that this natural tendency can help explain the persistence of belief in the designedness of nature, there is disagreement over whether this undercuts our rationale for believing in design, or in other religious beliefs which fit well with our cognitive architecture.⁴¹⁶

Some skeptics of design arguments have claimed that our detection of purpose in nature is an evolutionary accident. A mechanism which has evolved to serve in the recognition of natural agents erroneously also activates when observing the order of nature.⁴¹⁷ Justin Barrett has argued that the postulated human cognitive mechanisms responsible for detecting agency are hyperactive: we have a hyperactive agency detection device (HADD). In the distant evolutionary past, it may have been useful to have a bias to regard noises produced in the forest as the product of agents, since this would have allowed our ancestors to avoid predators.⁴¹⁸ Stuart Guthrie argues that such evolutionary explanation for the functioning of our design-detecting faculties should lead us to be skeptical about our intuition that nature is designed.⁴¹⁹

What should we think about these results? One possible conclusion is that we should reject all of our intuitive judgments about design as unreliable, and only believe in design when a rigorous argument in favour of design can be made independently of the intuition of

⁴¹² See Mullen 2004, 4.

⁴¹³ Kelemen 2004; see also Johnson 2003.

⁴¹⁴ Järnefelt 2013, McCauley 2012.

⁴¹⁵ Ratzsch 2010.

⁴¹⁶ See Visala 2011 and De Cruz & Smedt 2010 for two helpful reviews of the discussion.

⁴¹⁷ Recker 2010, Bloom & Weisberg 2007, Guthrie 2006.

⁴¹⁸ Barrett 2004. Barrett himself does not draw any anti-religious conclusions from his research.

⁴¹⁹ Guthrie 2006. Different explanations for why we intuitively perceive design in the universe lead to different conclusions regarding the reliability of this perception. The existence of the HADD could help atheists explain the persistence of religious beliefs, but from a different standpoint theists can argue that the Creator has designed us to be able to see the order of nature as evidence of his existence. (See Visala 2011; DeCruz & De Smedt 2010)

design.⁴²⁰ However, I think this is taking the results too far. First (1), as Aku Visala has argued, it would be strange indeed to discard some explanation as unreliable merely because it fits with our cognitive architecture. This would be saying that unintuitiveness is a merit of theories: we believe them because they are absurd.⁴²¹ Second (2), our argued propensity toward teleological explanations does not make all our intuitive teleological explanations unreliable. Those of us who are not eliminativists believe that we can indeed reliably identify human artefacts as designed and identify that other humans also have minds, so it appears that our design detection is still reliable most of the time. Furthermore, sometimes our intuition of design is far stronger than at other times. For example, in the case of the noise in the forest it is far weaker than when reading a book, or when observing the structure of organisms or the rationality of the laws of nature.⁴²² If the same process causes us to perceive design in both human artefacts and in nature, we need to be able to specify why we reject the intuition in one case but not the other. Otherwise it seems more coherent to accept the *prima facie* reliability of the intuition either in both cases or in neither.⁴²³

It is clear that human intuitions and beliefs are often mistaken. This conclusion is supported both by scientific research and our common human experience.⁴²⁴ However, the idea that we should adopt a *prima facie* trust in the beliefs formed by our cognitive faculties does not imply that we should believe our cognitive faculties to be infallible. Defenders of commonsense rationality allow that our commonsense beliefs can be altered and defeated by the evidence. They simply argue, quite plausibly, that we must have at least some trust in our intuitions and common sense for the process of rational inquiry to get even started.⁴²⁵ So,

⁴²⁰ Nagasawa 2009, 56-57.

⁴²¹ Visala 2011.

⁴²² See de Ridde 2014, 42-51 for further defense of the *prima facie* reliability of our design detection mechanisms.

⁴²³ This strategy is taken up by Mullen (2004). Mullen argues that we can analyse the “triggering conditions” that typically cause us to form an intuitive belief in design, and then see whether these conditions are fulfilled in the case of the order of nature. If these conditions are met, then “*the burden of proof shifts from the one who hold a design belief to the one who does not, provided that there is agreement about what the triggering conditions are and whether they are met.*” (2004, 8) To determine the triggering conditions, Mullen analyses several examples of design detection that any model of design detection should explain, as well as potential defeaters for the reliability of the design perception. This is one possible way of bringing the discussion forward, even if design detection is seen as an intrinsic human capability not amenable to description as an argument.

⁴²⁴ Trout 2002.

⁴²⁵ See e.g. Dougherty 2014, 57-61. Ratzsch (2009; 2001) similarly argues that while natural science shows human intuitions to be often unreliable, it also simultaneously depends on the reliability of human intuition. According to Ratzsch, the entire enterprise of Western natural science is predicated on the assumption that there is a fundamental correspondence between the rationality of the human mind and the rationality of the universe. Because of this correspondence, we can investigate and understand the world. If we ask enough “why” questions about why some evidence confirms a theory, at some point we will simply have to answer “because this is how I feel” even in justifying scientific theories. At some point in every argument, one just has to trust our ability to recognize rationality. According to Ratzsch, one could argue that trusting in our perception of design in the universe is warranted just like any other conceptual capability. Another argument against total skepticism regarding our everyday experience and cognitive capabilities is the following: It is difficult to see how we could argue against the reliability of our *prima facie* beliefs without assuming the reliability of at least some such beliefs. For example, when reading a scientific study about the unreliability of commonsense reasoning, one nevertheless has to trust in the commonsense conclusion that one is reading a scientific study about the matter.

it seems plausible to claim that the triggering of our design detection faculties in the case of nature does provide at least some reason to believe in design. However, as with other commonsense beliefs, this initial reason could be overthrown by some further arguments. This is just what many critics of design arguments in fact claim. For example, Dawkins sees biology as the study of things that appear to be designed, but goes on to argue that Darwinian evolutionary theory shows that this design does not have its origin in a designing mind, but in the operation of natural selection.⁴²⁶ Discussion of the validity of these defeaters can also make discussion on the reliability of our intuitions on design possible. Thus Alvin Plantinga, for example, argues that Darwinian evolutionary theory actually doesn't provide a defeater for belief in design even if it is correct, while the ID movement argues that Darwinian evolutionary theory does not explain the appearance of design in biology.⁴²⁷

Perception of Design or Argument?

I have argued that there is validity to the idea that design beliefs are initially based on an intuition about design. Those who trust in this intuition see our design detection as just another human cognitive faculty that we simply have to trust in *prima facie*, just as we have to have some trust in our other perceptual capabilities. But could design beliefs also be based on arguments? Already Thomas Reid (1710- 1796) argued that belief in design is based on a non-inferential capacity to detect design that all humans have and that is required to detect even the intelligence of other humans. According to Reid, design arguments can act to reinforce the reliability of this initial perception, but such arguments are not necessary for belief.⁴²⁸ Some defenders of this idea of design detection go further and argue that all design arguments in fact presuppose the reliability of the design intuition. The argument is that design arguments do not really add anything to our certainty of design, but only succeed in restating the intuition. William Whewell (1794-1866) stated this view eloquently:

When we collect design and purpose from the arrangements of the universe, we do not arrive at our conclusion by a train of deductive reasoning, but by the conviction which such combinations as we perceive, immediately and directly impress upon the mind. 'Design must have a designer.' But such a principle can be of no avail to one whom the contemplation or the description of the world does not impress with the perception of design. It is not therefore at the end but at the beginning of our syllogism, not among remote conclusions, but among original principles, that we must place the truth, that such arrangements, manifestations, and proceedings as we behold about us imply a Being endowed with consciousness, design, and will, from whom they proceed.⁴²⁹

⁴²⁶ Dawkins 1991, 1.

⁴²⁷ Plantinga 2011, chapters 1-2; see also Mullen 2004, 174-184. I will return to the ID movement's arguments on this in chapters 6 and 8.

⁴²⁸ *Essays on the Intellectual Powers of Man* (1785), essay V.

⁴²⁹ Whewell 1834, 344, quoted in Ratzsch 2010.

In this quotation, belief in design is understood to emerge as the result of how the order of nature influences the mind. The mind is not portrayed as a wholly passive recipient of this natural revelation. Rather, the mind interprets nature through the principle that certain types of order imply a designer. Design arguments can be formulated only if we already believe in design before the argument.

In the contemporary discussion on design arguments, Plantinga has also defended the idea that design beliefs are based on the normal functioning of our cognitive faculties, rather than arguments. Just as we immediately form the belief that other minds exist, so also certain types of order elicit in us the belief in design. According to Plantinga, belief in the designedness of the cosmos arises not primarily through arguments, but through design discourse. This means that the description of certain features of the cosmos causes in us a powerful impression that there must be an intelligent cause, and this is sufficient justification for believing in design. Plantinga is not opposed to design arguments as such, but argues that beliefs based on this non-inferential design discourse may be more resistant to critiques than beliefs based on arguments.⁴³⁰

The debate about whether our own subjective experience of design already provides us with sufficient grounds for belief in design resembles the contemporary epistemological debate about the necessity of natural theology. The idea that we should trust in all of the beliefs formed by our belief-forming faculties until we have reason to doubt them is defended by a broad variety of thinkers based on very different epistemological views. For example, it is accepted in both the reformed epistemology defended by Plantinga⁴³¹ and the evidentialism of Richard Swinburne.⁴³² The difference between the viewpoints here is whether it is necessary to also provide arguments for religious belief in addition to these subjective reasons. Evidentialists like Swinburne believe that in the presence of disagreement about the reliability of religious belief, presenting publicly available evidence and detailed arguments in favour of the existence of God is important.⁴³³

⁴³⁰ Plantinga 2011, chapter 2. See also de Ridder 2014 and Kroeker 2014 for discussion and expansions of Plantinga's position.

⁴³¹ Plantinga (2000) argues that believing in the reliability of Christian beliefs is dependent on our pre-existing belief in God or lack of it. According to Plantinga, "warrant", the property which for Plantinga differentiates between knowledge and belief, is based on the reliable functioning of our belief-forming abilities. But the reliability of our belief-forming abilities regarding the Christian God depends on whether God exists or not. If God exists, then he can guide Christians by his Holy Spirit to gain true beliefs about God; if God does not exist, then Christian beliefs are based on unreliable cognitive mechanisms.

Similarly, William Alston (1991) argues that human knowledge is typically based on different doxastic practices which cannot be justified without assuming their reliability. Thus the reliability of perception cannot be justified without appeal to perception and the reliability of reason cannot be justified without relying on reason. If Alston's account is correct, the same could in principle also be true of design detection.

⁴³² According to Swinburne (2004b) we should have a *prima facie* trust in our beliefs. If I find myself with the belief that there is a tree in front of me, then I have good grounds for believing that there is a tree in front of me. See also Stenmark 1995 for another epistemology defending the necessity of a *prima facie* trust in the beliefs we find ourselves with.

⁴³³ Swinburne 2004b.

The extent to which design arguments depend on prior intuitions about the world is a question that can only be settled by a detailed examination of the logic of design arguments. It seems to me that the argument does indeed depend on the ability of our mind to recognize a conceptual link between certain types of order and the purposeful actions of an intelligent agent as a good explanation for this type of order. However, this does not mean assuming the conclusion of the argument. As I argued in chapter 3.2, design arguments do not need to assume the reality of teleology before the argument, but merely the appearance of teleology.

Given that design beliefs indeed appear to rise intuitively quite often, does this mean that there is no need for arguments? I think not. Previously in this chapter, I have argued that even basing the conclusion of design on intuition doesn't need to end the discussion. There will still be many ways in which the validity of the intuition can be analyzed. For example, we can ask if the triggering conditions for the intuition are similar to those of cases where we trust such intuitions about design.⁴³⁴ In our everyday lives we can differentiate between the weak evidence of design presented by conspiracy theorists and the reliable knowledge that a computer is designed. It seems that we are not at the mercy of our "agency detection device", but can evaluate how convincing it is at least in some way.

In the discourse on natural theology, it is often also argued that the many of the arguments of natural theology develop certain human intuitions about the world into arguments, and thus help expand and evaluate the basis of our intuitive beliefs.⁴³⁵ Perhaps design beliefs could be a case where we can formulate the underlying logic of the intuition in the form of an argument. The credibility of our commonsense beliefs can often be tested by reflective thinking. It can be asked: how does my subconscious cognition come to the conclusion that nature is designed? Furthermore, how sound is the basis of the intuition? Discussion on the credibility of the design intuition would similarly be helped if it could be developed into a rigorous argument. If the design argument's premises can be shared by both the theist and the atheist, and the argument is good, then this will help the case for the reliability of the design intuition. If the credibility of the argument depends to a great extent on our prior religious and ideological commitments, then this will also be good to note.

Furthermore, even if belief in design gains some *prima facie* credibility from simple design discourse, it does not follow that the strength of our beliefs in design could not be influenced by arguments. As Daniel von Wachter has noted in response to Plantinga, "*If Miller first sees hoof marks in the field and think 'it seems to me that cows have entered the field' and then sees a cow in the field, then his belief is supported by evidence as well as by a perceptual experience. So, a belief can have any mixture of inferential and non-inferential support.*"⁴³⁶ Furthermore, it seems to me that such basic beliefs can also be contradicted by our further evidence and arguments, as Plantinga himself recognizes. This means that both supporters and critics of design arguments can find value in studying arguments, even if they accept the

⁴³⁴ Mullen 2004.

⁴³⁵ Evans (2010) makes the case for this understanding of natural theology well.

⁴³⁶ Von Wachter 2014, 60.

idea that the design intuition grants prima facie plausibility to design. Supporters can argue that the reliability of this intuition can be further supported by arguments, while critics can argue that arguments show the unreliability of the initial intuition by providing a sufficient amount of counter-evidence.

It seems to me that this is a good way to proceed in order to enable reasoned dialogue about the basis of our beliefs, but the fact that design beliefs are influenced by more than just arguments is good to keep in mind. In this conclusion I agree with the ID movement, which attempts to defend the reliability of the design intuition with design arguments.⁴³⁷ I will now turn to analyse how its design argument should be understood and whether it can avoid the critiques that are commonly directed against design arguments.

4.2. Traditional Ways of Formulating the Argument

Paley's Watchmaker and Hume's Critique

I begin my analysis with William Paley's classic argument from his *Natural Theology* (1802), and the understanding of the design argument as an analogy. This is the traditionally used example of design arguments in the philosophy of religion, and it is important to understanding Intelligent Design's similarities and differences with Paley's argument. Paley's famous analogy runs as follows:

In crossing a heath, suppose I pitched my foot against a *stone* and were asked how the stone came to be there, I might possibly answer that for anything I knew to the contrary it had lain there forever; nor would it, perhaps, be very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be inquired how the watch happened to be in that place. I should hardly think of the answer which I had before given, that for anything I knew the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? Why is it not as admissible in the second case as in the first? For this reason, and for no other, namely, that when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose – –. Every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference, on the side of nature, of being greater and more, and that in a degree which exceeds all computation.⁴³⁸

Paley argues that nature has the same indications of design as the watch, only that the evidence of design in nature is even stronger. Because of the prominence of the analogy at the beginning of Paley's *Natural Theology*, Paley's argument has often been understood to be an analogy also by its logical structure. So understood, the conclusion of design is formed on

⁴³⁷ According to Edis (2006, 9) this is the primary purpose of the Intelligent Design movement.

⁴³⁸ Paley 2006 [1803], chapter 1.

the basis of nature's likeness to human artefacts.⁴³⁹ The basic presupposition of the argument understood as an analogy is that it is plausible to believe that similar effects are created by a similar cause. This then makes it possible to argue that because living beings are in some ways machine-like, they are products of intelligent design, just like man-made machines. Ratzsch formulates the logic of the analogical design argument as follows:

1. Entity *e* within nature (or the cosmos, or nature itself) is *like* specified human artefact *a* (e.g., a machine) in relevant respects *R*.
2. *a* has *R* precisely *because* it is a product of deliberate design by intelligent human agency.
3. *Like* effects typically have *like* causes (or *like* explanations, *like* existence requirements, etc.)

Therefore:

4. It is (highly) probable that *e* has *R* precisely because it too is a product of deliberate design by intelligent, relevantly human-like agency.

David Hume criticized this form of the argument on several points in his *Dialogues Concerning Natural Religion* (1779).⁴⁴⁰ Hume argued, against premise 1, that at least the analogy between the cosmos and machines is very distant, and the strength of the inference is thus logically weak. Against premise 3, Hume argued that similar properties may be produced by different causes in different cases. Alternative explanations could be based on chance, for example, or some natural principle capable of generating design-like order.⁴⁴¹ Many philosophers and biologists consider Darwinian evolutionary theory significant here. They argue that Darwin provided a natural mechanism which can explain the evidence used in biological design arguments at least as well as the design hypothesis. Following Paley's watchmaker analogy in an ironical way, Richard Dawkins has thus termed Darwinian natural selection "the blind watchmaker".⁴⁴² These concerns, if valid, render the probabilistic conclusion of the argument quite weak.

Hume's criticism identifies an important problem in analogical design arguments. As Ratzsch notes, "*any two (groups of) things have infinitely many properties in common and also differ in infinitely many respects.*"⁴⁴³ So, how can an observed similarity in some properties lead

⁴³⁹ For many references, see Oppy 2006, chapter 4.

⁴⁴⁰ I should note that Hume was not writing in response to Paley. Hume's *Dialogues* was published posthumously in 1779, well before Paley's work. Paley explicitly mentions Hume's arguments on the problem of natural evil in chapter XXVI of his *Natural Theology* (1809). Hume's argument may well have been directed against Newtonian cosmic design arguments more than biological design arguments (Hurlbutt 1985).

⁴⁴¹ Hume further argued that even if the argument succeeds, it at most succeeds at showing the existence of a human-like designer, rather than the God of theism, and that the problem of natural evil militates against the argument. These criticisms are significant, and will resurface continually during the following chapters.

⁴⁴² Dawkins 1989.

⁴⁴³ Ratzsch 2010.

reliably to the conclusion that the two objects are also share some other property (such as being designed)? After all, the other property could also be one of the differences. It must be shown that the similarity is somehow relevant with respect to the conclusion, or the argument fails. As Ratzsch says: “Whether or not artefacts and natural objects are alike in ways that would support transfer of design attributions from the former to the latter depends upon exactly what the relevant Rs are.”⁴⁴⁴

In the ID movement, Michael Behe and William Dembski have both defended analogical design arguments, though they state that analogy is not their preferred formulation. Behe and Dembski argue that Hume’s understanding of analogical design arguments is faulty. Their understanding of Hume’s criticism is that in the *Dialogues*, the skeptic Philo represents analogical arguments as comparisons of the entire lists of properties that objects have, rather than just the relevant properties.⁴⁴⁵ There is support for this interpretation in the *Dialogues*. Philo argues that analogies are more reliable when two very similar objects are compared. Comparing humans and dogs, and observing that humans have circulation of blood, we might infer by analogy that dogs also likely have circulation of blood. Comparing humans and vegetables, the analogical argument would be far less reliable, because of the many differences of properties. Since the differences between the cosmos and machines, and between biological organisms and machines are vast, this difference therefore renders the analogy unreliable.⁴⁴⁶

In response to this understanding of Hume’s criticism of analogical design arguments, Dembski and Behe argue that Hume has missed the point of analogies. There is no consensus on the exact structure of analogical arguments, but they are often understood to be comparisons between relevant subsets of properties which the compared objects have, rather than all of their properties.⁴⁴⁷ In this vein, Behe argues that machines possess the property of “irreducible complexity” (to be explained in detail in chapter 6.1.). Behe argues that this property is known, in the case of man-made machines, to always require intelligent design as its explanation. Furthermore, it is known to be extremely difficult to explain by non-purposeful mechanisms. Therefore, Behe argues, the same property, when encountered in biological life, is also probably the product of intelligent design, rather than non-purposeful mechanisms. Furthermore, Behe argues that there is a very close analogy between some biological systems and human machines.⁴⁴⁸

⁴⁴⁴ Ratzsch 2010.

⁴⁴⁵ Behe 2006a, 218; Dembski 2002, 211n84; Dembski 1999, appendix. Meyer (2009, 383-386) also discusses Hume’s criticism of analogical arguments and responds that his design argument is not analogical, but an inference to the best explanation.

⁴⁴⁶ *Dialogues*, chapter II.

⁴⁴⁷ Dembski 2002, 211n84; Behe 2006a, 218. For one defence of the logic of analogical arguments in this vein, see Juthe 2005. See also McGrew 2004.

⁴⁴⁸ Behe 2006a, 218: “Incidentally, even by Hume’s criteria, the analogy between a watch and a living organism could be made very strong. Modern biochemists probably could make a watch, or a time-keeping device, out of biological materials – if not now, then certainly in the near future.” Behe is influenced by Denton 1986, 341, who argues that modern science has confirmed Paley’s idea that organisms contain machines. It should be noted that the existence of machines in

It seems possible to construct a theory of analogical arguments that is conducive to design arguments, though no general theory of these types of arguments has found general acceptance.⁴⁴⁹ Suppose that there is some clear connection between some property of nature (which we can call “design” or “design-likeness”) and intelligent design as a good, fitting explanation of this property. On this understanding of analogical arguments, the relevant similarity between objects in nature and machines lends probability to the conclusion of design, while differences relevant to the conclusion will undercut the argument.⁴⁵⁰ This understanding of the analogical arguments allows the defender of analogical design arguments to avoid Hume’s initial criticisms of the argument in the *Dialogues*. However, in defence of Hume, the *Dialogues* (part II) does contain a similar response from Cleanthes, the proponent of design arguments in the work. In response to the criticisms of analogical design arguments by Philo, Cleanthes argues that it is enough for the purposes of his argument that the cosmos resembles machines in the crucial respect of “adjustment of means to ends”.

Most of Philo’s criticisms of the analogical design argument come only after this adjustment of the initial scheme. For example, the argument that there may be multiple possible causes which could explain nature’s order remains relevant. The existence of causes other than intelligence which can explain the relevant aspects of nature is an empirical matter. Darwinian theory, for example, may well show a relevant difference between life and machines: life can evolve, because it is reproducing, while man-made machines cannot (at least so far) do so. As I will show in chapters 5 and 6, many argue that the progress of natural science makes the explanation of natural order in terms of intelligence unnecessary. The ID theorists also generally believe that some naturalistic explanations would indeed count against the design argument. The properties of living organisms which allow for Darwinian evolution to occur could be a relevant difference between machines and living organisms in the sense discussed, even if the logic of the inference would be valid otherwise.

So, in analogical arguments, it must be argued that the compared objects share a relevant property, and are not dissimilar in a way that is relevant for the explanation. Otherwise, analogies are merely fallacious arguments from similarity.

biological organisms does not mean that biological organisms are just machines. Denton (2004) criticizes the concept of organisms as machines while affirming that organisms contain machines.

Taken by itself, the newfound similarity of machines and some parts of organisms is not a sufficient response to Hume, however. There are still differences, and it could in principle be that “being designed” is also one of the features that makes human machinery different from organismal complexity, even if there are few other such features. It would be desirable to be also able to argue that similarity of a certain sort is somehow relevant to the conclusion: design just is a relevant type of explanation to consider for design-like order.

⁴⁴⁹ As Shaw and Ashley (1983) emphasize.

⁴⁵⁰ Juthe 2005.

Inductive Arguments

Design arguments can also be described as inductive arguments, meaning generalizations based on our past experience. The underlying principle of inductive reasoning can summarised as follows: *"If a large number of As have been observed under a variety of conditions, and if all those observed As without exception have possessed the property b, then all As possess the property b."*⁴⁵¹ The analogical arguments described previously actually make heavy use of the logic of induction. Indeed these could be accurately called inductive analogies: the conclusion of design is based on our experience of how certain, highly analogous properties are generated and the presence of these properties in both human artefacts and nature.

Dembski and Behe have both also explicitly referred to induction. Dembski writes that connecting "specified complexity" with intelligence happens through *"a straightforward inductive argument: in every instance where the complexity-specification criterion attributes design and where the underlying causal story is known (i.e., where we are not just dealing with circumstantial evidence, but where, as it were, the video camera is running and any putative designer would be caught red-handed), it turns out design is actually present."*⁴⁵² Dawes argues that Dembski is making an inductive argument for design of the following form:

5. Every observed instance of specified complexity that we can trace back to its origin is explained by the acts of some intelligent agent who brought it about.

Therefore:

6. Every instance of specified complexity is explained by the acts of some intelligent agent who brought it about.⁴⁵³

Kenneth Himma has argued that such inductive arguments for design are implausible, since no human could have brought about the specified complexity observed in nature.⁴⁵⁴ However, the inference doesn't refer to human designers specifically, but only the general category of designers. It is thought that the relevant property which explains specified complexity is not a characteristic that must in principle be unique to the species *Homo Sapiens*. Rather, the argument assumes that we can imagine the existence of a non-human intelligent designer, who has the kind of properties which we inductively know are needed to explain this type of complexity.

Responding to Himma, Dawes argues that the argument is very similar to commonly used inductive arguments. So, if we accept inductive reasoning in general and we accept the truth of the premises, the inductive design argument does succeed in establishing some

⁴⁵¹ Chalmers 1982, 13.

⁴⁵² Dembski 2002a, 25.

⁴⁵³ Dawes 2007, 76-77.

⁴⁵⁴ Himma 2005, 12.

plausibility for design as an explanation. The greater problem for the argument is that other explanations for the existence of specified complexity have also been proposed. So, as with analogical arguments, it seems that reference to Darwinian evolutionary mechanisms provide the best basis for critiques of inductive design arguments.⁴⁵⁵

As is evident from the quote about the “straightforward inductive argument”, Dembski indeed formulates his positive case for design as an inductive argument. However, this is not Dembski’s entire argument. As I will show in chapter 4.5, Dembski has formulated a methodology to eliminate natural explanations for specified complexity. Dembski argues that the property of specified complexity can be identified using statistical methods, and then inferred as designed through a process of elimination and induction. He also provides conceptual arguments for linking design and specified complexity.⁴⁵⁶

Elliott Sober has argued that Behe’s design argument is inductive.⁴⁵⁷ In the Dover trial, Behe indeed sometimes expressed his argument in these terms:

I testified that the intelligent design argument is an induction, not an analogy. Inductions do not depend on the degree of similarity of examples within the induction. Examples only have to share one or a subset of relevant properties. For example, the induction that, *ceteris paribus*, black objects become warm in the sunlight holds for a wide range of dissimilar objects. A black automobile and a black rock become warm in the sunlight, even though they have many dissimilarities. The induction holds because they share a similar relevant property, their blackness. The induction that many fragments rushing away from each other indicates a past explosion holds for both firecrackers and the universe (in the Big Bang theory), even though firecrackers and the universe have many, many dissimilarities. Cellular machines and machines in our everyday world share a relevant property – their functional complexity, born of a purposeful arrangement of parts – so inductive conclusions to design can be drawn on the basis of that shared property. To call an induction into doubt one has to show that dissimilarities make a relevant difference to the property one wishes to explain.⁴⁵⁸

In this long quotation, Behe again emphasizes that the design argument involves a comparison of the relevant properties of different objects. The basic principles underlying the argument are clear. The same kinds of properties are argued to have the same kinds of causes, based on our knowledge of these properties. But in contrast to his argument in Darwin’s Black Box, here Behe does not call the argument an analogy, but an induction. One problem with identifying Behe’s argument as either an analogy or induction is that is that Behe provides several different formulations of the design arguments, including analogy, induction and inference to the best explanation. Rather than relying on Behe’s own terminology alone, it should be asked what type of logical structure best captures the ideas of Behe’s inference. And one idea that is not present in the inductive formulation is the

⁴⁵⁵ Dawes 2007, 76-78.

⁴⁵⁶ Dawes 2007, 78.

⁴⁵⁷ Sober 2008, 168n37.

⁴⁵⁸ Behe 2006c, 89-90.

comparative nature of the inference. Earlier in the same article, Behe writes that “a theory succeeds by explaining the data better than competing ideas.”⁴⁵⁹ This is the sort of language that fits better with understanding the design argument as an inference to the best explanation, as I will argue in chapter 4.4. But this inference to the best explanation is supported by inductive knowledge which is argued to link certain kinds of effects with certain kinds of causes, and rule other kinds of causes out.

Hume did not think inductive design arguments could succeed. In his broader work, Hume criticized the reliability of inductive reasoning in general.⁴⁶⁰ However, in the *Dialogues*, Philo admits the possibility of inductive reasoning in general, but argues against the possibility of inductive design arguments. His claim is that we can only identify objects like watches as designed because we have collectively observed humans creating watches so many times. However, this method is not suited for gaining knowledge about the origin of life or the origin of the cosmos, since we were not present to observe the creation. Even if we had been present, we would only have a sample size of one, much too small for an inductive argument. To establish an inductive link between universes and design as a cause, we would need to observe several universes being created by a designer. So, inductive design arguments are in practice impossible.⁴⁶¹

The ID movement’s can respond to this critique of inductive design arguments by arguing that we can still have inductive knowledge about the types of properties that are commonly linked with design. When we find such properties in biology, this is argued to justify belief in design. However, there are also other ways of responding to Hume. The idea that causes can only be identified by observing the constant conjunction of cause and effect has been questioned after Hume’s time, because this seems to rest on a very narrow conception of what justified inferences are.⁴⁶² Today, induction based on repeated observation is generally not understood to be the only valid way of inference even in the natural sciences. Theories of cosmic evolution such as the big bang can be well supported by the evidence, even though we have never observed anything like the big bang.⁴⁶³ This leads to the possibility of the design argument as an inference to the best explanation.

Hume’s criticisms also rest on his own peculiar notion of causation, which not all philosophers agree with.⁴⁶⁴ Feser argues that in Hume’s notion of causation, cause and effect seem to be linked only accidentally. Under Hume’s notion, we can only identify a cause by

⁴⁵⁹ Behe 2006c, 82.

⁴⁶⁰ See Dawes 2009, 103.

⁴⁶¹ *Dialogues*, Part I.

⁴⁶² We could also observe that when we perform an inductive inference and add up the evidence of our observation, no two observations are typically exactly alike. Rather, they are at best very similar or analogical. Could we then say that induction in some sense depends on our ability to see analogies between different situations?

⁴⁶³ Big Bang theory could be an inference to the best explanation (IBE), for example. For more on IBE’s, see section 4.4 below.

⁴⁶⁴ Ratzsch 2010.

observing the constant conjunction of cause and effect.⁴⁶⁵ But perhaps we could also look at the nature of the cause to determine why it had this or that effect, for example, and this could help us when trying to discover the cause of some new phenomena. Based on this understanding, a cause could be discovered by understanding the nature of the cause and the nature of effect, rather than just through observing a statistical correlation between some objects. This could allow for analogies based on relevant similarities to make the design inference a possible explanation.

As Ratzsch argues, the intuition behind design arguments is not just that certain properties (termed R's by Ratzsch) of nature are constantly conjoined with intelligent design, and that this inductively observed connection allows us to explain these properties by reference to the intelligent operation of a mind. Rather, it is that *"the appropriate Rs in question were in their own right directly reflective of and redolent of cognition, that this directly suggested mind, that we could see nearly directly that they were the general sort of thing that a mind might or even would generate, and that consequently they did not depend for their evidential force upon previously established constant conjunctions or other associations with known instances of design."*⁴⁶⁶ Ratzsch argues that a written text, for example, says "mind" to us in a way not related to analogy or induction based on past experience. For many people, the order of nature speaks of the existence of a designer in just this way. So perhaps the design argument does not need to be based on an inductive generalisation, but on such a rational intuition.

Ratzsch and Graham Oppy have argued that William Paley, too, actually intended his argument to be simply an application of this rational intuition to the study of nature, not an analogical argument. The watch analogy was meant only to illustrate our typical way of detecting design.⁴⁶⁷ The ID movement also often uses analogies simply to illustrate the detection of design, not as analogical arguments. For example, Behe argues that *"just as in the everyday world we immediately conclude design when we see a complex, interactive system such as a mousetrap, there is no reason to withhold the same conclusion from interactive molecular systems."*⁴⁶⁸ This is clearly not an analogy where we conclude the designedness of life's molecular systems based on the previously known designedness of man-made interactive systems. Rather, in this quote Behe is arguing that the same properties lead us to the design inference in both cases.⁴⁶⁹

⁴⁶⁵ Feser 2009.

⁴⁶⁶ Ratzsch 2010.

⁴⁶⁷ A strong case can be made that Paley's argument was indeed not an analogical argument, but was just an example illustrating the design inference. Paley says explicitly that the watches design could be detected without prior experience of watches. See Ratzsch 2010 and Oppy 2002. However, I concur with Schupbach (2005) that Paley's argument was an inference to the best explanation, not a deduction.

⁴⁶⁸ Behe 1997a.

⁴⁶⁹ Oppy (2006, 188-190) argues that formulations like this show Behe's argument to be a deduction, but it seems to me that what Behe is saying here is merely that the design inference happens automatically when we observe certain properties. This is related to the intuitiveness of the design inference, and does not show how Behe would formulate the design argument in writing. As I have noted, Behe's *Darwin's Black Box* contains many formulations of the design argument. Another example of the analogical argument mentioned above is as follows: *"the irreducibly complex Rube Goldberg machines required an intelligent designer to produce it; therefore the irreducibly complex*

So, in the ID literature, I find that both this type of rational intuition and the inductive generalisation are used to support design arguments. It is argued that some things exhibit properties which are linked to intelligent design as a cause both by our rational intuitions and our inductive experience of how such properties are created. I will now consider this issue in more detail.

4.3. The Design Connection

Arguments for a Design Connection

A central finding of my analysis of analogical and inductive design arguments is that they rely on a connection between design as an explanation and the property to be explained. Design must in some way be an especially apt and sense-making explanation of just the particular kind of order we find in nature. As mentioned, the existence of a connection can be argued for based on inductive observation. However, it can also be argued to exist on the conceptual level, known through our rational intuitions and rational consideration of the nature of the cause and effect. I will now present some further examples of these inductive and conceptual arguments.

Induction involves observing the connection in a sample of test cases, and then extending the generalization to objects that belong to the same class. Here, the ID theorists' argument is that our experience shows a correlation between intelligence and some property. In addition to the examples from Dembski and Behe, this argument is also present in Meyer's work. He argues that "*undirected materialistic causes have not demonstrated the capacity to generate significant amounts of specified information. At the same time, conscious intelligence has repeatedly shown itself capable of producing such information.*"⁴⁷⁰ Meyer uses this argument to demonstrate the causal adequacy of intelligent design in explaining information.⁴⁷¹

The Discovery Institute's definition of Intelligent Design I quoted in the introduction also conceives of the connection in inductive terms. According to the definition, research on design "*is conducted by observing the types of information produced when intelligent agents act. Scientists then seek to find objects which have those same types of informational properties which we commonly know come from intelligence.*"⁴⁷² So, based on our experience of how certain "informational properties" are produced, it is argued that the same type of explanation can also be used outside the context of human activity.

blood-clotting system required a designer also." (Behe 2006a, 218). Here Behe's argument is clearly based on our previous knowledge of how such systems originate and the presence of similar (according to Behe, even the same) properties in biology.

⁴⁷⁰ Meyer 2010, 341.

⁴⁷¹ However, for Meyer, the design argument is not an analogy, but an inference to the best explanation. See chapter 4.4.

⁴⁷² Discovery Institute 2011.

At the same time, the ID literature also contains critiques of this inductive argument for connecting design and certain properties.⁴⁷³ First, it seems that induction cannot be the only possible way of gaining knowledge about intelligence. Dembski argues that we must have been able to see evidence of intelligence at some point without having prior experience of it. If we can only find evidence of design based on our prior experience of design, then how was this prior experience gained? At some point, we must gain evidence of design through some other way than induction. There must be some feature of the world which is evidence of design in itself. For Dembski, teleology and specified complexity are such features.⁴⁷⁴ Design is an *“inherently teleological”* process, thus it is able to explain teleological patterns.⁴⁷⁵ Here using design as an explanation is not based on induction, but on the understanding of the natures of cause and effect.

Second, it is argued that we need a way to differentiate between different things human beings produce. Not all we produce is equally a product of intelligent design, but the method of mere statistical correlation does not allow us to distinguish between various things produced by humans. We might accidentally break vines in a forest, or we might designedly form a trap from these vines. Though both are equally the product of humans, only one provides evidence of design. According to Behe, *“we know that all these things were designed because of the ordering of independent components to achieve some end.”*⁴⁷⁶ So, observing that humans create something is not sufficient infer that such things must be the products of design. Rather, we must also understand the properties of these things and the properties of human intelligence to know why such properties are evidence of design.⁴⁷⁷

In these arguments, the rational nature of specified complexity and the purposeful, irreducible complexity of organisms are seen to be reliable evidence of design, which we even use to identify human design. The rationality of explaining teleology by teleology is not based on just an inductive generalization, but a connection between the essential features of designing agents and these types of order. This is a link based on the understood nature of the cause and the effect, rather than just on an empirical correlation between them. It could be that the conceptual link is believed because of rational intuitions that our cognitive capacities tend to produce – recall the arguments of chapter 4.1. However, it could also be that that we learn to understand the existence of such a conceptual link between design and some property only based on our subjective experience of the human capacities that are

⁴⁷³ These also apply to the Humean account where design is detected by observing the constant conjunction of cause and effect. (See chapter 4.2 and Ratzsch 2010)

⁴⁷⁴ Dembski even argues that we detect our own intelligence through observing specified complexity. Of course, we don't intuitively use the term “specified complexity”, but Dembski claims that we nevertheless use the methodology Dembski describes. (Dembski 2004, chapter 32)

⁴⁷⁵ Dembski & Wells 2007, glossary.

⁴⁷⁶ Behe 2006a, 196. See also Dembski 2004b, 228–229; Behe 2000b, 7.

⁴⁷⁷ Again, this is seen in the way Behe's definition of “design” as a pattern in nature is “purposeful arrangement of parts”. For Behe, the cause of such apparently purposeful arrangements must possess the capability to act purposefully, arranging parts with a purpose in mind. A process without the capabilities of minds is, for Behe, a very improbable explanation in comparison. (Behe 2006a, 193.) I will analyse Behe's biological arguments in more detail in chapter 6.

needed create new artefacts. The inductive argument for design would be strengthened by appealing more clearly to our own subjective experience of what it is like to be an intelligent designer. This is seen sometimes in the ID literature, such as when Dembski writes that “*Intelligent Design is one intelligence determining what another intelligence has done.*”⁴⁷⁸

The Significance of the Connection

Ratzsch also presents a serious problem with the inductive establishment of the connection between design-likeness and design. All cases of design-likeness whose origins we can investigate are human artefacts, while the majority of design-likeness resides in natural objects, whose origins cannot be directly investigated. Thus the generalization is being made based on a small sample and extended into a different category. According to Ratzsch, this should at least lower the probability of the conclusion of design, though it does not entirely remove the value of induction.⁴⁷⁹

Ratzsch’s point is important and shows that the possibility for other explanations of design-likeness cannot be dismissed. However, the goal of making a “design connection” is simply to show that design is in some way a non-frivolous explanation for certain types of order. To have explanatory power, design must be at least better than an appeal to chance, the null hypothesis. So if such inductive arguments can give design as an explanation even the modest probability described by Ratzsch, they will have served their purpose. I am inclined to agree that the inductive arguments from human experience make the appeals to design much less frivolous than they would otherwise be. Even with just the inductive connection, design arguments are not explaining just random features of nature with ad hoc -hypotheses, but features which we know to require design in the case of human artefacts. The explanation is made even less ad hoc if we also think (perhaps based on our natural intuitions or experiential knowledge of the creation of artifacts) that there is a conceptual link between certain properties found in nature and design as a cause.

As I will argue in chapters 5 and 6, most participants of the debate don’t deny the design-likeness of nature, or the triggering of our agency detection device. It seems to me that best line of response from a critic of design arguments should not deny the connection

⁴⁷⁸ Dembski 1998c, 19. I find that Intelligent Design’s inductive arguments for linking purposeful complexity and intelligent design repeat the basic points already made in Paley’s *Natural Theology*, expanded and spiced with the terms of modern biology and information science. Speaking of “contrivance” meaning the purposeful structure of machines and organisms, Paley writes:

“Wherever we see marks of contrivance, we are led for its cause to an intelligent author. And this transition of the understanding is founded upon uniform experience. We see intelligence constantly contriving; that is we see intelligence constantly producing effects, marked and distinguished by certain properties – not certain particular properties, but by a kind and class of properties, such as relation to an end, relation of parts to one another and to a common purpose. – – We conclude that the works of nature proceed from intelligence and design; because in the properties of relation to a purpose, subservience to a use, they resemble what intelligence and design are constantly producing, and what nothing except intelligence and design ever produce at all.” (Paley 2006 [1802], chapter XXIII: “Of the Personality of the Deity.”)

⁴⁷⁹ Ratzsch 2010.

between design-likeness and design altogether. Rather, the critic simply can argue that the connection does not establish the conclusion in a necessary way. We can also imagine that design-likeness can be created without design, and so perhaps in some case (such as biological evolution) the non-purposeful explanation will be superior to the design-based explanation. I already presented this critique in analysing the traditional design arguments in chapter 4.1.

It can be argued that other factors besides design-likeness strongly influence our conclusions about design in the context of humans. For example, when something is already known to be the product of humans, then its properties may be clearer evidence that it has also been intentionally designed. Oppy and Ratzsch have argued that our recognition of human design works in this way. We recognize its artefactuality by signs other than its purposeful complexity. Ratzsch argues that artefactuality is our most important sign of the activity of humans, rather than natural laws and mechanisms. However, in the context of artefactuality, there are several signs which further signal that an object has been intentionally designed. Through our knowledge of humans, we know that the creation of these properties takes time, effort and intelligent design.⁴⁸⁰

Within Ratzsch's model, however, properties which are evidence of design in the context of artefactuality can also be at least weak evidence of design outside the human context.⁴⁸¹ Ratzsch calls these properties "bridge properties" and uses thought experiments to argue for the possibility that they could be evidence of design.⁴⁸² In Ratzsch's argument, the property of "mind correlativity" refers to patterns in nature which appear somehow rational to the human mind, apparent goal-directedness being a part of mind correlativity.⁴⁸³ "Mind affinity" is a yet stronger version of mind correlativity, where the rationality of some pattern appears particularly deep to us. Ratzsch's examples of texts fall into this category.⁴⁸⁴ There are several different ways of explaining this mind correlativity and teleology, as seen in chapter 3.3. Nevertheless, under this understanding design does remain at least a better explanation than the null hypothesis (random chance) and it could in principle be possible for design to be the best explanation.

The possibility of natural explanations shows that there is no deductively certain way to reason from mere design-like properties to the existence of a designer. Rather, the credibility of different explanations will have to be weighted on a case-by-case basis. In some cases (at least in the case of objects we know to be artefacts created by humans), design may be the better explanation for design-like properties, and as certain as possible for us finite creatures. In other cases, perhaps naturalistic explanations are more credible. Because of the comparative nature of the design inference, the inference to the best explanation seems to be the best way of formulating the argument.

⁴⁸⁰ Ratzsch 2001, chapter 1.

⁴⁸¹ Ratzsch 2001, 58; Oppy 2006, chapter 4.

⁴⁸² I will have more to say about these thought experiments in chapter 7.2.

⁴⁸³ Ratzsch 2001, 23.

⁴⁸⁴ Ratzsch 2001, 63.

4.4. Inference to the Best Explanation

The Design Argument as an IBE

In recent decades, the inference to the best explanation has emerged as one of the most promising ways to formulate the logic of scientific arguments.⁴⁸⁵ The basic logic behind the inference to the best explanation (IBE) is generally thought to be “abductive” as described by C.S. Peirce.⁴⁸⁶ The idea of abductive reasoning is that if our empirical evidence would be a reasonably expectable occurrence given the truth of some hypothesis, then this gives us evidence in favour of this hypothesis.⁴⁸⁷ Peirce formulates this logic as follows:

7. The surprising fact C is observed.
8. But if A were true, C would follow as a matter of course.
9. Hence, there is reason to suspect that A is true.⁴⁸⁸

Many believe that this is the basic form of inference which underlies many forms of science, Darwinian evolutionary theory being one standard example.⁴⁸⁹ For example, if all animals have a common ancestor, then we would expect them to have biological similarities. Biological similarities exist, so we have grounds for believing the hypothesis of common descent. This kind of abductive reasoning can fail, because the same evidence can fit several different hypotheses. In practice abductive explanations (hypotheses) are evaluated based on several different criteria such as enhanced likelihood, explanatory power and scope, causal adequacy, plausibility, evidential support, fit with already accepted theories, predictiveness, fruitfulness, precision, unifying power and the like. If one explanation emerges as superior in this comparison, we are justified in accepting it as the right explanation, until a better one emerges. Because the exact criteria and their application are controversial, deciding on the best explanation is a process dependent on background beliefs and subjective considerations.⁴⁹⁰

The history of science knows many examples where the same data could be explained by several models. In Galileo Galilei’s time, the Earth-centric cosmology of Tycho Brahe was able to explain the same data as the heliocentric cosmology of Copernicus and Galileo. However, over time the situation has changed in favour of the heliocentric model of the solar system. This feature of inferences to the best explanation is known as explanatory

⁴⁸⁵ Lipton 2003.

⁴⁸⁶ Peirce 1955, 151. Quoted in Ratzsch 2010.

⁴⁸⁷ Ratzsch 2010.

⁴⁸⁸ Peirce 1955, 151. I am following the arguments from Ratzsch 2010 and Dawes 2009, 20-23.

⁴⁸⁹ See Banner 1990, 125-130. For more on the general logic of inferences to the best explanation, see Lipton 2003.

⁴⁹⁰ Ratzsch 2010.

underdetermination.⁴⁹¹ The ID theorists' claim that the design argument does not reveal the identity of the designer can also be stated in terms of underdetermination: the same data can be explained based on a wide variety of different design hypotheses. For example, perhaps the designer could be a Platonistic demiurge, a space alien or Zeus instead of the God of the Bible.⁴⁹²

Within the ID movement, Meyer explicitly refers to his argument primarily as an inference to the best explanation (IBE), whereas Behe makes several different formulations of the argument. However, the probabilistic nature of Behe's argument makes seeing it as an inference to the best explanation credible. As I will show in chapter 6.1, Behe argues that the probability of the design conclusion varies based on the properties of the natural systems under analysis. The more complex and purposeful the order appears, the more certain our conclusion of design becomes for him.⁴⁹³ He compares the likelihood of design and natural explanations and argues that our background religious and non-religious beliefs effect our assessment of the probability of the conclusion.⁴⁹⁴ He further argues that the presence of consilience, several independent lines of argument leading to the same conclusion, lends more probability to the design argument.⁴⁹⁵ These are features of inferences to the best explanation.⁴⁹⁶

Ratzsch formulates the design argument as an inference to the best explanation (IBE) as follows. Here the first premise is related to Pierce's premise that "the surprising fact C is observed" and the second premise is the hypothesis which explains this datum. After comparison with alternative explanation, it is concluded that the design hypothesis is the best explanation and probably true.

10. Some things in nature (or nature itself, the cosmos) exhibit exquisite complexity, delicate adjustment of means to ends (and other relevant *R* characteristics).
11. The hypothesis that those characteristics are products of deliberate, intentional design (Design Hypothesis) would adequately explain them.
12. In fact, the hypothesis that those characteristics are products of deliberate, intentional design (Design Hypothesis) is the best available overall explanation of them.

⁴⁹¹ Lindberg 2003.

⁴⁹² For example, John Leslie (1989) and Michael Denton (1998) have advocated such non-traditional design hypotheses. See Ratzsch 2001, 81-82 for some ideas about the concept of underdetermination in relation to design arguments.

⁴⁹³ Behe 2006a, 256.

⁴⁹⁴ Behe 2001.

⁴⁹⁵ Behe 2007, chapter 10.

⁴⁹⁶ Paley's design argument can also be stated as an inference to the best explanation. Schupbach (2005), responding to Oppy (2002) argues that Paley even intended his argument as an inference to the best explanation, while Oppy (2006) continues to argue that it is a deduction, but acknowledges the possibility of other interpretations. I am inclined to agree with Schupbach.

Therefore (probably):

13. Some things in nature (or nature itself, the cosmos) are products of deliberate, intentional design (i.e., the Design Hypothesis is likely true).

The conclusion (13) is not always included in formulations of the inference to the best explanation. It simply states the common belief if some explanation is the best, then we have grounds for believing that it is also probably true, not just the best currently available explanation. This may not always be true. If all considered explanations are not very convincing and the best explanation is only slightly better than the rest, then we may still not have grounds for believing that it is true. However, assuming that the criteria for selecting the best explanation are conducive to truth – that is, assuming the reliability of our rational intuitions concerning explanations and the philosophy of explanations – it seems that often we are at least rationally justified in accepting the best explanation as probably true. However, it is not always clear what exactly makes one of the hypotheses so much better than the others that such confidence is warranted.⁴⁹⁷

Related to this, Peter Lipton makes the distinction between potential and actual explanations. A potential explanation is one that entails the data in some way; an actual explanation is simply a true potential explanation. Different criteria can then be used to try to identify the most likely actual explanation from the pool of potential explanations we have available.⁴⁹⁸ In the case of “design-like” objects in nature, potential explanations could include evolutionary explanations, design-based explanations, explaining the apparent rationality as an illusion created by our minds and so on. However, if design is at least a potential explanation – if it has explanatory force – then this comparison could in principle lead to the result that design is the best explanation.

Critiques of the Design Argument as an IBE

In the preceding formulation of the argument, premises 11 and 12 are the crucial controversial premises of the argument. As Gregory Dawes argues, there are two alternative lines of critique which can be made of any abductive theistic explanation. First (1), it can be argued (against premise 11) that theistic explanations actually don't explain at all, meaning that they are not part of the pool of potential explanations. Divine action or (in the case of the ID movement) the actions of an unidentified intelligent designer do not show why we should expect to observe the data. This is an “in principle” objection to design arguments. No matter what the universe looks like empirically, design cannot explain it. This means that

⁴⁹⁷ Dawes 2009, chapter 6.

⁴⁹⁸ Lipton 2004, 56-66. For Lipton, the inference to the best explanation is indeed concerned with finding reasons to believe in some hypothesis. However, it is also possible to interpret the inference to the best explanation as merely a heuristic method for comparing hypotheses that will then have to be confirmed using some other methodology. (Iranzo 2007, 340-341.)

there is no conceivable evidence that could speak in favour of design – a very strong conclusion. According to Dawes, the more promising critique of the argument is a “de facto” critique based on the competition between different potential explanations of the same data. This critique is targeted at premise 12 – the comparison of explanations. Though theistic explanations and design could in principle explain natural order, in practice naturalistic explanations like Darwinian evolutionary theory can be argued to work better and thus make design an unnecessary explanation.⁴⁹⁹ So, even if design is a potential explanation of the data, it can still be argued that it is not a very good explanation, and this is relevant for assessing the credibility of premise 12. Indeed, in the discussion on Intelligent Design, critiques of the explanatory power of design are common.

Common critiques concern the lack of independent support and frivolous nature of design hypotheses. Elliott Sober has illustrated the difficulties facing design arguments with an interesting parable. Suppose that we hear a strange sort of rumbling from the basement. We could argue that the hypothesis “the noise is caused by a bunch of trolls bowling” explains the noise quite well, as it predicts the observed empirical evidence. This is causally sufficient explanation involving designers, but it does not feel quite satisfactory.⁵⁰⁰

Two related difficulties help understand the unsatisfactory nature of the troll hypothesis. First (1), we do not have any independent reasons for believing in trolls, which means that the prior probability of the troll hypothesis is very low. We will rather hold out for a more reasonable explanation than accept something this strange. Even though the evidence increases the probability of the troll hypothesis, it is not sufficient to raise the probability into the realm of credibility, since the beginning probability is so low. Second (2), any data can be explained by a modified troll hypothesis, supposing that the trolls are postulated to have the motivation and adequate powers for producing the evidence we see. For example, supposing that cookies are missing from the cookie jar, we could hypothesize that an invisible troll ate them. This would explain the data, but it would be totally frivolous. The technical term for this frivolousness is that the troll hypothesis is *ad hoc* – a hypothesis artificially constructed just to explain this one piece of data, but which has no other grounds.⁵⁰¹

According to Sober, the design hypothesis for explaining the evolution of life also has a very low prior probability and suffers from the problem of frivolousness. What is needed for the design hypothesis to work is independent evidence of the existence of the designer and some plausible reason for supposing that the designer has the capabilities and the motivation

⁴⁹⁹ Dawes 2009, chapter 2.

⁵⁰⁰ Sober 1993, chapter 2.

⁵⁰¹ This is also related to what Phillip Kitcher (1981, 528) has called the problem of spurious unification – if a pattern of explanation could fit any state of affairs, it cannot explain why this particular state of affairs exists rather than some other state of affairs which would fit the hypothesis equally well. (See also the commentary in Dawes 2009, 43-46.) Similarly, Robert Pennock (1999, 275) argues that explanation in terms of a designer’s purposes is non-explanatory, because a designer’s purposes can conceivably be invoked to explain anything. For example, supposing that we want to ask a question about why apples fall down from trees, we could answer that it is because God wills it.

for producing the order we see in nature. This is the only way to avoid frivolous design hypotheses which can be invoked to “explain” anything at all, but which we nevertheless have no grounds for accepting. Interestingly, Sober’s remarks are directed also against David Hume’s critique of the design argument. According to Sober, the design argument as an inference to the best explanation can avoid most of the Humean critiques of design arguments. For example, it does not depend on the exactness of the analogy between the universe and a machine. But Sober’s conclusion is very Humean: we can reliably infer the presence of human design, but our inferences about supernatural design are far less certain.⁵⁰²

So, for a design argument to work, the reasoning behind premises 11 and 12 must be made as clear as possible. It must be specified what is required before a design hypothesis can possess explanatory power, and to assess how much evidential support this really gives to the design hypothesis in relation to other hypotheses. Here the strategies of theistic natural theologians and the ID theorists differ, though both employ the same logic of the inference to the best explanation. In order to bring out the core ideas of ID and relate them to theistic natural theology, I will first introduce one way of defending natural theology and then go on to discuss ID’s approach. The similarities and differences of the two schools of thought will become clearer in the coming chapters.

Differences Between Design Arguments

The arguments of theistic natural theology are different from the troll hypothesis because they are not just artificially constructed to explain one facet of reality. Rather, there is a cumulative case of many theistic arguments which support each other. If – as many argue – the explanatory dimensions of theistic belief are not the reason for its origination, then this seems to show that theism is not an *ad hoc* hypothesis invented to explain some small amount of data.⁵⁰³ Kenneth Himma has similarly argued that we are justified in making design inferences only in contexts where there is already strong independent reason to think that there exist intelligent agents with the ability to bring about the occurrence of the relevant entity, feature, or property. Only in such contexts, Himma argues, is there sufficient information to justify assigning a probability to the design hypothesis that is higher than the probability that we are presumably justified in assigning to the chance hypothesis.⁵⁰⁴

⁵⁰² Sober 2004. This type of conclusion is very common in the critique of ID. See Pennock 2001 and Hurd 2004 for other examples of the objection.

⁵⁰³ The non-explanatory origins of belief in God were discussed in chapter 2.5. Of course, it could be that the non-explanatory account is not correct. For example, if humans do have an intuitive tendency to explain nature teleologically (as discussed in chapter 4.1), then perhaps this is partly responsible for the origins of belief in God. If design arguments are just more rigorous statements of the logic of this intuition, then belief in God and the design arguments come at least partly from the same source.

⁵⁰⁴ Himma 2005, 1.

As Dawes notes, it is also not the case that just any data could be explained by reference to the theistic God. This is why theistic believers would find the existence of gratuitous evil in the world very puzzling. God is thought to have certain attributes which make some ideas about what God would do more reasonable than others. For example, because God is good, he is expected to create a good world. The arguments of theistic natural theology thus often depend on clear ideas about God's nature and motivations.⁵⁰⁵

It is nevertheless clear that such theistic explanations are quite different from any natural explanation based on lawful regularities. God is thought to be free and thus it is difficult to argue that any empirical result could be derived from the existence of God as a "matter of course". This difficulty doesn't seem fatal, however: the same seems to be true of all intentional explanations, even those used of humans. Though determinists believe that it is in theory possible to predict the behaviour of humans completely, in practice it is not. We can never be sure that another human being has the exact intention which will result in exactly this sort of behaviour, though we may have very good reasons to believe so. Theistic philosophers of religion argue that the same is true of personal explanations referencing the intentions of God. Though God is free in his actions, he does not act without reason. Thus some outcome can be reasonably expected of the theistic God. For the theistic hypothesis to have explanatory power, it seems that it is enough for it to make the evidence more likely than the chance hypothesis. Its explanatory power can then be measured by how great the difference between the theistic hypothesis and the chance hypothesis is.⁵⁰⁶

The ID movement's inference to the best explanation is different, though the following chapters will also show that there are some points where the ID movement comes closer to the theistic arguments.⁵⁰⁷ Typically ID's design arguments are stated without the support of a cumulative case of other theistic arguments and without appealing to such theistic presuppositions. As I argued in chapter 3.5, the ID theorists recognize that theistic background beliefs can make the design argument more credible, and that atheistic background assumptions can make it less credible. However, they also emphasize that the design argument can be convincing on its own, as long as the possibility of design is not dogmatically denied a priori. ID's design argument also leaves the question of the motives of

⁵⁰⁵ Dawes 2009, 43-46. I will look at some of these ideas in more detail in chapter five as I analyse theistic formulations of the fine-tuning design argument. The most influential defenders of theistic design arguments I will look at there are Robin Collins and Richard Swinburne. The idea of the high prior probability of theism is also crucial to Swinburne's argument. According to Swinburne (2004a, chapter 5), because theism attempts to explain the whole world, its prior probability cannot be evaluated in the light of any background evidence. Rather, the background probability of theism must be based purely on a priori considerations such as the simplicity of the hypothesis. Since Swinburne sees theism as a very simple hypothesis, he assigns it a relative high intrinsic probability of 0,5.

⁵⁰⁶ Dawes (2009, appendix) argues that intentional explanations are deductive, whereas Swinburne (2004a) sees them as probabilistic.

⁵⁰⁷ One way of doing this would be to construct ID as a theistic science starting from the presupposition that God exists. This would then supply the basic knowledge that a designer capable of creating life exists. The aim of ID's project would then be to determine whether signs of the divine intelligence can be seen in the order of nature, and whether God created life through evolution or through miracles surpassing the laws of nature.

the designer open.⁵⁰⁸ As I argued in chapter 4.3, certain types of “design-like” order are thought to be best explained by design even if we know nothing about the designer’s motivations beforehand.⁵⁰⁹

So, in the ID movement’s thought, the design argument does not need to predict what the designer would do. Rather, the argument simply posits that based on our experience, designers have the right sort of causal powers to explain certain types of order, and that this is sufficient to make design into a potential explanation. In chapter 3.3, I pointed out that in the philosophy of explanation, there has been a tendency to separate the concepts of predictive capability and explanatory power. This trend seems to work in favour of the possibility of design arguments like those of the ID movement. If there is some property which is conceptually linked to intelligent agency, then this could help make the design hypothesis far more intuitively plausible than any frivolous troll hypothesis. Sober’s thought experiment about trolls in the basement can be modified to show the importance of the connection. Suppose that the noise from the basement was not just some random rumbling, but was analogous to beautiful orchestra music. Then the hypothesis of design would seem to be the best explanation, even if we did not have independent evidence of a designer in the basement. The pattern in this case would arguably be enough to confirm the design hypothesis without additional evidence. Because of our background knowledge, the most reasonable possibility would be a human designer.

The Bayesian probability calculus can be used to further elucidate the differences between ID and natural theology. Bayesian logic allows for the calculation of the probability of the hypothesis given the evidence. The probability of the hypothesis depends on both the background probability of the hypothesis without the evidence, the background probability of the evidence, and the degree to which the hypothesis predicts the evidence.⁵¹⁰ Natural theologians assess all of these factors, but the Intelligent Design literature only directly addresses the background probability of the hypothesis without the evidence and argues that this surprising evidence is well explained on the hypothesis of design, but poorly explained without it. ID assumes that the background probability of the design hypothesis can even be very low, but it will still be confirmed by the data, since the data is so poorly explained without it. As long as the prior probability of the design hypothesis is not set to zero (in which case no conceivable evidence could confirm it), we can indeed imagine a body of evidence that would be sufficient to confirm the hypothesis. I will argue this further in chapter 7.3.⁵¹¹

⁵⁰⁸ In chapters 3.2. and 3.3., I argued that “intelligent design” used as explanation by the ID theorists nevertheless assumes that the designer has some purpose for creating. For this purpose, the designer then forms a plan, and arranges matter to fulfil this plan. Only the designer’s will to create a certain type of order is assumed, but nothing is said about his deeper motives.

⁵⁰⁹ For example, see Behe 2006a, 196.

⁵¹⁰ See Joyce (2003) and Howson & Urbach 2006 for more on Bayesianism.

⁵¹¹ The case has an interesting analogy in the discussion of the probability of Jesus’ resurrection. Richard Swinburne (2003) argues that the credibility of Jesus’ resurrection is highly dependent on having at least a moderate background probability for the existence of the kind of God who might reveal himself in history. In

Nevertheless, it may well be that the movement's argumentation suffers from not discussing the background probability of the design hypothesis more clearly. Helen De Cruz and Jonathan De Smedt have argued, it is plausible that different opinions about design are often influenced to a large degree by different background probabilities given to design because of different basic beliefs.⁵¹² In chapter 3.4, I have also argued that different philosophies of mind affect the argument. As Ratzsch argues, the background assumptions affecting evaluations of the argument are "*highly diverse and contentious*".⁵¹³ So, what does the ID literature have to say about the matter?

The Requirement of Independent Evidence and the Design Connection

As I argued in chapters 3.4 and 3.5, the Intelligent Design theorists do recognize the effects of background beliefs on evaluations of the design argument. The designedness of nature's order is clearly much more of a live possibility for theists than it is for naturalists. Nevertheless, the ID theorists emphasize that their design argument does not require background knowledge about the designer. Stephen C. Meyer has provided the most in-depth defence of this possibility within ID literature.

Meyer makes a distinction between the causal adequacy criterion and the causal existence criterion. The causal adequacy criterion simply means the causal powers of the supposed cause in relation to the data, whereas the causal existence criterion refers to independent evidence supporting the existence of this cause at the proper time. To refer back to Sober's example of the troll hypothesis, causal adequacy refers to the power of the trolls to cause the strange sound, and causal existence refers to the probability of the existence of trolls with these powers in the right place to cause the sound. Contrary to Sober, Meyer argues that it can be sufficient for the design argument to fulfil the causal adequacy condition. This can in turn demonstrate the existence of a designer at the right time, even without any further supporting evidence.⁵¹⁴

Meyer's argument for this conclusion is twofold. First (1), according to Meyer, causal adequacy is sufficient to establish the existence of the cause, if this cause is the only cause which is known to have the powers to explain the evidence. In this case, even a low prior probability will be enough to make the design hypothesis plausible, since it is far superior to its eliminated alternatives. This transforms the design argument into an inference to the only explanation and requires quite a stringent rejection of naturalistic explanations. This is problematic for Intelligent Design if its arguments do not succeed in completely eliminating

contrast to Swinburne, McGrew (2009) argues that the historical evidence favoring Jesus' resurrection is so strong that even a much smaller probability for the existence of this kind of God will suffice for the argument.

⁵¹² De Cruz & De Smedt 2010. Himma (2005) also argues that an evaluation of the prior probability of the hypothesis is important for the design argument.

⁵¹³ Ratzsch 2010.

⁵¹⁴ Meyer 2009, 166-168.

naturalistic explanation in the sense of removing all plausibility from them.⁵¹⁵ Here Meyer refers to discussion in the philosophy of science as support: many philosophers have indeed argued that if some type of cause is the only one known to be able to explain some type of phenomena, then finding such phenomena does typically constitute evidence of the existence of such a cause. For example, the finding of iridium at the K-T boundary worldwide provides evidence of an asteroid impact roughly 65 million years ago. So, using the causal adequacy criterion in this way is not without precedent.⁵¹⁶

Second, Meyer argues that design detection does not in practice require prior knowledge of the designer. For example, archaeologists can infer the existence of a previously unknown human civilization when they find the remains of a city, because human civilization is the only known cause which can explain the remains. The motives of the designers are only inferred after we have first detected their existence. The existence of extraterrestrial aliens could also in principle be inferred based on the discovery of some artefact on an alien planet or a signal in space, even if we had no previous knowledge of the existence of these aliens or their motivations.⁵¹⁷

I do not think the analogies of the meteor impacts and human design allow Meyer to wholly sidestep the causal existence criterion. Even if we had no prior evidence of a meteorite impact 65 million years ago, we could still give this kind of event a non-zero probability based on our general cosmological knowledge. In the case of human design, we similarly already have knowledge that humans live on our planet, and have lived for quite some time. So, in both cases, some estimate of the background probability of design can be made. At least on a Bayesian scheme, the background probability cannot be avoided.

Furthermore, Meyer's design argument also differs from these cases by the amount of details it can provide. We also often have a good idea of what designed objects are for and how they are made, as well as about the possible motivations of designers. We have much knowledge of humans and artefactual objects, which helps in making such design inferences. Critics of the design argument can claim that the lack of such detailed knowledge speaks against ID's design inference, because it has less predictive power and testability than inferences of human design. Even in Meyer's example of the detection of extraterrestrial alien intelligence, we do have at least an inkling of the possibility that such intelligences exist, and could perhaps form hypotheses about possible motives based on human comparisons.⁵¹⁸

Despite these criticisms, I think Meyer's basic usage of the causal adequacy criterion is sound, as long as the prior probability of the design hypothesis is not set to zero. If there is a design connection of the sort analysed in chapter 4.3, the design argument does not require knowledge of the designer's motivations. Rather, our knowledge of the nature of design as a cause, acquired through induction and rational intuitions, can help answer the charge that

⁵¹⁵ Meyer 2009, 381-383

⁵¹⁶ See Cleland 2011 for an overview of the history of this discussion.

⁵¹⁷ Meyer 2009, 381-383.

⁵¹⁸ For further discussion of such thought experiments, see chapter 7.3 of the present study.

design hypotheses are frivolous. Though a design hypothesis can in principle be formulated to explain any sort of affairs (designers are crafty creatures), it is plausible that there are some features (such as teleology) that design is a more fitting explanation for. So, in the Intelligent Design movement's formulation, the design argument is an inference to the best explanation that is supported by analogical and inductive arguments as well as rational intuitions about the nature of design as a cause. Whereas the arguments of theistic natural theology are based on a hypothesis both about the nature and the motivations of the deity, the ID movement's design argument is based only on a general knowledge of what designers are like and what sort of capabilities they have. The only motivation that is assumed of the designer is the motivation to create the observed order.⁵¹⁹

It could be argued that the requirement of independent evidence, taken to extremes, would make knowledge about any new kind of entities impossible. For example, suppose that physicists discover that a new type of matter is required to explain the properties of the observed universe. It would not be reasonable to argue that we cannot accept this theory, because we have not previously believed in the existence of this new kind of matter. John Leslie argues that even the existence of something as improbable as telepathy could in principle be demonstrated like this, even though we have no previous knowledge of it. Suppose that after creating a painting of the countryside, Jones tries to transmit the results to Smith by the mere power of thought. Behold, Smith is able to reproduce the painting in every detail. Suppose further that this happens many times and there is evidence against any cheating. Are we justified in rejecting the possibility of telepathy as an explanation just because we do not have previous evidence of it?⁵²⁰ Again, the evaluation of any purported instance of telepathy would indeed also depend on our background beliefs.

It seems reasonable to suppose that independent evidence of the designer would indeed help the design argument. However, what form this independent evidence could take? Intelligence cannot be observed directly. Rather, it seems that we only know our own intelligence through introspection and others through intuition or inference. So in practice all our evidence of the existence of some non-human intelligence would be indirect, and so it could be analysed by using the inference to the best explanation. Then the requirement of independent evidence translates to a request that the design hypothesis should also be the best explanation for independently discovered facts B, C and D, rather than just fact A. It should not just explain a small amount of data, but should be a conclusion based on many independent lines of evidence. But according to proponents of ID, this is just what the design hypothesis already does. The cosmic and biological arguments for design are collections of a vast variety of facts which are all thought to be explained by the same hypothesis of design. So the design argument is not alone after all – it is itself a cumulative case argument. Perhaps the cumulative evidence of design could in principle be so convincing that, like the above

⁵¹⁹ McGrew (2004) argues similarly that the general properties of the designer are in principle sufficient for a design argument.

⁵²⁰ Leslie 1989, 18.

example of music from the basement, it could provide a reason to believe in design without other supporting arguments. I will look at this possibility in more detail in chapter 7.3. As I will argue further in that chapter, this does not mean that our world necessarily contains evidence like this in actuality, but the logical possibility of this type of inference is nevertheless interesting.

In chapter 3.4, I argued against a priori criteria for excluding design inferences and in favour of using criteria that allow for design in principle. I argued that evaluating the evidence for these kinds of arguments is important. Here, in arguing against the independent evidence requirement as an absolute requirement, I am again coming to the same conclusion. However, just as in chapter 3.4, this conclusion does not mean the end of the discussion. A critic of ID's design arguments could well admit the possibility that we could have evidence of life's design, while denying that we actually have such evidence. Different design inferences could also exhibit different degrees of explanatory virtues.

4.5. Inference to the Only Explanation

I have argued that the inference to the best explanation is a promising way to formulate the design argument's logic. Often ID proponents go further than merely propose ID as the best explanation, however. It is also argued that ID is the only explanation for some things and that all remotely plausible competing hypotheses can be decisively eliminated. Building on the concept of the inference to the best explanation, Alexander Bird has defended an account of "inference to the only explanation" (IOE).⁵²¹ Bird's purpose is to develop the logic of the inference to the best explanation further so that it can give a stronger guarantee of the reliability of the hypothesis. Bird's development of the idea follows the logic of Sherlock Holmes: "*when you have eliminated the impossible, whatever remains, no matter how improbable, must be the truth.*"⁵²² It is important to note that according to Bird, not nearly all inferences even in natural science can be legitimately called inferences to the only explanation. The problem of underdetermination prevents this – often there will be several different explanations for the same data, and not all of them can be decisively eliminated. Showing other alternatives to be improbable is sufficient for rational belief and the use of the inference to the best explanation, but the inference to the only explanation requires more than improbability – it requires elimination.⁵²³ Again, in these types of inferences, the initial background probability of the hypothesis can be very low, as long as the hypothesis is strongly confirmed by the evidence, and all other explanations can be eliminated.

The ID theorists themselves have not used the term "inference to the only explanation" of their inference. However, this development of the inference to the best explanation does fit

⁵²¹ E.g. Bird 2005, 2007, 2010.

⁵²² Doyle 1892, "The Adventure of the Beryl Coronet".

⁵²³ Bird 2005, 26-28.

the way Behe, Meyer and Dembski argue. The emphasis on the ability to eliminate competitive explanations and the confidence in the reliability of the hypothesis are certainly present in their formulations of the design argument. In the previous chapter, we saw that because Meyer sees intelligent design as the only causally adequate explanation for certain types of order, he is able to bypass the requirement of independent evidence for the designer. This is in line with the Holmesian methodology: once you have eliminated the impossible, whatever remains must be the truth, even if it is highly improbable. However, within the Intelligent Design movement, William Dembski has emphasized the elimination of alternative explanations the most, even calling his methodology an “eliminative design inference” or the design filter, where design is inferred only after all other explanations have been eliminated. I will first introduce Dembski’s methodology, then consider some problems of these eliminative design arguments.

Dembski’s Eliminative Design Argument

Dembski’s argument is complex and multi-staged, construed as an eliminative argument where a pattern exhibiting “specified complexity” is seen as designed after finding reasonable grounds for eliminating chance and necessity (conincidences and law-like regularities) as plausible explanations.⁵²⁴ A short sequence of letters like “CAT” is specified but not complex – finding such a pattern written in Scrabble letters might still be explained as the coincidental result of pieces dropped randomly. A long sequence like “QNEDFJEFOIJKFEES...” is complex but not specified – it does not match a previously known pattern. A Shakespearean sonnet, on the other hand, is both complex and specified. Specified complexity like this is, for Dembski, a reliable sign of intelligent design and far too difficult to explain by referring to chance processes or the regularities of nature.

The argument could be formulated as follows in a simple deductive manner:

14. Some things in nature exhibit specified complexity.
15. Specified complexity is not producible without intelligent design.
16. Therefore, the specified complexity in nature is a product of intelligent design.

Dembski’s description of designed patterns as “specified complexity” and his arguments for the elimination of chance and necessity are the most original parts of Dembski’s project. Though his process for eliminating chance and design is complex, Dembski argues that this form of inference also underlies our intuitive reasoning about design – without it, we could

⁵²⁴ E.g. Dembski 1998a, Dembski 2002, Dembski 2004. Dembski’s definitions for chance and regularity are as follows: “To attribute an event to law is to say that the event will almost always happen given certain antecedent circumstances. To attribute an event to chance is to say that its occurrence is characterized by some (perhaps not fully specified) probability distribution according to which the event might equally well not have happened. To attribute an event to design is to say that it cannot plausibly be referred to either law or chance” (Dembski 1998c, 98).

not even infer that our family members have signs of intelligence.⁵²⁵ As we will see below, some critics have contested that Dembski's procedure is an accurate description of how we detect design. But the validity of the process for detecting design can be evaluated regardless of whether it is the procedure we typically use. The following quote illustrates the complex nature of Dembski's argument:

- a. A subject S learns that an event E has occurred.
- b. By examining the circumstances under which E occurred, S finds that a chance process characterized by the chance hypothesis H and the probability measure P could have been operating to produce E.
- c. S identifies a pattern D that delimits the event E.
- d. S calculates the probability of the event D* given the chance hypothesis H, that is $P(D^* | H) = P$
- e. In accord with how important it is for S to avoid a "false positive" (i.e. attributing E to something other than the chance hypothesis H in case H actually was responsible for E), S fixes a set of probabilistic resources Ω characterizing the relevant ways D* (and by implication E) might have occurred and been specified given the chance hypothesis H.
- f. Using the probabilistic resources Ω , S identifies the saturated event $D^* \Omega$ and calculates (or approximates) the associated saturated probability $P \Omega (= P(D^* \Omega | H))$
- g. S finds that the saturated probability $P \Omega$ is sufficiently small.
- h. S identifies side information I and confirms that I satisfies the conditional independence condition, that is, that for any subinformation J generated by I, J is conditionally independent of E given H, that is, $P(E | H \& J) = P(E | H)$.
- i. With respect to a bounded complexity measure $\Phi (= \phi, \lambda)$ that characterizes S's problem-solving capacity, S confirms that D and I together satisfy the tractability condition, that is, that the problem of formulating the pattern D from the side information I is tractable, or equivalently, $\Phi(D | I) < \lambda$.
- j. S is warranted in inferring that E did not occur according to the chance hypothesis H.⁵²⁶

Dembski's method for eliminating chance as an explanation is based on the statistical methods developed by mathematician Ronald A. Fisher (1890 - 1962). Fisher uses a statistical approach for testing hypotheses. If the observed measurements are far from what would be expected based on a random distribution (i.e. they lie in the "rejection region"), then the chance hypothesis can be discarded. Dembski argues that if some improbable event also has a clear pattern, which Dembski elsewhere calls a "specification", then the chance hypothesis can be eliminated, as in Fisher's statistical analysis.⁵²⁷

⁵²⁵ Dembski 2003, chapter 32.

⁵²⁶ Dembski 1998a, 167-174.

⁵²⁷ E.g. Dembski 2005, 12-13: "specifications are patterns delineating events of small probability whose occurrence cannot reasonably be attributed to chance." Specified complexity, for Dembski, can also be characterized as having low descriptive complexity while having high probabilistic complexity. Dembski also links the concept to mathematical "Kolmogorov complexity". (Dembski 2008, 168-169.)

For Dembski, all complex patterns are also defined as highly improbable, and improbability in itself is thus not evidence of design. For instance, the precise arrangement of the grains of sand on any given beach is extremely improbable given the chance hypothesis, as is any combination of cards in a poker game. However, this improbability in itself does not give evidence of design. Rather, it is only when some highly improbable order matches an independently specifiable, easily describable pattern, that we can be justified in eliminating the chance hypothesis.⁵²⁸

In Dembski's schema, just how much improbability the eliminative argument requires depends on what we think the "probabilistic resources" available to generate the pattern without design are, and how certain we want to be before eliminating chance. Not all examples of specified complexity we observe must be due to design, because the probabilistic resources must also be considered. In poker, a straight flush is a specification, but a player can get a straight flush without cheating. However, a player who always gets a straight flush will be considered a cheater, because this is so extremely improbable (complex) and the outcome is specified. Dembski himself formulates an "universal probability bound", meaning the amount of specified complexity that he argues is impossible to produce by chance, given the limited temporal history and finiteness of the universe. This is calculated by multiplying the amount of atoms in the observable universe, the amount of maximum physical interactions that can occur in a second, and a billion times the age of the universe in seconds. The resulting number (10^{-150}) is fantastically large, and according to Dembski, we usually will not need to set the universal probability bound this high before we can eliminate chance-based explanations. In practice he argues even smaller amounts of specified complexity (such as multiple straight flushes) can be justifiably seen as designed.⁵²⁹

Fisher argued that the rejection region must be specified in advance of the experiments, in order to avoid cherry-picking the data or what Dembski calls "fabrications": the imposing of a pattern upon truly random data. In contrast to this, Dembski argues that the concept of a specification allows us to also specify a "rejection region" after the pattern has been observed. The conditional independence condition and the tractability condition, discussed in steps *h* and *i* of the above formulation, are meant to ensure that the pattern is not just a fabrication, but a true specification.⁵³⁰

⁵²⁸ Dembski & Wells 2008, 168-169.

⁵²⁹ Dembski 1998a, 167-174. Elsberry (2007, 285) criticizes Dembski's inability to define the precise point where we can use the criterion of specified complexity as a reliable marker of intelligent agency. I don't think the difficulty is serious – Dembski does state that we can set this based on how confident we want to be of the conclusion of Intelligent Design. The other difficulties that I outline in the main text are more severe.

⁵³⁰ See Dembski 2005, 32-34.

Philosophical Critiques of Dembski

Some critics have argued that Dembski errs in arguing that patterns can be recognized even if the “rejection region” is not specified temporally before seeing the event being discussed (e.g. biological complexity or some other putative example of specified complexity).⁵³¹ However, I do not think this is a weak point of Dembski’s analysis. The natural sciences seem to abound in examples of how a real pattern can be found in some data after its initial discovery. For example, biological order has become better and better understood over time. Dawkins even uses arguments similar to Dembski when concluding that random chance is not a good explanation for biology, because biological order is complex and “specified”, fitting a certain function.⁵³² Dembski provides the example of cryptanalysis, where an apparently random signal is later deciphered by counter-intelligence officers and revealed to contain an encrypted message. In these examples, a real pattern is found temporally after the event.⁵³³

A much more serious problem in Dembski’s design argument is his initial definition of design simply as the exclusion of chance and necessity. As noted, Dembski’s methodology is reminiscent of the Holmesian method: “*when you have eliminated the impossible, whatever remains, no matter how improbable, must be the truth.*”⁵³⁴ However, to even qualify as “improbable”, design must have some positive arguments in its favour, not just arguments against alternatives. It is not enough to say that a chance-based explanation is impossibly improbable if design is equally improbable; rather, design must be a better explanation than chance.⁵³⁵ Dembski’s formulation of his argument as an eliminative inference has been criticized on this basis as a “designer of the gaps”-argument.⁵³⁶ Dembski himself recognized this problem already in his book *The Design Inference* (1998).⁵³⁷ In this work, Dembski wrote that “*the design that emerges from the design inference must not be conflated with intelligent agency. Though they are frequently linked, they are separate.*”⁵³⁸ As Ratzsch argues, Dembski seems to be

⁵³¹ E.g. Elsberry 2007, 253.

⁵³² Dawkins writes: “*Hitting upon the lucky number that opens the bank’s safe is the equivalent – of hurling scrap metal around at random and happening to assemble a Boeing 747. Of all the millions of unique and, with hindsight, equally improbable, positions of the combination lock, only one opens the lock. Similarly, of all the millions of unique and, with hindsight, equally improbable, arrangement of a heap of junk, only one (or very few) will fly. The uniqueness of the arrangement that flies, or that opens the safe, is nothing to do with hindsight. It is specified in advance.*” (Dawkins, 1991, 8).

⁵³³ Dembski 1998a.

⁵³⁴ Doyle 1892, “The Adventure of the Beryl Coronet”, spoken by the character Sherlock Holmes. Dembski himself recognizes the similarity here (2005, 28).

⁵³⁵ Himma 2005, 1; Dawes 2007, 74-75.

⁵³⁶ E.g. Elsberry 2007, 259-260. For further criticisms of Dembski see also Pennock 2001.

⁵³⁷ *The Design Inference* is still Dembski’s most extensive analysis of the design argument and the concept of specified complexity, though he has later modified his argument in many respects. (Dembski 2005, 32-34.)

⁵³⁸ Dembski 1998a, 5.

presupposing that there is some further step, in addition to his explanatory filter, which is required for having evidence of intelligent agency.⁵³⁹

In *The Design Inference* Dembski does indeed also argue that “*there is an intimate connection between design [as identified by the explanatory filter] and intelligent agency.*”⁵⁴⁰ Later Dembski has often written of specified complexity as positive evidence of the action of intelligent agency. Specified complexity, for him, eliminates chance and necessity as explanations, and also acts as evidence for intelligent design as the true explanation of some event: “*Often, when an intelligent agent acts, it leaves behind an identifying mark that clearly signals its intelligence. This mark of intelligence is known as specified complexity.*”⁵⁴¹ As I argued in chapter 4.3, Dembski and the other ID theorists see a connection between teleological features of nature and intelligent design as a cause.

Unfortunately, Dembski does not focus much time on defining the logic of the further step required to move from his eliminative argument to the conclusion that intelligent design is responsible. In many of his accounts of specified complexity, Dembski seems simply to argue that his methodology makes explicit our common, intuitive logic of design detection.⁵⁴² He emphasizes that specified complexity is linked in our inductive experience to intelligent design as a cause, as seen in chapter 4.3. However, the connection between teleological causes and teleological order is much more intuitively clear than the connection between Dembski’s specified complexity and intelligence. Dembski’s explanation for the connection is that intelligence is fundamentally about making choices, and choices (such as between 0 and 1 in binary code) are what define information. So, intelligent beings naturally produce information.⁵⁴³ But this definition of information and choice is much too broad – as will become clear in chapter 6.1, the informational content of any types of order can be described and counted in bits using information theory, even though in many cases it is clear that it is not produced by intelligence. It is not clear how patterns are recognized as “specified” and what is the relationship of “specified complexity” to the more intuitive categories “teleology” and “rational order.” It could be argued that teleology and rational order are both examples of “specified complexity”, since in both cases the observed order fits a complex pattern. However, this still does not make the link between the general category “specified complexity” and intelligent design clear. Dembski uses the term “specified complexity” to provide a more rigorous and non-subjective definition of design, but the problem is that design as an explanation is not as clearly linked to specified complexity as it is to the more subjective concept of teleology. It is therefore not clear how specified complexity can help us avoid the traditional evidences of design such as the rationality, teleology and beauty of nature.⁵⁴⁴

⁵³⁹ Ratzsch 2001, 155.

⁵⁴⁰ Dembski 1998a, 62.

⁵⁴¹ Dembski & Wells 2008, 165.

⁵⁴² E.g. Dembski & Wells 2008, chapter 7; Dembski & Witt 2010.

⁵⁴³ Dembski 1998a, 62.

⁵⁴⁴ Similarly Murray 2003, 7-8.

In the same vein, many critics of Dembski have also argued that our actual methods for detecting design are quite different. For example, Mark Perakh and Matt Young argue that our design inferences work in the cases outlined by Dembski only *“because of our extensive knowledge about such objects and the human designers who create them.”*⁵⁴⁵ Perhaps our design inferences are actually based on the comparison of different likely explanations based on our background knowledge, so that the role of background assumptions is much greater than Dembski’s methodology can acknowledge.⁵⁴⁶ As noted, Ratzsch similarly argues that we recognize design first by signs of artefactuality and only secondly by markers of intelligent agency such as complexity and rationality. Though Ratzsch defends the possibility of design arguments, he also rejects Dembski’s specified complexity as a description of this rationality.⁵⁴⁷

The power of Dembski’s argument to eliminate explanations based merely on chance is often acknowledged in the discussion. However, typically critics of Dembski have argued that nature itself might nevertheless possess self-organising powers that do not rely merely on random chance or natural regularities, but on a dynamic evolutionary process combining both. It has been argued that evolutionary theory provides a counter-example to Dembski, because it shows that specified complexity can be generated by the regularities and probabilistic processes of nature. Evolutionary theory does not postulate any random events exceeding Dembski’s universal probability bound. Rather, biological order is thought to emerge through small successive steps. Though the emergence of all biological complexity at once would be a random event too incredible to be believed, its emergence through small successive steps is thought to be well within the normal operation of nature.⁵⁴⁸

Dembski has initially tried to provide a mathematical formula for showing that there is “law of conservation of information” which makes the generation of new specified complexity impossible even through combinations of lawful regularity and random chance. However, when responding to the above crucial evolutionary critique of his argument, Dembski depends completely on other arguments against the plausibility of the Darwinian mechanism. The main argument referenced by Dembski is Michael Behe’s argument from irreducible complexity. Dembski argues that the problem of irreducible complexity shows that biological specified complexity cannot be broken up to sufficiently small steps; even the emergence of one new irreducibly complex biochemical machine is so improbable through Darwinian mechanisms that it would violate the universal probability bound.⁵⁴⁹ Recently, Dembski has expanded his argument to accommodate Darwinian evolution. According to Dembski, if evolution does work, then his information-theoretical arguments show then it must have been designed to do so. If this argument succeeds, then even the production of

⁵⁴⁵ Perakh & Young 2006, 194-195.

⁵⁴⁶ Sober, Fitelson & Stephens 1999.

⁵⁴⁷ Ratzsch 2001, appendix. Similarly Muller 2004 argues that Dembski’s explanatory filter does not adequately describe how we detect design, though Dembski is on the right track.

⁵⁴⁸ Sober, Fitelson & Stephens 1999.

⁵⁴⁹ Dembski 2002a, chapters four and five.

specified complexity through evolution would not necessarily provide a counter-example to Dembski.⁵⁵⁰ I will continue this discussion in chapters six and eight.

Inference to the Best Explanation or to the Only Explanation?

The critique of alternative explanations is also important for inferences to the best explanation, so in a sense it does not matter whether the design argument is called an inference to the best explanation or an inference to the only explanation. The differences between the two arguments are mainly of emphasis and degree of certainty. It seems that in principle it would already be interesting to argue that design is simply the most plausible explanation for some pattern in nature, rather than being the only remotely plausible explanation. This would mean that the effects of background knowledge on the argument would have to be considered in more detail, and the positive case for design would have to be emphasized more. Perhaps Dembski's argument could be better formulated as an inference to the best explanation, comparing the combination of chance and law-like regularities and design as explanations. He could then argue against the plausibility that chance and law-like regularities could have produced some of the order in nature using the same arguments.

Puzzlingly, Dembski himself rejects this interpretation of the design inference in favour of his own eliminative design inferences.⁵⁵¹ Dembski's argument is that inferences to the best explanation are based on Bayesian reasoning while his design inference is based on Fisherian reasoning for rejecting a chance-based explanation. However, only Dembski's rejection of chance-based explanations is based on Fisherian reasoning. His acceptance of design has an inductive basis that would be well described by Bayesian reasoning.

Dembski has argued his case for specified complexity in at times highly technical and mathematical form, beginning with his book *"The Design Inference"* (1998). Both Behe and Meyer have seen specified complexity as a good description of design. Behe's definition of design as the *"purposeful arrangement of parts"* and his idea that the strength of the design inference increases as the complexity and specificity of order increases come rather close to Dembski. Behe also explicitly refers to Dembski as providing a possibly more rigorous definition of design.⁵⁵² Meyer, too, uses specified complexity in his work to argue against chance and natural law as explanations for the origin of life. For Meyer, Dembski's *"specified complex information"* well describes the sort of information found in DNA.⁵⁵³ However, neither Behe nor Meyer use Dembski's mathematical formulations, or Dembski's explanatory filter as a premise of their arguments. Rather, they rely more on the common understanding

⁵⁵⁰ Dembski & Marks 2009

⁵⁵¹ E.g. Dembski 2005, 35-37; Dembski 2003, chapter 32.

⁵⁵² Behe 2006a, chapter 9, note 5.

⁵⁵³ Meyer 2009.

of inferences to the best explanation, with Dembski's arguments serving in an auxiliary role to help eliminate chance and regular natural processes as explanations.

In chapter four, I have argued that the ID movement's design argument is best understood as an inference to best explanation, with inductive and conceptual arguments supporting the credibility of design as an explanation.⁵⁵⁴ However, several different formulations of the argument are logically valid. As Gregory Dawes has argued, *"While a great deal of abuse has been directed at intelligent design theory (ID), its starting point is a fact about biological organisms that cries out for explanation, namely "specified complexity" (SC). Advocates of ID deploy three kind of argument from specified complexity to the existence of a designer: an eliminative argument, an inductive argument, and an inference to the best explanation. Only the first of these merits the abuse directed at it; the other two arguments are worthy of respect. If they fail, it is only because we have a better explanation of SC, namely Darwin's theory of evolution by natural selection"*.⁵⁵⁵ My analysis supports Dawes' contention that Intelligent Design's analogical, inductive arguments and the inference to the best explanation could all in principle be convincing. Whether they actually are convincing depends on the state of the evidence. I also agree with Dawes that eliminative arguments without positive reasons to believe in design are not worth much. Eliminative arguments must be used as part of an inference to the best explanation or an inference to the only explanation to be of use.

The Intelligent Design movement and many commentators agree with Dawes that the critique based on naturalistic explanations for "design-like" properties is the central critique of design arguments. This is the central reason why proponents of Intelligent Design spend so much time arguing against naturalistic explanations. In my analysis of the logic of the design argument in this chapter, I have also presented reasons for seeing this comparison with natural explanations as crucial. However, in later chapters I will be arguing that design arguments and natural explanations are not necessarily opposed, but could also be conceived as explanations that work on different levels. The acceptance of the Darwinian process need to imply that biological design does not give any evidence of design at all. But arguing for this conclusion cannot proceed until I have examined the details of Intelligent Design's cosmic and biological design arguments.

⁵⁵⁴ Dawes (2009, 107-108) similarly argues that Stephen Meyer's design argument is an inference to the best explanation supported by inductive arguments.

⁵⁵⁵ Dawes 2007, 69.

5. COSMIC DESIGN

This chapter focuses on ID's cosmic design arguments, which are based on global properties of nature such as the fine-tuning of the natural laws necessary for the existence of complex life, and the rationality of the cosmos which makes scientific discovery possible. Cosmic design arguments have been created outside the Intelligent Design movement, and the ID theorists use these theorists in formulating their own cosmic design arguments. The most influential proponents of the fine-tuning argument are outside the ID movement. However, Robin Collins, who presents the most in-depth contemporary defence of the fine-tuning design argument, has previously been a fellow of the Discovery Institute. Though Collins has since parted ways with the ID movement, this history makes it probable that there has been some cross-pollination between contemporary cosmic and biological design arguments.⁵⁵⁶ Because much of the important discussion has happened outside the discussion on Intelligent Design, I will also reference many arguments made outside the ID literature in this chapter. I then analyse how these arguments relate to the discussion within Intelligent Design.

However, as I argued in chapter 3.3, cosmic design arguments are also important for the ID movement. In the movement's discourse, cosmic design arguments function to legitimize the question of biological design: if there is design on the cosmic level, why not also on the level of biological details? However, there are also differences between cosmic and biological design arguments. Though cosmic design arguments utilize empirical data, they nevertheless operate on a different explanatory level than natural science, and their proponents can accept all mainstream scientific theories as they are. Biological design arguments, however, are often construed as a comparison of the explanatory powers of naturalistic evolution and intelligent design in explaining biological complexity.

5.1. The Suitability of the Cosmos for Life

The basic idea that nature must have properties which allows for the existence of complex life seems to be as true as the fact of our existence.⁵⁵⁷ At the everyday level, this can be seen in the way human life depends on the environment. Life operates in a complex ecosystem which is itself dependent on antecedent conditions: soil must have nutrients that allow the

⁵⁵⁶ For Collins' defence of the fine-tuning argument, see e.g. Collins 2012; for his quite friendly critique of Intelligent Design, see Collins 2006.

⁵⁵⁷ According to Ikeda & Jefferys (2006), though, this is only obvious on the naturalistic understanding of reality. Supposing that God wanted to create and sustain human life, he could in principle also do so through constant miracles without creating a cosmos that allows for the evolution or sustenance of complex life. However, this is not the traditional Christian understanding of how God creates. For philosophical criticisms of Ikeda & Jefferys, see Monton 2008.

growth of plants, water must be present, as must air and light. Water, wind and fire have been used to power our economies and technology and the phenomena of astronomy have allowed the creation of calendars. It may be quite natural to wonder whether these and other environmental factors were not in fact designed for our benefit, and are not just accidentally useful.⁵⁵⁸ A design argument to this effect was already formulated by the Jewish philosopher Philo (20 BC - 40 AD), who argued that the cosmos can be compared to a house which has been built to accommodate people. According to Philo, just as we would immediately see that a well-built house has an architect, so we should also see the cosmos as designed. In both cases, Philo sees the apparent teleology as a sign of purposive design.⁵⁵⁹

The Fine-Tuning Argument

The fine-tuning design argument is based on the observation that the laws of nature allow for the existence of complex life. The “weak anthropic principle”, popularised by John Barrow and Frank Tipler, states that *“the observed values of all physical and cosmological quantities are not equally probable but they take on values restricted by the requirement that there exist sites where carbon-based life can evolve and by the requirement that the Universe be old enough for it to have already done so.”*⁵⁶⁰

The modern fine-tuning design argument is based on the way the natural sciences have explicated the requirements for the evolution of carbon-based complex life. It appears that the requirements for the emergence of complex life are very stringent, and if the constants of nature were slightly different, the evolution and continued existence of complex life would be impossible. In the discussion concerning fine-tuning, the use of the term “fine-tuning” is not typically understood to assume that there is a designer. The idea is rather that the laws of nature are balanced between extremes and are just right to allow for the existence of life. Supposing that the laws of nature were slightly different in this or that direction, then life would not be possible. ID theorists Gonzales and Richards illustrate this with the analogy of a universe-creating machine. The machine contains a dial for each law and constant of nature. All of the different variables have to be set just right for life to be possible. The conditions required for life are stringent, and it seems that *“if we were just to pick these values at random, we would almost never find a combination compatible with life or anything like it.”*⁵⁶¹

There are many examples of fine-tuning in the scientific literature, and very few critics of the fine-tuning argument question the fine-tuning of the cosmos for life.⁵⁶² Cosmologists

⁵⁵⁸ Barrow & Tipler 1996, chapter 2. The idea about providence can be found in Scriptures like Psalm 104. Interestingly, this psalm emphasizes God’s providential care not just for humans, but also for animals.

⁵⁵⁹ *Legum Allegoriae* III, 32, 98-99. Hurlbutt 1985, 8.

⁵⁶⁰ Barrow & Tipler 1996, 16. ID theorists Gonzales and Richards simplify the principle as follows: *“we should expect to observe conditions, however unusual, compatible with or even necessary for our existence as observers.”* (Gonzales & Richards 2004, 136.)

⁵⁶¹ Gonzales & Richards 2004, 197.

⁵⁶² Stenger (2011) is a prominent exception to this trend.

and physicists with very different worldviews— such as Martin Rees⁵⁶³, Paul Davies⁵⁶⁴, and Stephen Hawking⁵⁶⁵ – acknowledge the reality of fine-tuning. In light of this quite broad consensus, Collins seems to be right to argue that while some examples have been shown to be poor in the course of time, most have stood the test of time. It thus seems unlikely that the majority of the examples will be shown to be scientifically incorrect.⁵⁶⁶ There is vast literature on fine-tuning, where these and other examples are explored and many are shown to have good evidence.⁵⁶⁷

The evidence for fine-tuning can be broadly classified into four types. First (1), the general existence and properties of the laws and forces of nature is important. For example, all of the four basic forces have to exist.⁵⁶⁸ Second (2), The relative strengths of the basic forces of nature must be such that they allow life to exist.⁵⁶⁹ Third (3), the starting conditions of the cosmos must be appropriate, with the proper arrangement of matter and anti-matter.⁵⁷⁰ Fourth (4) the properties of the elements which are consequences of the previous three factors must allow for life: life needs suitable “building blocks.”⁵⁷¹

In the general literature about fine-tuning, a common example of this fitness of the laws of nature for life comes from the fine-tuning of the four basic forces of nature. These examples fall into the first and second category, and are commonly used by the ID theorists.⁵⁷² The strengths of gravity, electromagnetism, the strong nuclear force and the weak nuclear force must be in right proportion to each other. The strong nuclear force holds the protons and neutrons of the atomic nuclei together, offsetting the natural repulsion between positively charged protons. With a weaker strong nuclear force, we would have much fewer elements, missing many of those crucial to life. The lighter elements would also be radioactive to the extent of making life impossible. If the gravitational force were weaker, the expansion after the Big Bang would have been too rapid and clumps of matter like stars and galaxies could not have formed. If it were stronger, the universe would have collapsed in on itself. It is that in addition to existing, all of the major constants have to have values which are suitable for life.⁵⁷³

Examples of the fourth type of fine-tuning have also been commonly used by the ID movement, and here the movement has even advanced the discussion itself. These examples are closer to the level that is observable in our everyday lives or with basic scientific instruments. It is argued that the properties of water, oxygen, light and carbon are fine-tuned

⁵⁶³ Rees 2000.

⁵⁶⁴ Davies 1982, chapter 4; Davies 2006.

⁵⁶⁵ Hawking & Mlodinow 2010.

⁵⁶⁶ Collins 2003.

⁵⁶⁷ See e.g. Barrow, Conway-Morris, Freeland & Harper (eds) 2008.

⁵⁶⁸ Collins 2012.

⁵⁶⁹ Rees 2000.

⁵⁷⁰ Davies 1982, chapter 4; Davies 2006.

⁵⁷¹ Denton 1998; Barrow, Conway-Morris, Freeland & Harper (eds) 2008.

⁵⁷² Gonzales & Richards 2004, 201-205. Denton 1998, Behe 2007, Dembski 2003, Meyer 1999.

⁵⁷³ Leslie 1989, 2-6; Collins 2003, 183-190.

for life.⁵⁷⁴ The properties of water are a popular example. Water is an essential liquid to life for many reasons: it appears to the ID theorists that all of its properties are fine-tuned to benefit life. Water has anomalous thermal properties when compared to other substances. Typically, things contract when they cool and expand when they are heated. Water, by contrast, contracts up to 4 °C, and then starts to expand, turning into ice at 0 °C. This is important because the densest water will also sink to the bottom. If frozen water was more contracted and thus heavier than water at 4 °C, lakes and oceans would freeze from the bottom up. This ice, untouched by the melting rays of the sun, would accumulate year by year and eventually our planet would be locked in a perpetual ice age. The ID theorists are able to present numerous examples like this from the other properties of water, as well as the properties of carbon, oxygen and light. Again, the argument is that these properties are remarkably fine-tuned for allowing the existence of life, and that this is best explained by intelligent design.⁵⁷⁵

The Rationality of the Cosmos

The data used in cosmic design arguments is not limited to the fine-tuning of the cosmos, however. The cosmic design argument also appeals to the general rationality of the cosmos. Albert Einstein famously said that *"the most incomprehensible thing about the universe is that it is comprehensible."*⁵⁷⁶ In the broader discussion on fine-tuning, this argument has been developed by philosophers like John Leslie, Richard Swinburne and Robin Collins.⁵⁷⁷ The argument has also been taken up and extended by the ID movement's theorists Benjamin Wiker, Jonathan Witt, Guillermo Gonzales and Jay Richards.⁵⁷⁸

The design argument based on the rationality of the cosmos is not based just on the general intelligibility of the cosmos. Rather, particular features of the order of nature are argued to be fine-tuned so as to make nature comprehensible and amenable to scientific discovery. Thus the possibility of natural science and the development of technology are upheld alongside the possibility of complex life as another outcome of fine-tuning. The ID theorists consider these features of the universe to be surprising and in need of explanation.⁵⁷⁹

⁵⁷⁴ Gonzales & Richards (2004) and Wiker and Witt (2006) follow Denton 1998 in developing this argument. Behe repeats parts of the argument, but doesn't develop it much further (2007, 207-216). There is one difference in how the ID theorists construe the fine-tuning argument when compared to many theistic evolutionists: for the ID theorists, the fine-tuning of the natural laws is not sufficient to make the evolution of all of life possible, but further actions from the designer are required.

⁵⁷⁵ Wiker & Witt 2006, Gonzales & Richards 2004.

⁵⁷⁶ Quoted in Wiker & Witt 2006, 237.

⁵⁷⁷ Leslie 1989, 58-61; Swinburne 2004a, chapter 8, Collins 2005a.

⁵⁷⁸ E.g. Wiker & Witt 2006, Gonzales & Richards 2004.

⁵⁷⁹ It is interesting that these two possibilities are used as the most central examples of fine-tuning. Richard Swinburne's (2004) fine-tuning argument is on a more general level: he argues that the laws of nature are structured in this way not just to allow for natural science, but to allow for fruitful interaction between people

As one example of such an empirical argument, Guillermo Gonzales and Jay Richards have argued that empirical studies have revealed a correlation between the conditions that allow for habitability and the conditions that allow for scientific discovery. They argue that only a very small section of the universe is habitable, and it is this same section which also allows for scientific discovery. The features which are fine-tuned for life are, according to this analysis, simultaneously fine-tuned for discovery.⁵⁸⁰

The properties of the Earth's atmosphere form one example of the correlation discussed by Gonzales and Richards. The atmosphere contains elements like oxygen, which are highly beneficial for life and technology. Oxygen is reactive and can thus provide energy for larger living organisms as well as the fires of technology. It protects us from solar radiation in the form of ozone. Simultaneously, our atmosphere also allows for the visible spectrum of light to pass through it. Here our atmosphere is different from many other planets which have a dense cloud covering at all times. Many gases do not allow for the passage of light. Thus the Earth's atmosphere is simultaneously beneficial to life and allows for scientific discovery, unlike the atmospheres of other known planets. Gonzales and Richards provide many other examples of this correlation, and conclude that this pattern is best explained by intelligent design.⁵⁸¹

A similar argument comes from the effectiveness of mathematics in scientific theories about the universe. According to Benjamin Wiker and Jonathan Witt, for scientists "*the greatest and most peculiar intellectual exhilaration occurs when they find that the order of mathematics illuminates the order of reality.*"⁵⁸² Mathematics is a human language, which is nevertheless highly applicable to the study of nature. The possibility to formulate the basic laws of physics in simple mathematical language has been highly conducive for the development of natural science. Highly theoretical developments in mathematical theory which have been studied simply for the sake of developing the system in a logically consistent way have turned out to be highly useful in studies of nature.⁵⁸³ This pattern is not an invention of the ID theorists. Eugene Wigner's classic 1960 paper "*The Unreasonable Effectiveness of Mathematics in the Natural Sciences*" is an interesting and widely discussed discussion on this, which the ID theorists follow. According to Wigner, "*The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve.*"⁵⁸⁴

and the world in general. The ID movement's emphasis reveals the emphasis it gives to the importance science and technology and its desire to show the importance of design for natural science.

This design argument is different from the more general "argument from intelligibility" championed by Hume (1777). While Hume argues that it may be incoherent to claim that some part of the universe could be unintelligible, the design argument makes no such claim. It is rather based on the idea that empirical studies have revealed many apparently contingent features of the universe which make it intelligible.

⁵⁸⁰ Gonzales & Richards 2004.

⁵⁸¹ Gonzales & Richards 2004. Similarly Behe 2007, 208-209; Denton 1998, 21-46; Wiker & Witt 2006.

⁵⁸² Wiker & Witt 2006, 103.

⁵⁸³ Wiker & Witt 2006.

⁵⁸⁴ Wigner 1960, discussed also in Dembski 1999b. A critic could argue that there are also theories of mathematics which are useless for natural science, but this would be missing the point. It is still remarkable that mathematics

Wiker and Witt admit that the progress of science has been a long and arduous journey of discovery. No matter how far we probe, we encounter ever further mysteries. Our best scientific theories turn out to be just approximations from which we can proceed to more accurate theories. For Wiker and Witt, this nevertheless does not provide counterevidence to the claim that the universe is intelligible. This is because on each level of increasing understanding, our models of reality still work and allow us to proceed deeper into understanding nature.⁵⁸⁵ In response, one could argue that many current theories of physics, such as quantum mechanics, are counter-intuitive and are only understood by a handful of brilliant physicists. There may be some truth to this critique, but on the other hand quantum theory can also be understood as a further example of our coming to understand the cosmos.⁵⁸⁶ Einstein thought the universe was intelligible, even though his work on general relativity is certainly not understood by all.

Wiker and Witt thus interpret the simultaneous mysteriousness and intelligibility of nature as a strength of the design argument. Using the periodic table as one example, they argue that the order of nature is built in a way that makes it possible for us to proceed to an ever deeper understanding of nature: *“The universe, and our privileged place in it, proves not only meaningful; the cup of its meaning continually overflows into mystery and wonder. The universe is crafted to condescend to our capacities as a teacher to a student and to draw us patiently upward; and the superabundance of intelligibility is a sign that it was made by a mind that far exceeds the merely human.”*⁵⁸⁷ For Wiker and Witt, the *“marks of genius”* in a work of design include clarity, depth, elegance and harmony. The argument is that if genius is recognized in the human context by these marks, then genius can also be discerned in the cosmic order by these same marks.⁵⁸⁸ Wiker and Witt thus argue that if the universe was intelligible without being mysterious and open to ever deeper understanding, we would be left with a lesser appreciation of its Creator. Their argument tries to go beyond the conclusion that there is an intelligent designer to the conclusion that this designer possesses the attribute of ingenuity. Here the design argument almost approaches the tone of worship: Wiker and Witt revel in the magnity of the the wisdom and power of the *“intelligent designer”*.

In the latter stages of their analysis, Wiker and Witt bring the concept of beauty into their analysis of fine-tuning as something that complements our appreciation of how special the order of nature is. They argue that the true meaningfulness of fine-tuning can only be seen when we consider the marvelous beauty and plurality of complex life which fine-tuning makes possible. *“The chemical elements themselves (made possible by fundamental, cosmological fine-tuning) point toward living things, carrying in their very structures extraordinary and exact*

is so useful for natural science, and that many highly esoteric and at first useless theories of mathematics have later turned out to be essential for the progress of natural science. Coincidence is a poor explanation for this. See Steiner 1999 for a critique of naturalism based on the applicability of mathematics.

⁵⁸⁵ Wiker & Witt 2006.

⁵⁸⁶ See e.g. Barrow 2002.

⁵⁸⁷ Wiker & Witt 2006, 245.

⁵⁸⁸ Wiker & Witt 2006, chapter 3

chemical potentialities beautifully designed for actualization in the biological world."⁵⁸⁹ This fine-tuning helps us appreciate the surface beauty of the world: *"a rose is most meaningful to us when we understand it as a kind of dramatic culmination, one possible only because all these layers of complexity are integrated by and toward the whole, brought into harmony in and by the living form itself."*⁵⁹⁰ Similarly, Gonzales and Richards note that the need for an explanation for fine-tuning becomes more clear if we share the assumption that a *"fine-tuned habitable universe has an intrinsic value that an uninhabitable one would lack."*⁵⁹¹ Thus even ID's cosmic design arguments are clearly influenced by considerations of value and beauty, though these are typically not included when the argument is stated formally.

5.2. Understanding the Cosmic Design Argument

The Argument in Theistic Natural Theology

Within theistic natural theology, cosmic design arguments have typically been formulated as inferences to the best explanation. The data to be explained is the fine-tuning of the cosmos for life (given the stringent requirements for building life) and the rationality of the cosmos. The hypothesis that this order is created by a theistic God is thought to be a far likelier explanation than any naturalistic explanation, particularly random chance.⁵⁹²

But what are such claims of likelihood based on? In inferences to the best explanation, the hypothesis must somehow help make the data more likely than without the hypothesis. For example, if this type of order is something that we would expect a designer to produce, then this gives the hypothesis some likelihood. On the hypothesis that there is a designer who wanted to create life, and intended to arrange the laws and properties of nature to allow for this, the data is thought to make more sense than on the hypothesis that there is no such designer.

The hypothesis that the designer is the good God of theism plays an explanatory role in the cosmic design arguments of theistic natural theology. Swinburne, for example, argues a good God would likely create laws of nature in a way that make it possible for his creatures to exist and interact with their environment. This leads to the conclusion that God would create a rational cosmos amenable to discovery and fine-tuned for life. Furthermore, Swinburne argues that there is no atheistic explanation which makes these features of the universe probable. Thus the observed properties of nature form, for Swinburne, evidence in favour of theism.⁵⁹³ Collins similarly argues that if we can assume that the existence of life is

⁵⁸⁹ Wiker & Witt 2006, 223.

⁵⁹⁰ Wiker & Witt 2006, 242.

⁵⁹¹ Gonzales & Richards 2004, 300. Similarly Ratzsch 2001.

⁵⁹² Collins 2005a, 179. For Collins' extended defence of the fine-tuning argument, see Collins 2012.

⁵⁹³ Swinburne 2004a, chapter 8.

a good thing, then it is not frivolous to assume that a good God would want to create life.⁵⁹⁴ Here a connection can be made to the classical doctrine of creation, where God's motive for creation is based on his goodness: God wants to create good things and give love.⁵⁹⁵

However, it should also be noted that medieval theologians generally believed that God did not need to create in order to satisfy his goodness: the inner love of the Trinity already satisfies the need to give love. Speaking of the probability that God would do something seems strange, but the general idea of identifying some reason (e.g. love) in what God does is central to the traditional Christian theology of creation.⁵⁹⁶ As I argued in chapter 3.3, personal explanation is different from mechanistic explanation invoking law-like regularities. Agents have reasons for their actions, but they are often quite difficult to predict beforehand.

Within theistic natural theology, cosmic design arguments are used as part of a cumulative case of theistic arguments, and are not thought to work alone. Theistic theologies of nature can also make use of the argument, and argue that the fine-tuning of the cosmos is evidence that is consonant with the doctrine of creation, but does not suffice to prove it. Once we already believe in the value of life and the rationality of God, however, we can find that this belief receives support from the cosmic design argument.⁵⁹⁷

The Argument in the Intelligent Design Literature

Intelligent Design theorists have referred to the formulations used by Collins and Swinburne approvingly.⁵⁹⁸ However, because these formulations are openly theistic, they are in tension with the ID movement's strategy of not identifying the intelligent designer as the good God of theism. To be consistent, the ID movement needs to provide a cosmic design argument for an unidentified designer. This inference would also be an inference to the best explanation, though here the hypothesis lacks the support of broader theistic philosophical arguments which Swinburne and Collins believe are essential to the argument. This tension is not sufficiently explored in ID literature.

However, Robin Collins himself does provide an alternative way of stating the argument that is more congenial to ID's minimalistic design hypothesis. Collins writes: "*In the case of the fine-tuning, we already know that minds often produce fine-tuned devices, such as Swiss watches. Postulating God – a 'supermind' – as the explanation of the fine-tuning, therefore, is a natural extrapolation from what we already observe minds to do.*"⁵⁹⁹ In this inference, the motives of the Creator do not do the explanatory work. Rather, this inference relies on the

⁵⁹⁴ Collins 2012.

⁵⁹⁵ Hart 2003.

⁵⁹⁶ See Kretzmann 1991 & 1999 for discussion.

⁵⁹⁷ Thus McGrath 2009a.

⁵⁹⁸ E.g. Dembski 2003 and Meyer 1998.

⁵⁹⁹ Collins 2005b, 661.

design connection as described in chapter 4.3. The features of the universe discussed in cosmic design arguments are treated as independent “parts” of the cosmos that all appear teleologically directed to the purpose of allowing rational life in the cosmos. If producing teleology is something that minds do well, and the cosmos appears to exhibit teleology, then positing a “supermind” to explain this appearance would at least be some kind of an explanation of the data. Again, the causal powers attributed to the designer do the explanatory work, and it is not required that we need to be able to predict the existence of the cosmos based on the hypothesis.

William Lane Craig has also used William Dembski’s work in formulating the cosmic design argument. As I showed in chapter 4.5, Dembski’s design argument works by eliminating chance and necessity as possible explanations for some pattern or event and then concluding that design is its only plausible explanation. Craig formulates the argument as follows:

- (1) The fine-tuning of the initial state of the Universe is due to either physical necessity, chance or design.
- (2) It is not due to physical necessity or chance
- (3) Therefore, it is due to design.⁶⁰⁰

Craig and many others argue that the probability of the constants and quantities of nature having the precise values which are needed for life by random chance is extremely low, well exceeding Dembski’s universal probability boundary.⁶⁰¹ The pattern formed by several natural laws and constants, which have to fall into a limited range, is according to Craig both complex and specified. This allows for the use of the Fisherian method to reject chance as an explanation. Again, identifying a specification relies on the ability of the human mind to identify a real pattern needing explanation in the data. Probabilistic arguments like this have also been used in theistic cosmic design arguments to help eliminate naturalistic explanations.⁶⁰²

One problem with this argument stems from evaluating the probability of the fine-tuning. On the understanding that evaluations of probability are based on our knowledge of the causal processes which operate in a given situation, this is impossible, since evaluating the likelihood of the values would require background knowledge of the natural processes which could have generated these values. However, since we do not know any natural processes which are at a deeper level than the data used in the cosmic design argument, we cannot give a statistical probability to the values. This has been called the “normalization problem”.⁶⁰³ However, Collins has argued that it is possible to construct a different understanding of probability which makes it possible to give some estimate of the likelihood

⁶⁰⁰ Craig 2003.

⁶⁰¹ Craig 2003, Gonzales & Richards 2004, Denton 1998, Behe 2007.

⁶⁰² Collins 2012.

⁶⁰³ See e.g. McGrew, McGrew & Vestrup 2003; and Manson 2009.

of natural constants for the purposes of the argument. Collins emphasizes that this argument only requires the evaluation of *epistemic* likelihoods (understood as what we have grounds to expect based on some hypothesis) instead of *physical* likelihoods (what is in actual physical reality likely or necessary). The procedure for calculating the likelihoods of the constants of nature is similar to the process for creating a null hypothesis in statistics, and assuming that the range can vary is also the standard beginning hypothesis used in other cases. So, in this case we could indeed calculate some probabilities for the constants of nature, and use these to compare the design-based explanation to chance.⁶⁰⁴

5.3. Cosmic Design and Naturalism

The formulations of the cosmic design argument again reveal the importance of contrasting design with naturalistic explanations. It is argued that the rational order of the cosmos has something that is explained better by a design hypothesis than by any naturalistic alternative – and perhaps even that some things about the cosmos cannot be explained at all on the naturalistic picture. I will now analyse four different naturalistic rejoinders to the argument and the discussion surrounding them. First (1), there are naturalistic alternative explanations for the order of the cosmos. In effect, these explanations are allies of the design argument, because they at least admit that there is something to be explained about the laws of nature. Second (2), the problem of natural evil is used as counter-evidence to the fine-tuning. Perhaps the cosmos is not so fine-tuned after all, it is argued. Third (3), it is argued that it is possible to just accept the existence of the cosmos as a brute fact, and deny the rationality of seeking any further explanations. Fourth (4), the explanatory power of the design argument is criticized. It is argued that it is better to state that one does not know the explanation than to posit that design is the explanation for fine-tuning.

Naturalistic Explanations for Fine-Tuning

Collins divides naturalistic explanations for fine-tuning into atheistic one universe -models and atheistic many universes -models.⁶⁰⁵ In one universe -models, it is hypothesized that the fine-tuning can be explained by referring to some physical explanation beyond the known laws of nature. For example, perhaps string theory can help explain the values of the

⁶⁰⁴ See further in Collins 2005a, 179, and the extended discussion in Collins 2012, 226-252. The possibility of fine-tuning arguments against the normalization problem is also defended with a different strategy by Koperski (2005).

⁶⁰⁵ Collins 2005a, 184-185. These critiques thus typically admit the existence of fine-tuning beneficial to life. For further discussion of the distinction between different uses of the word “probability” in fine-tuning arguments, see Monton 2006, 407-413.

constants of nature. It is thus hoped that ultimately nature's order can be explained without intelligence.⁶⁰⁶

Another naturalistic explanation for cosmic design is the multiverse hypothesis.⁶⁰⁷ The idea is that there may be an infinite or at least enormously large amount of universes, with varying constants of nature and natural laws.⁶⁰⁸ This may be supported with the many worlds interpretation of quantum mechanics, which states that our world is continually dividing up into new worlds.⁶⁰⁹ The weak anthropic principle is then used to explain why we find ourselves in a world with laws of nature that can sustain our existence. The answer is simply that we could not live and observe a world which did not allow for our existence.⁶¹⁰ So, if the universe appears designed to us, this is only because of this selection effect, which ensures that we will only ever observe a fine-tuned universe. However, the vast majority of universes may well be hostile to life.⁶¹¹

A common way of arguing for the explanatory superiority of design is based on how well supported each hypothesis is by our background knowledge. Many argue that multiverse hypotheses are simply *ad hoc* to explain the data. For example, Dembski argues that potentially any data could be explained by a multiverse hypothesis, since it gives unlimited probabilistic hypothesis and destroys any notion of a probability bound, thus leaving us with no basis to reject chance hypotheses. For example, it could be argued that the pianist Arthur Rubinstein manages to play the piano beautifully by chance, rather than because of his skill. Though the design hypothesis is commonsensical, one could argue that given an infinite amount of universes, we can expect to observe an infinite amount of bumbling idiots who can play the piano just as well by random chance.⁶¹²

To avoid this critique, the *ad hoc* nature of the multiverse hypothesis needs to be denied. There is indeed some independent rationale for the hypothesis. For example, some interpretations of inflationary theory and quantum mechanics require a multiverse.⁶¹³ In response, a proponent of the design argument could argue that there is no reason to accept these models, other than the rejection of the design argument. Proponents of design arguments who accept theism could also argue, following Collins, that the theistic hypothesis at least is less *ad hoc* than the multiverse hypothesis, since it was formulated and strongly believed already prior to the discovery of fine-tuning.⁶¹⁴ Using this strategy would

⁶⁰⁶ E.g. Greene 2005.

⁶⁰⁷ E.g. Dawkins 2006a.

⁶⁰⁸ Rees 2003.

⁶⁰⁹ Susskind 2006a.

⁶¹⁰ John Leslie's example of a firing squad is often used to show that the anthropic principle does not by itself explain the fine-tuning. (See Leslie 1989, 13-15).

⁶¹¹ Dawkins 2006a.

⁶¹² Dembski 2003b; see also similar arguments in Behe 2007. Behe's critique is directed against the absurdity of an infinite multiverse. However, it is also possible to formulate a multiverse hypothesis where the multiverse is finite, and probabilistic resources are not infinite.

⁶¹³ For more on these, see Rees 2003, Susskind 2006a.

⁶¹⁴ Collins 2012, 205-209. A further way of arguing that theism has a higher background probability is to argue that theism is a simpler explanation than the multiverse. (See Swinburne 2004c, 305-306). In response to this, it has

require the Intelligent Design movement to give up its minimalistic design argument, however, and engage in a more robust theistic natural theology.

In a way, naturalistic explanations for fine-tuning are congenial to design arguments, since they at least admit that there is something to be explained in the order of the universe. Proponents of the multiverse hypothesis agree that it is not satisfactory to just argue that the universe is a brute fact. Leonard Susskind puts the point as follows: *“Our own universe is an extraordinary place that appears to be fantastically well designed for our own existence. This specialness is not something that we can attribute to lucky accidents, which is far too unlikely. The apparent coincidences cry out for an explanation. – – But this [design] is an intellectually unsatisfying, if emotionally comforting, explanation. Left unanswered are: who designed the designer, by what mechanism the designer intervenes to guide evolution, whether the designer violates the Laws of Physics to accomplish its goals, and whether the designer is subject to the laws of quantum mechanics.”*⁶¹⁵ In Susskind’s analysis, the multiverse hypothesis is explanatory better than the design hypothesis, because the design hypothesis leaves unanswered questions. However, the basic admission of the need of an explanation leaves the door open for natural theologians and ID proponents to answer these questions, and to argue that design actually explains the data better.

The goodness of the universe we inhabit, and so the problem of natural evil, is relevant for evaluating the explanatory power of the design argument against naturalistic hypotheses. In the multiverse hypothesis, the explanation for why we find ourselves in a habitable universe is that otherwise we could not be alive at all. However, this hypothesis only explains fine-tuning that is necessary for life. The defenders of the cosmic design argument claim that the fine-tuning actually extends well beyond that needed for survival. For example, the rationality of the cosmos and its amenability to discovery does not seem to be predicted at all by the multiverse hypothesis. Thus design is argued to explain the properties of nature better.⁶¹⁶

Within the Intelligent Design movement, Behe argues similarly that the amount of different biological forms possible and the amount of purposeful biological complexity in the universe are also not predicted by the multiverse hypothesis, but are explained by design.⁶¹⁷ Denton argues that the multiverse hypothesis also does not explain the evolution of our abilities for art, music and philosophy, which are unnecessary for our survival.⁶¹⁸ As I argued in chapter 5.1, here the concept of fine-tuning used in the ID literature is quite broad, encompassing the whole spectrum of “natural good”: the beauty, rational orderliness and the useful arrangements of the natural world as a problem for atheism. This is another

been argued that naturalism nevertheless has a simpler ontological economy, since it posits fewer kinds of entities. (Dawes 2009, chapter 7) Here the debate is again strongly influenced by our philosophy of mind and our general ontological views.

⁶¹⁵ Susskind 2006a, 343.

⁶¹⁶ Leslie 1989, 58-61; Swinburne 2004a, chapter 8.

⁶¹⁷ Behe 2007, 223.

⁶¹⁸ Denton 1998, Behe 2007.

example where the ID movement seems to move between a minimalistic and a more robust conception of the designer.

When the evidence of fine-tuning is stated as a problem of natural good, the relevance of the problem of natural evil – the second naturalistic objection to cosmic design arguments – becomes clear. Defenders of the design argument claim that the fine-tuning of our universe is in excess of that needed for survival, and that this is not explained by the multiverse hypothesis. In this they seem to be correct: the multiverse hypothesis does not explain these other features of the cosmos. The best available response of the multiverse proponent is instead to shift to the attack, and to argue that the theistic hypothesis also does not explain all of the features of the cosmos, particularly the existence of natural evil. The point is made eloquently by the character Philo in Hume's *Dialogues Concerning Natural Religion*, comparing the universe to a poorly built house where tenants live in suffering. Philo argues that the bad outweighs the good in our universe, and that this provides evidence against the claim that the Creator is good.⁶¹⁹ In defending the multiverse hypothesis, the claim that there is more evil than good seems unnecessary. Perhaps it is sufficient to claim that our universe is neither bad nor good but simply mediocre. While the multiverse hypothesis does not explain all of the characteristics of our universe, perhaps the design hypothesis does not either. The evaluation of this argument depends on our views of theodicy and our overall estimate of what sort of cosmos we live in. I will analyse the problem's relationship to design arguments in depth in chapter 9.

Level-shifting and the Need for Explanations

The previous discussion has treated naturalistic explanations and design as competing explanations for the same data. On this understanding, both attempt to explain the natural laws, constants and conditions of the cosmos, and the question is simple which one does it better. However, though interesting for the purposes of argument, this way of stating the question does contain a problem. As several proponents of design arguments have stated, the naturalistic explanations do not seem to be able to answer the question that the theists are asking. Thus it can be argued that design and naturalistic explanation operate on different levels.

For example, consider atheistic one-universe explanations for the fine-tuning. As stated, these rely on finding a fundamental natural mechanism that has the properties needed to produce our fine-tuned universe deterministically. However, as Collins notes, this appears to only move the problem of fine-tuning, since this fundamental natural mechanism would then have to be fine-tuned itself, or it could not produce such a specific outcome. If the question of the origin of fine-tuning was reasonable in the case of our cosmos, then it appears that it should also be reasonable in the case of this fundamental physical

⁶¹⁹ *Dialogues*, chapters X ja XI.

mechanism.⁶²⁰ Thus a proponent of cosmic design arguments can always argue that the designer works on a different level than the laws of physics.

A similar strategy is also available in the case of multiverse hypotheses. Collins has argued that proposed multiverse hypotheses typically require precisely fine-tuned laws of nature to generate the universes and their varying natural constants. The multiverse hypothesis does not explain the existence of the fine-tuning required for a multiverse capable of generating life-supporting conditions. Because of this, Collins argues that the multiverse hypothesis only moves the problem back, and does not eliminate the evidence for the designer.⁶²¹

Ratzsch calls this type of defence of the design argument “level-shifting”, identifying both plausible and implausible examples of level-shifting. On the one hand, suppose that an elderly uncle dies in suspicious circumstances, and relatives suspect the niece killed the uncle. Police investigations, however, reveal a natural cause for the death: the uncle’s medication was mixed up. The relatives can plausibly claim that the niece killed the uncle by mixing up his medication, thus moving their design-explanation up one level. Here the natural explanation does not eliminate the evidence for design. On the other hand, suppose that crop circles (which some UFO enthusiasts suppose are produced by aliens) are proven with video evidence to be made by humans. An UFO enthusiast could respond to this alternative explanation by claiming that the aliens must be mind controlling the humans. However, here level-shifting is clearly implausible.⁶²² The central factor separating plausible and implausible level-shifting in these examples seems to be whether the natural explanation eliminates the reason why the design hypothesis was made in the first place.

Is level-shifting then a plausible strategy in responding to naturalistic counter-arguments in the case of fine-tuning? I would argue that it is, insofar as the naturalistic hypothesis does not eliminate the evidence of design, but only moves it back one level. This seems to be exactly what Collins argues: proposed naturalistic explanations for fine-tuning themselves require fine-tuning to work.

Here the third naturalistic response to design arguments is relevant: perhaps we should simply stop looking for explanation with the ultimate theory of physics or the multiverse, rather than seeking an explanation for it. Perhaps an ultimate theory of physics is not even needed – one could also say that the laws and constants of nature we now know provide the natural stopping point for seeking explanations. The existence of our universe is just a brute fact which we cannot explain. This line of argument does not really try to present an explanation for the properties of natural explanations. Rather, the question is about the legitimacy of the design inference and what the proper stopping point for seeking explanations is.

⁶²⁰ Collins 2012, 256-262; see also Collins 2005a, 184-185. Collins argues that this holds for restricted multiverse hypotheses where the amount of universes is not infinite and eternally existing, not for unrestricted multiverses where all logically possible worlds exist.

⁶²¹ Collins 2005, 185.

⁶²² Ratzsch 2010.

The idea that we should not seek explanations for the order of nature is perhaps best defended with an old Humean argument. In the *Dialogues*, Philo argues that if we can accept the mind of a designer as the stopping point, we can just as well accept the material world as the stopping point to avoid the conclusion of design.⁶²³ The answer of classical theism to this problem has been that God, being existence himself, is capable of being the foundation of reality in a way different from contingent natural laws. One could argue that it is always reasonable to seek further explanations and understanding, until no more can possibly be found. In the case of natural order, we can find a further explanation in divine design. However, because of the properties which this divine designer has, we can't possibly find for any explanations for God. Thus the divine designer arguably forms a more natural stopping point for explanations than the order of nature. This conclusion is also supported if we accept the cosmological argument which infers that contingent beings have their origins in the absolute, necessary being – God. Here it simply does not make sense to ask where God came from, though it does make sense to ask such questions of any contingent being or composite of contingent parts, such as the universe.⁶²⁴

The above response is more credible for someone who accepts the existence of the theistic God, who has just these properties.⁶²⁵ The ID movement, however, claims that its design argument is credible even without assuming God. Thus it needs another strategy for responding to the “who made the designer” -objection. One possible strategy is to argue that evoking the further question of where the designer came from does nothing to invalidate the logic of the design argument as such. The design argument can explain fine-tuning even if it evokes some further questions. They can also appeal to the history of science, where new explanatory factors have frequently been proposed without knowing what explains these new factors. If design is thought to have explanatory value at all, there is no reason to not accept the design hypothesis merely because this then creates additional questions.⁶²⁶ Here the fourth and final naturalistic objection – that design is not explanatory – is relevant, and seems to be the one the whole case for rejecting cosmic design arguments ultimately hangs upon.

I have already argued that the Intelligent Design movement sees evidence for cosmic design as providing one reason for seeking evidence for design from biology, as well. Here the ID movement's rationale is inverse to that of many naturalists, who argue that the evidence from evolutionary biology increases our confidence of finding naturalistic explanations for cosmic design, as well. Richard Dawkins, for example, argues that the success of Darwinism in explaining the appearance of design in biology makes it rational for us to seek such explanations for cosmic order, as well.⁶²⁷ The idea is that the progress of science demonstrates the replacement of intentional explanations with reductionistic and

⁶²³ *Dialogues*, chapter II.

⁶²⁴ See e.g. Feser 2008, Hart 2013 and Spitzer 2010. For some critique, see Mackie 1982, chapter 5.

⁶²⁵ Craig & Copan 2004.

⁶²⁶ Leslie 1989, chapter 5; Lennox 2007, 62-64.

⁶²⁷ Dawkins 2006a.

non-purposeful explanations. Any appeal to design is seen as a “God of the gaps” -argument based on our ignorance of the natural causes which are in fact the only necessary explanation. Victor J. Stenger thus argues that *“the fine-tuning argument and other recent intelligent design-arguments are modern versions of God-of-the-gaps reasoning, in which God is deemed necessary whenever science has not fully explained some phenomenon.”*⁶²⁸ As noted, for some naturalists, confidence in the successes of naturalistic reductionism extends not just to the evidence for cosmic design, but also into explaining our own consciousness.⁶²⁹ Design is not seen as a sufficiently detailed or informative explanation from the point of view of the natural sciences, and so even ignorance is thought to be better than belief in design. I relegate further discussion of these points to the following chapters.

⁶²⁸ Stenger 2006, 184. See further also Stenger 2011.

⁶²⁹ Goetz & Taliaferro 2008.

6. BIOLOGICAL DESIGN

Most of the Intelligent Design movement's literature focuses on biology: on the defence of biological design arguments and on critiques of Darwinian evolutionary theory. In Behe's terms, though it values the cosmic design argument, ID focuses more on finding evidence of design "*beyond the laws of nature*".⁶³⁰ Behe thinks that if there is a designer responsible for the order of the cosmos, and this order is designed for the benefit of life, then it helps make it more reasonable to suppose that the designer may also have directed the development of life inside the universe.

However, there are also differences between cosmic and biological design arguments. In my analysis of cosmic design arguments in the previous chapter, I showed that cosmic design arguments can be defended with "level-shifting". If design-based explanations can be argued to function on a higher explanatory level than the naturalistic explanations employed in the natural sciences, then there does not necessarily need to be a conflict between them. Perhaps a similar argument could be constructed in biology, so that natural explanations and design could be seen as different and complementary modes of explanation. However, in biological design arguments, Darwinian evolutionary biology and design are often seen as competing explanations for the same data. In many ID works, critiquing Darwinism often takes much more space than positive defence of the design argument.⁶³¹

In chapter 4, I considered two different explanations for this strategy. First, because of the intuitive nature of belief in design, the ID theorists sometimes present design as the default explanation for biological order. If Darwinism is seen simply as an attempt to refute this default position, showing that Darwinism does not succeed in explaining biological order would be sufficient to uphold design as the default explanation. The second reason for this strategy comes from the importance of the elimination of rival explanations for many formulations of the design argument. However, I also emphasized that a critique of other explanations does not suffice to defend design as the best explanation without positive reasons for seeing design as a potential explanation by its own merits.

In this chapter, I will analyse the ID movement's biological design argument and the discussion on Darwinian evolutionary theory. The goal of the chapter is to understand the structure of ID's argumentation and the crucial philosophical assumptions in the discussion. I will first discuss the concepts of biological teleology or functional complexity further. I will then go on to analyse ID's understanding of evolutionary theory, with particular attention given to the argument from "irreducible complexity". I will then discuss critiques of ID's arguments in order to lay the groundwork for further analysis in the following chapters.

⁶³⁰ Behe 2001, 696; similarly Dembski 2003.

⁶³¹ For example, see Johnson 1993 and Behe 2006a.

6.1. Biological Design?

Biological “Machinery”

As seen in the previous chapters, design is understood within ID as a teleological cause that functions well as an explanation for teleology in nature. But what does this mean in the case of ID’s biological design arguments? What form does teleology take in biology? As explained in chapters 4.4 and 4.5, the comparison of explanations is central for the ID theorists’ design inference. But before design and evolution can be compared as explanations for the order of life, it should be asked how these explanations work as potential explanations and what they propose to explain.

Though evolutionary biologists and the ID theorists agree that there is something to be explained in nature, it may be that there is some difference in the way this order is described. The central examples of biological order used in the ID movement’s design arguments are examples of (1) functional, apparently purposeful complexity and (2) biological information. The argument based on biological purposeful complexity has been most developed by Michael Behe, and the argument from information has been developed by William Dembski and Stephen Meyer. The elucidation of what exactly is meant by biological “functions” and biological “information” is a thorny problem. Here I limit myself to some general comments on what sort of concepts the ID theorists use and what this implies for their arguments.

In general terms, even something as simple as the color of fur can be a biological adaptation and an example of functional order. Behe focuses on machine-like purposeful complexity, however. His focus is on “irreducibly complex” structures. While Paley argued based on the anatomical features of organisms known in his time, Behe bases his argument on the properties of “biochemical machines” only visible with advanced instruments. According to Behe, “it was once expected that the basis of life would be exceedingly simple. That expectation has been smashed. Vision, motion, and other biological functions have proven to be no less sophisticated than television cameras and automobiles.”⁶³² Behe calls these objects “machines”: “The cumulating results show with piercing clarity that life is based on machines – machines made of molecules!”⁶³³ In *Darwin’s Black Box* (1996), Behe uses five different molecular machines as examples of structures that he argues difficult to explain by referring to Darwinian evolution and that instead require design. His examples are ciliar motors, the blood clotting system, the cellular transportation systems, the immune system and the system for the biosynthesis of the energy molecule amp.⁶³⁴

For Behe, design is “purposeful arrangement of parts”, and this definition applies equally well to man-made artefacts and biological machines.⁶³⁵ This is linked in Behe’s

⁶³² Behe 2006a, x.

⁶³³ Behe 2006a, 4.

⁶³⁴ Behe’s descriptions of these systems have generally been regarded as accurate, though his understanding of the plausibility of evolutionary scenarios has been criticized. See e.g. Perakh 2004, 118-119 & Orr 1997.

⁶³⁵ Behe 2006a, 193.

argument to the property of *irreducible complexity*. According to Behe, an irreducibly complex system is “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.”⁶³⁶ For Behe, irreducible complexity is simultaneously both evidence against Darwinism and evidence for design. He writes that the strength of the design argument is “quantitative and depends on the evidence; the more parts, and the more intricate and sophisticated the function, the stronger is our conclusion of design.”⁶³⁷ Irreducibly complex systems have multiple parts which are arranged for an intricate function. They thus exemplify Behe’s definition of the design as the “purposeful arrangement of parts”. Behe argues that the strength of the design argument is probabilistic, and gets stronger when there is more purposeful complexity, because it becomes progressively more difficult to explain in any way other than design. This is in line with understanding Behe’s argument as an inference to the best explanation. I will focus more on Behe’s argument from irreducible complexity in chapter 6.3. Here I will focus on the idea of biological machinery.

Talk of “biochemical machines” is common in scientific journals. Biologist Bruce Alberts explains that these objects are called machines because “like machines invented by humans to deal efficiently with the macroscopic world, these protein assemblies contain highly coordinated moving parts”, and because terminology used in engineering has proven to be useful in biology.⁶³⁸ Here, the definition of a machine is simply a system composed of several coordinated moving parts, and this definition encompasses both human machines and biochemical machines as machines. Like Behe’s definition of irreducible complexity, Alberts’ definition of a machine references systems which require the coordination of several interacting parts.

However, Massimo Pigliucci and Peter Boudry have argued that the ID theorists use machine-like language more literally than naturalistic biologists. There is plausibility to this claim, because the ID theorists are teleological realists, whereas naturalists are typically teleological reductionists and teleological eliminativists. That is, though Darwinian evolutionary biology recognizes the reality of teleology in biology, it is argued that it is ultimately produced by non-teleological causes. Pigliucci and Boudry argue that calling biological objects machines is a metaphor, useful in the history of science but also misleading in other respects. The usefulness of the metaphor can be seen, for example, in the way the concept of the human heart as a pump was important for William Harvey (1578 –1657) discoveries about blood circulation.⁶³⁹ But Pigliucci and Boudry feel that calling biological structures machines also leads astray, because it easily leads to inferring, by principles of analogy, that biological machines must also be designed. This overlooks the differences

⁶³⁶ Behe 2006a, 39.

⁶³⁷ Behe 2006a, 256.

⁶³⁸ Alberts 1998, 291. Quoted in Pigliucci & Boudry 2010, 6. Dembski (2002a, 247) also quotes Alberts approvingly.

⁶³⁹ Pigliucci & Boudry 2010, 3. Ratzsch 2001 also argues for the usefulness of the concept of design in the history of biology, and claims that this validates the use of the concept even in modern biology, as well as in biological design arguments.

between biological machines and man-made artefacts which make evolution possible. Biological machines are more amenable to change, for example.⁶⁴⁰

So, Pigliucci and Boydry want to avoid calling biological structures machines because they want to avoid giving credibility to the design argument. To state the criticism in terms used in chapter 4, Pigliucci and Boydry believe that understanding biological structures machines is a way of establishing a conceptual and inductive connection between the type of order observed in biology and intelligent design as an explanation. Their critique is that this connection is weak, because organisms are different from machines in a way that enables organisms to evolve. This calls to mind Humean criticisms of the analogical design argument based on the similarities between objects. The question is whether there really is a relevant similarity between biological machinery and man-made machinery. It is argued that there is a relevant difference, because biological machinery is evolvable without design, whereas man-made machinery requires design as its cause.⁶⁴¹

Does Behe use machine-like language in a different way than biologists generally? Given Behe's theistic background assumptions, he has at least the possibility of being a teleological realist, in contrast to many naturalistic views. However, Behe's idea of organisms as literally machines does not seem to be based on this teleological realism, but simply a definition of machines which encompasses both man-made and biological machines. Complex functional systems seem to exist in biology, whether we call them machines or not. Behe does also speak of purposeful complexity in biology, identifying purposes with functions. Here it could again be argued that there cannot be real purposes in biology under naturalism, but only the appearance of purposes. Thus Behe's talk of purposes could be seen as presupposing teleological realism and associated metaphysical ideas. However, this would be a mistake, because Behe himself states that he assumes only the appearance of design, not the reality of purposes in biology. He then posits the purposes of an intelligent designer as the best explanation for this appearance of purposefulness. Behe argues that given this "apparent design" in biology, it is a rational conclusion to say that the design is not only apparent but real. An intelligent designer created the apparent design in biology.⁶⁴²

How then does Behe identify the purpose of a given biological system? Behe's definitions reveal that his definition of purpose is immanent to the system under analysis. According to him, "*the function of the system we must look at is the one that requires the greatest amount of the system's internal complexity. The function of a system is determined from the system's internal logic: the function is not necessarily the same thing as the purpose to which the designer wished to apply the system.*"⁶⁴³ He then explains this immanent purposefulness based on the purposes of the intelligent designer. Following these definitions, we may separate between two levels of purpose in intelligent design theory. First (1), there is the purpose of the designer in designing a given object, which, Behe argues, is unknown without a

⁶⁴⁰ Pigliucci & Bouydry 2010. For similar views, see Shanks 2003 and Ruse 2003.

⁶⁴¹ See chapter 7.1 for more on the design argument as an analogical argument.

⁶⁴² Behe 2006a, 265.

⁶⁴³ Behe 2006a, 196. Emphasis in the original.

revelation from the designer. The designer must have purposed to create the known functions of the system, but he may have had other purposes for the system as well. As seen in the previous chapters, the ID theorists do not believe that a hypothesis of the designer's precise motivations in designing the object is necessary for the design argument. Second (2), there is purposeful complexity of the object which, it is argued, we can reliably infer to have a certain function.⁶⁴⁴ Behe argues that a system can have many different effects in nature. The function of a system seems then to be some state of affairs brought about by the system which requires the greatest amount of the system's internal complexity to bring about.⁶⁴⁵ This idea of identifying function does not seem very controversial or problematic – recall the idea of testing teleological descriptions discussed in chapter 3.2. The controversy is about whether ID is a good potential explanation of the data or the best explanation of it, not about whether biological structures are amazingly complex and functional.

Biological “Information”

I have argued that the biological functional and machine-like complexity form the first important type of biological order which the ID theorists believe is best explained by design. The second type of order is formed by biological information. Stephen Meyer has argued that the genetic information in DNA is a “signature in the cell”, strong evidence of intelligent design in biology.⁶⁴⁶ Some concept of information is generally thought to be essential to modern biology. The genetic information of DNA is needed for all of the vital functions of life, since organisms need it to produce all of the proteins they need for their molecular machinery and various tasks. In addition to the information required for building proteins, information is also needed for directing the development of the organism. Developmental biology is just beginning to unravel the secrets of animal developments, but there is research on genetic regulatory networks and epigenetic information (hereditary information residing outside the DNA) which govern the development of the biological form of animals, such as the growth of a human embryo into an adult.⁶⁴⁷

The main two definitions of information used by the ID theorists are statistical (or causal) information, and specified information. In modern information theory, following Claude Shannon (1948), the concept of information can be used to quantify the amount of information into units called “bits”. The initial use of Shannon's ideas was in

⁶⁴⁴ Ariew (2002, 8) has argued that Intelligent Design argues for the existence of Platonic extrinsic teleology on the basis of Aristotelian immanent teleology. The quotes in the main text confirm Ariew's interpretation.

⁶⁴⁵ Behe 2006a, 196. In Behe's text, the requirement of “greatest internal complexity” is there to avoid mistakenly thinking that some effect which does not require much of the system's complexity is its main function. Behe limits his analysis to biochemical systems partly because he thinks that this enables us to reliably infer the system's basic function. In more complex systems, identifying the main function is difficult, because these systems tend to be composed of many subsystems, each with their own function.

⁶⁴⁶ Meyer 2010.

⁶⁴⁷ See Noble 2008 and Noble 2013 for two fine and interesting popular accounts of this change.

communications technology, in analyzing the way messages can be compressed and transmitted. Information signifies a correlation between some two states of affairs. With such a broad definition, information can be seen everywhere. There is a causal connection between genetic information and the structure of proteins, and this can be described as information. However, there is also an informational connection between smoke and fire, for example.⁶⁴⁸ So this definition of information is quite broad and does not seem to provide grounds for seeing a connection between information and design, as required by ID's design argument. This definition of information also does not include references to any semantic content a series of symbols has. Thus, as Meyer notes, a completely random sequence of symbols can have more information content when measured with Shannon information than a meaningful sequence.⁶⁴⁹

The second kind of information as understood by the ID theorists is specified information, meaning information which fits a predetermined pattern, such as the fulfilling of a function. Again, the terms "specified information" and "specified complexity" are based on Dembski's analysis of the concept of information, though the terms have not originated with the ID movement.⁶⁵⁰ Meyer too uses the concept of specified information when describing biological information, but uses the terms in a very general sense as a synonym for "functional information", and does not utilize the technical apparatus developed by Dembski in his writings in detail.⁶⁵¹

In addition to containing a function, the information in DNA also shared some other similarities with codes produced by humans. The ID theorists compare DNA with computer code. Computers store all information as series of zeroes and ones. DNA, by contrast, has four different "letters". These are the bases thymine, adenine, cytosine and guanine. The information about what sequence of amino acids are needed to produce the proteins needed by the cell is stored in the sequence of these four letters. The four letters form codons which are three letters long. There is a complex translation and transcription machinery in the cells which forms proteins on the basis of this sequence. There are markers in the DNA for the translation machinery, so that it can find the code for the required protein from the genome. Each codon is translated into an amino acid, and the resulting chain of amino acids is formed into a protein.⁶⁵²

According to many biologists and information-theorists, DNA appears to be written in a language and requires translation to discover its function, just like computer code is written in a language. Like any language, there does not appear to be any necessary connection between the genetic code and the sequence of amino acids which is selected. The code seems arbitrary. The translation system could well also be set up differently, and the

⁶⁴⁸ Godfrey-Smith 2007, 106.

⁶⁴⁹ Meyer 2009, chapter 4.

⁶⁵⁰ Dembski 2002a.

⁶⁵¹ Meyer 2013, 168.

⁶⁵² Meyer 2009, chapter 4. Meyer's accuracy in these basic biological facts has not been questioned in the discussion. For basic information on the cell and genetics, see Campbell & Reece 2007, chapters 13-18.

meaning of the codons could be changed. The same information could be expressed in many different ways. There are some examples of slightly different genetic codes in different biological organisms, and the information contained in DNA can also be expressed in human language. Meyer also emphasizes that the code is not reducible to the chemical interactions of the chemicals which form DNA. No physical law causes thymine, adenine, cytosine and guanine to form into a particular sequence. This makes it possible to form a wide variety of different codes using these four letters.⁶⁵³

In Meyer's view, this means that information is in some sense irreducible to mere chemistry and thus the origin of the system is better explained by intelligent design than naturalistic theories of the origin of life. The functional information is also structured and controlled by regulatory networks, which in Meyer's view closely resemble the complex purposeful programmes that intelligent designers can create. According to Meyer, we have experience linking intelligent design and this type of coded information systems, but no experience which would enable us to infer that natural causes can create systems like this. For Meyer, this makes ID a better explanation for the origin of life. The form of his explanation is the inference to the best explanation as stated in chapters 4.4 and 4.5.⁶⁵⁴

I will analyse the ID movement's critique of Darwinian evolutionary theory further in chapters 6.2 and 6.3. For now I want to discuss some issues in these definitions of information. As in the case of the machine-like complexity of biological order, the terms used by the ID movement to describe biological information as encoded information, as building instructions and even as a genetic programme are ubiquitous in biology.⁶⁵⁵ However, some critics of ID have questioned the literal application of these terms to biology. In response to ID, philosopher of biology Peter Godfrey-Smith distinguishes between three different applications of informational concepts:

- (1) The description of whole-organism phenotypic traits (including complex behavioral traits) as specified or coded for by information contained in the genes;
- (2) The treatment of many causal processes within cells, and perhaps of the whole-organism developmental sequence, in terms of the execution of a *programme* stored in the genes;
- (3) The idea that genes themselves, for the purpose of evolutionary theorizing, should be seen as, in some sense, "made" of information. From this point of view, information becomes a fundamental ingredient in the biological world.⁶⁵⁶

According to Godfrey-Smith, the first of these theses is the most well-founded, but it remains possible to question the other two. Godfrey-Smith agrees that on the level of DNA, a limited

⁶⁵³ Meyer 2009, chapter 4; similarly Campbell & Reece 2007, chapters 15-18.

⁶⁵⁴ Meyer 2013, chapters 13 and 14.

⁶⁵⁵ This is attested to by both critics of and defenders of ID. (E.g. Godfrey-Smith & Sterelny 2008, Meyer 2009).

⁶⁵⁶ Godfrey-Smith 2007, 103-104.

sort of semantic information is required, but argues that this is yet a very limited concept of semantic information, far removed from the robust semantic information produced by humans. For Godfrey-Smith, Shannon information succeeds in describing most of biological information.⁶⁵⁷ For Godfrey-Smith, the ID movement makes an error in equating the type of information found in biology with the type of information humans produce. The critique is similar to what we saw above in the case of machine-metaphors. Critics argue that the ID movement is taking analogies too far in concluding that information is best explained by an intelligent source.

The ID movement's information-based design argument is stronger if information can be understood to be present in biology in a stronger sense than just functionality. If we can justifiably claim that organisms have a teleological tendency to develop a certain type of form, and that the development of the organism is guided by some kind of information, whether genetic or epigenetic, then this does seem like the sort of teleology that is congenial to the ID movement's argumentation. If there is a strong analogy between human-produced information and biological information, then this also strengthens the design argument, particularly if it can be argued that information is something irreducible to physics and chemistry. If the analogies are not as strong, then the information argument can be understood as just a subset of the more general argument from functional complexity. In the case of biological machinery, I argued that the ID movement merely needs to suppose the appearance of teleology in biology. It can then argue for the reality of teleology as the best explanation for this appearance. The functionality and apparent teleological nature of the information encoded in DNA may be sufficient to make it another example of teleological order which is not completely arbitrary to explain by reference to design, thus getting the ID movement's design argument moving.

In addition to the teleological order of biological organisms, proponents of ID have also sometimes pointed to other features of biological nature which they believe are best explained by intelligent design. First (1), it has been argued that the fossil record reveals the abrupt appearance of new organisms in the fossil record. Since intelligent designers typically produce new order very quickly, Stephen Meyer argues that intelligent design explains such abrupt appearances better than evolutionary theory. Second (2) ID is also argued to predict some amount of similarity between organisms, since designers often re-use functional components in different designs. The similarities between different organisms also form an important class of evidence for evolution, as we will see in chapter 6.2, but the ID theorists argue that the pattern of life is better explained by design. Third (3), ID is argued to better explain the level of biological perfection seen in nature. This argument may be in tension

⁶⁵⁷ Godfrey-Smith 2007, 110; 2007b. See also Yockey 2005 for an account of information in biology that accepts quite a strong definition of information but is nevertheless critical of ID. Denis Noble (2008) and other expanders of the modern synthesis also argue that the focus on genes is misplaced. Teleology is in the entire structure of the organisms, not merely in the genes. Meyer's newer work (2013, chapters 13 and 14) shows that he is cognizant of these new developments.

with the ID theorists' responses to the problems of bad design and natural evil. I will come back to this third point in chapter 9.2.⁶⁵⁸

In these three cases, the logic of the ID theorists can be formulated as an argument to the best explanation supported by our inductive experience about what intelligent designers generally do. I have argued that there is justification for connecting teleology with designers, but what about these other features? It seems to me that here the connections are much more fragile. We also know from experience that designers can sometimes take a long time to produce something new and do this through many iterations (contra 1), though designers do not typically indeed need millions of years for their work. Furthermore, we know from experience that designers often strive for originality and can produce tools which are unique and only suited for one task (contra 2), and that designers often make errors and produce imperfect designs and barely working junk (contra 3). Here the predictions of the general hypothesis of intelligent design seem weaker than in the case of teleology. It seems that to produce such predictions, a more specific hypothesis of intelligent design would have to be defended.

It may be that the ID theorists making these predictions do have such a hypothesis in mind or are unconsciously guided by their Christian expectations of God. For example, perhaps a perfect, miracle-working God could indeed be expected to create perfect life forms abruptly, and perhaps this God could also have a motive for creating similar forms of life. For example, perhaps he does not want us to think that there are many creators. Perhaps a variety of completely different life forms might cause us to believe that there must have been many different creators, rather than one.⁶⁵⁹ But this type of hypothesizing about the nature and motives of the designer also has its problems. Many different hypotheses about the designer could be made. For example, others have posited that we should rather expect the Christian God to create life forms through a gradual process of evolution, rather than through miracles.⁶⁶⁰

In order to make use of their more detailed predictions about what we should expect from the intelligent designer, it seems that the ID movement will have to present and defend a more specific understanding of the nature of the intelligent designer and perhaps even get into this theological discussion. One way of arguing for such a more robust design hypothesis that might not necessary require in-depth theological arguments would be by trailing the data, as I argued in chapter 3.3. Over time, in observing an agent's activity, we can form an opinion of the characteristics of this agent. For example, the expectation that the designer would create perfect designs could be based on the observation of some designs that we believe are perfect or at least close to perfection. However, if this is the intention of the ID movement, then it would be interesting to see such a more robust design hypothesis

⁶⁵⁸ Luskin 2013.

⁶⁵⁹ The creationist Walter ReMine defends a theory like this in his book "The Biotic Message" (1993).

⁶⁶⁰ See chapter 7.2 of the present study.

openly defended. Currently it seems that the ID movement is still moving between such a more robust designer and the minimalistic designer in its argumentation.

6.2. Understanding Evolution

Evolutionary Biology and Intelligent Design

In the previous chapter, I have briefly explained some features of life which the ID theorists see as evidence of design. But as noted, the ID movement's biological design arguments include critiques of naturalistic explanations of the biological order of nature. Darwinian evolutionary theory agrees with ID that the functional complexity of biology requires an explanation – the explanation given is just different. But what exactly is Darwinian evolutionary theory and what parts do the ID theorists accept or reject?

Ernst Mayr, one of the 20th century's leading evolutionary biologists, divided Darwinian evolutionary theory into five distinct parts. First, (1) there is the general thesis of evolution as such. This states the changeability of species as opposed to a constant, unchanging world. Second (2), there is common descent, the thesis that all different branches of animal species share a common ancestor. Third (3), there is the thesis of gradualness, which states that species change by small, successive and cumulative mutations. Thus there are no big "jumps" in evolution where a completely new form of animal is formed through just one mutation. Fourth (4), there is the thesis of populational speciation, which states that new species can emerge from existing populations through changes. Fifth (5), there is natural selection – the Darwinian mechanism for explaining evolutionary adaptations.⁶⁶¹ As Mayr argues, it is in principle possible to accept just parts of Darwinian evolutionary theory. For example, many of Darwin's contemporaries did not accept natural selection as the mechanism of evolutionary change, but accepted the thesis of common descent.⁶⁶² Modern expansions of the evolutionary synthesis also tend to modify one of these parts. For example, there are different views about the relative importance of natural selection and how large the mutations can be.⁶⁶³

There is a broad variety of different views within modern evolutionary biology, as well. Recent discussion on evolutionary theory has complicated the picture. For example, there has been discussion of evo-devo, neutral evolution, endosymbiosis, punctuated equilibrium and even "natural genetic engineering" as complementary mechanisms to Darwinian natural selection.⁶⁶⁴ However, the standard Darwinian mechanism is typically still

⁶⁶¹ Mayr 2002, 94-95.

⁶⁶² Mayr 2002, 95. See also Bowler 2009, chapters 6 and 7, particularly pages 196-199.

⁶⁶³ Pigliucci & Muller 2010.

⁶⁶⁴ See e.g. Cunningham 2010, Cobb 2008 and Noble 2013 for discussions emphasizing the breadth and continuing development of evolutionary theory; see Shapiro 2011 & Wilkins 2012 for discussion on natural genetic engineering.

seen as the only way to explain the presence of complex biological adaptations, such as the eye which appears to be formed for the purpose of sight and other such examples of biological “teleology” or whatever name we wish to use of this feature of life.⁶⁶⁵

In any case, Mayr and the mainstream of current evolutionary biologists still regard accepting the whole package of Darwinism as the most consistent and scientifically reasonable thing to do. New developments in evolutionary biology are seen as supplementing the basic naturalistic picture of neo-Darwinism rather than overthrowing it and returning to a Paleyan understanding of the origin of species. Evolutionary biologist Mark Ridley summarizes four main lines of evidence for Darwinian evolutionary theory.⁶⁶⁶ First, (1) small scale changes in organisms can be directly observed. It is then extrapolated that past changes in organisms can be explained through the same evolutionary mechanisms observed in the present. Second (2), the similarities of living things can be explained by the proposition that they are descended with modification from a common ancestor. Such similarities can be seen both in the appearance (phenotype) and the genetic structure (genotype) of organisms. The classification of living things into different species and classes by pre-Darwinian biologists was historically necessary for the emergence of Darwinian theory. It then became possible to argue (for example) that all different cats were descended from the same cat-like ancestors, all mammals from the same ancestors and so on.⁶⁶⁷ Third, (3) the geological evidence demonstrates that past forms of life were different from those that now live, and fits well with the supposition of descent with modification. Fourth (4), evolutionary biology acts as a unifying theory for all of biology and helps explain many details which seem to be without any other explanation.⁶⁶⁸ As Theodosiuz Dobzhansky famously stated in 1974, “*nothing in biology makes sense except in the light of evolution.*”⁶⁶⁹ Dobzhansky admitted that not all details about how evolution happens have been worked out, but this should not stop us from accepting the general picture given by the theory as correct. The logic of the inference to the best explanation does not demand that all questions related to a hypothesis are resolved before it can emerge as a clearly better explanation than any rival hypothesis.⁶⁷⁰

⁶⁶⁵ E.g. Freeman & Herron 2007, 98-99. Even Fodor & Piattelloi-Palmarini (2011, chapter 8) recognize in their critique of neo-Darwinian theory that this is the strongest argument in favour of the importance of natural selection; similarly Cunningham (2010, chapter 3) notes the importance of natural selection in explaining adaptations, while otherwise emphasizing the importance of other factors in evolution.

⁶⁶⁶ Ridley 2004, 66. There are other ways of summing the evidence for evolution. Campbell and Reece (2007) add the evidence from biogeography to this list: similar animals live close to each other. This is better explained by assuming that these species have a history of common ancestry and migration, rather than assuming that all species are created by God in the places which they are found.

⁶⁶⁷ See Bowler 2009, chapter 3 for this history. See also Freeman & Herron 2007, Dawkins 2009 and Coyne 2009 for presentations of the evidence for common descent.

⁶⁶⁸ As Dawes (2007, 80) notes, there is massive amount of research in evolutionary biology. It is now over 140 years from the publication of *Darwin's Origin of Species* (1859) and evolutionary biology has since been worked on by generations of biologists.

⁶⁶⁹ Dobzhansky 1974.

⁶⁷⁰ Lipton 2003, Sober 2008.

In addition to these four reasons, many defenders of evolutionary biology also reference philosophical and theological arguments as powerful reasons for accepting Darwinian evolutionary biology over any idea of creation involving miracles and gaps in nature. I will analyse some such reasons further in chapters 7, 8 and 9.

The ID movement's critique of evolutionary biology is mostly aimed at the sufficiency of the Darwinian mechanism for explaining the origin of complex functional order in life (part 5 in Mayr's division above). As John G. West puts it, "*intelligent design is simply the effort to investigate empirically whether the exquisitely coordinated features we find throughout nature are the result of an intelligent cause rather than a blind and undirected process like natural selection.*"⁶⁷¹ All of the ID movement's main thinkers similarly affirm the compatibility of common descent and ID's biological design arguments. This theme is already present in Johnson's *Darwin on Trial*⁶⁷², and continues in later ID works. Dembski, for example, argues that "*intelligent design is also fully compatible with large-scale evolution over the course of natural history, all the way up to what biologists refer to as "common descent" (i.e., the full genealogical interconnectedness of all organisms.)*"⁶⁷³ The reason for this is that the thesis of common descent does not by itself provide any explanation for biological adaptations, and thus does not compete with design as an explanation, whereas the Darwinian mechanism is understood to compete with design.⁶⁷⁴

However, Behe is the only major ID theorist who actually believes in common descent as the best explanation of the similarities of living beings and who restricts his critique to naturalistic mechanisms of evolution. All of the other major ID theorists do recognize Behe's position as coherent and as part of ID. However, they also make extended critiques of standard evidence for common descent, including ID textbooks like the *The Design of Life* (2007) by Dembski and Jonathan Wells.⁶⁷⁵ This critique is thus a part of ID, but the major ID theorists do not consider it a necessary part of ID's project or its design argument. Therefore I will leave discussion of the first four parts of Mayr's thesis aside and focus on the central question of natural selection as the mechanism driving the evolution of new functional structures.⁶⁷⁶

⁶⁷¹ Gauger, Axe & Luskin 2012, 11.

⁶⁷² Johnson (1993, 4) argues that one can be a creationist in the broad sense and accept evolution, as long as one believes that the process of evolution was directed by God.

⁶⁷³ See also Meyer 2010. I will have more to say about ID's relationship to theistic evolution in chapter 8.

⁶⁷⁴ The ID theorists' engagement with evolutionary mechanisms other than the standard neo-Darwinian account has been limited. Behe's analysis of Lynn Margulis' theory of endosymbiosis (2006, 26-31) and evo-devo (2007, chapter 9) is one exception.

⁶⁷⁵ Jonathan Wells' (2002a and 2002b) critiques of standard evidences for common descent are among the deepest in the ID movement.

⁶⁷⁶ Though many sources (e.g. Mayr 2002, Bowler 2009) argue that the idea of common descent was historically acceptable without accepting the other parts of Darwinian evolutionary theory such as gradualism and natural selection, Korthof (2005) argues that there is tension between Behe's acceptance of common descent and his rejection of the Darwinian mechanism as the explanation for macroevolution. Common descent, gradualism and the Darwinian mechanism fit in well together, but I find Korthof's argument unpersuasive. It seems that other evolutionary theories also imply some degree of discontinuity between parents and their offspring, as long as there is change from generation to generation.

According to evolutionary biologists Stanley Freeman and Jon C. Herron, evolution by natural selection is the logical outcome of the following four facts. First (1), individuals vary in most or all traits. Second, (2) some of this variation is genetically based and can be passed on to offspring. Third (3) there is differential reproduction: some organisms are more successful than others in passing on their genes. Fourth (4), reproductive success is not completely random. Rather, the better adapted (or more fit) individuals in the population will reproduce the most.⁶⁷⁷ But this results only in a proving a very general definition of evolution defined as a change in the genetic makeup of the population over time. This definition does not yet tell us what sort of variations occur and whether the cumulation of these variations over time can explain even complex, functional biological structures. One of the best discussions of this is still Richard Dawkins' classic *The Blind Watchmaker* – also a central text discussed by the ID movement.⁶⁷⁸

The ID movement's thinkers admit the powers of naturalistic evolutionary mechanisms in explaining minor changes, but do not accept them as a sufficient explanation for all of life's complexity. In other terms, at issue is the extrapolation from microevolution to macroevolution.⁶⁷⁹ According to Johnson, "If empiricism were the primary value at stake, Darwinism would long ago have been limited to microevolution, where it would have no important theological or philosophical implications."⁶⁸⁰ In the ID movement's terminology, microevolution is "small-scale genetic and structural changes in organisms", whereas macroevolution means large-scale genetic and structural changes "leading to new and higher level of complexity."⁶⁸¹ In the *Edge of Evolution* (2007), Behe attempts to determine the limits of Darwinian evolutionary mechanisms and concludes that Darwinian evolution is likely possible beyond the species level and the limits of Darwinian mechanisms are somewhere on the levels of animal genera, families and orders. For the ID theorists, the boundaries of the system of classification are not what limit the possibilities of the Darwinian mechanisms. Rather, the argument is that though this mechanism can explain some features of life, there are many features which it cannot explain. Thus Behe writes that "the major architectural features of life – molecular

⁶⁷⁷ Freeman & Herron 2007, 105.

⁶⁷⁸ For example, Freeman & Herron (2007, 98-99) and Ridley (2004, 70) direct the reader to Dawkins for the best defence of the powers of the Darwinian mechanism and reference Dawkins' ideas about evolution as the "blind watchmaker."

⁶⁷⁹ The distinction is also common in creationism. See Ratzsch 1996, 86-90. For an example within ID see Dembski & Wells 2007, 102-104.

⁶⁸⁰ Johnson 1993, 118.

⁶⁸¹ Dembski & Wells 2007, 315-316. Unfortunately there are several different ways of making the distinction between microevolution and macroevolution, leading to misunderstandings. In the standard terminology of evolutionary biology, microevolution refers to the evolutionary change within the species, while macroevolution refers to evolutionary change above the species level. However, the biological species line (meaning a reproductively isolated population) can be crossed without changes that the ID theorists would term macroevolution. (Dembski & Wells 2009, chapter 4). Nevertheless, similar broader definitions of micro- and macroevolution are also used within the philosophy of biology, and the question is typically seen as a valid one. (See Sepkoski 2008 for discussion)

machinery, cells, genetic circuitry, and probably more – are purposely designed. But the architectural constraints leave spandrels that can be filled with Darwinian adaptations."⁶⁸²

Philosopher of biology David Sepkoski formulates the basic question in the move from micro- to macroevolution as follows: *"Do major taxonomical groups represent real, ontologically distinct entities with their own emergent properties, and are the factors that govern their development discontinuous with the mechanisms that produce variation and fitness among individuals?"*⁶⁸³ In the typical usage of the terms in Neo-Darwinian biology, macroevolution has been understood as the same process as microevolution, only on a bigger scale. In this understanding, there is no qualitative difference between microevolution and macroevolution. Rather, if there is a sufficient amount of time, microevolution can lead to macroevolution without the need for further mechanisms.⁶⁸⁴ It is tempting to see a parallel between the arguments for natural selection and design as the best explanations for functional biological complexity. In chapter 4, I argued that ID's design inference is best formulated as an inference to the best explanation where inductive and analogical arguments are used to support design as an explanation. Similarly, natural selection can be defended as the best explanation of functional biological complexity, and its capabilities for explaining this type of order can be defended using inductive arguments, just as is done for design. The Darwinian mechanism is observed to do similar work on a smaller scale today; therefore we can infer that it has the capabilities required for producing macroevolutionary changes given a much larger amount of time. This comes very close to the way the case for the Darwinian extrapolation is often made.⁶⁸⁵

There are some important differences in the arguments for the Darwinian mechanism and design, however. Both the ID theorists and the Darwinians agree that the existence of the Darwinian mechanism in the past is not in doubt. The existence of the Darwinian mechanism is guaranteed by the existence of variation, inheritance and differential reproduction, as we saw above. Darwinian evolutionary biologists also argue that this mechanism fits with what we know about the progress of evolution from fossils and homological evidence, though ID theorists argue that these do not demonstrate the mechanism of evolution.⁶⁸⁶ By contrast, as I showed in chapters 4.4 and 4.5, design arguments are often critiqued for lack of independent

⁶⁸² Behe 2007a, 202.

⁶⁸³ Sepkoski 2008, 212.

⁶⁸⁴ Sepkoski 2008, 213-216. As Sepkoski notes, there is some dispute about whether the (well-evidenced) mechanisms of microevolution can be extrapolated to also explain macroevolution. The majority opinion within evolutionary biology is that the extrapolation can be made, but there is a growing number of biologists who would supplement the basic Neo-Darwinian understanding with other mechanisms. These include appeals to mechanisms working on a larger scale, such as selection on the level of groups and species rather than individuals, large-scale events such as extinctions, epigenetic evolution, macromutations, endosymbiosis, structural constraints and other factors.

⁶⁸⁵ E.g. Ridley 2004, 54-55.

⁶⁸⁶ Ridley 2004, 54-55. Behe 2006a, 22: *"The fossil record has nothing to tell us about whether the interactions of 11-cis-retinal with rhodopsin, transducin and phosphodiesterase could have developed step-by-step."* The existence of natural selection is already accepted by Phillip Johnson in his *Darwin on Trial* (1993, chapter 2). Though Johnson discusses the critique that natural selection is a tautology and meaningless, he goes on to state that it can be formulated in a meaningful way and indeed works in explaining microevolution.

evidence of the designer's existence and characteristics. For the ID theorists, the crucial question is not the existence of natural selection in the past, but the causal powers attributed to it. The reliability of the extrapolation from microevolution to macroevolution is denied. The observed evolutionary changes are not thought to demonstrate the possibility of much larger or qualitatively different evolutionary changes through the same mechanism.

ID and Macroevolution

But what is it that, in the ID theorists' view, stops the processes of microevolution from leading to macroevolution? How do the ID theorists justify their rejection of the Darwinian mechanism's capabilities for macroevolution? Their basic idea is that though small gradual changes are known to produce some positive changes in modern-day organisms, explaining all of life's features through the same process is difficult. I will now summarize four features of biological order the ID theorists believe are resistant to Darwinian explanations. These are (1) irreducibly complex molecular machines, (2) proteins and genes, (3) animal body plans, and (4) the pattern of the fossil record.

(1) *Irreducibly complex molecular machines*. Both critics and defenders of ID have identified Behe's irreducible complexity (IC) as ID's most central argument against the Darwinian extrapolation.⁶⁸⁷ Behe focuses on biochemical machines which he believes are not credibly explained by a gradual process, because producing the function of these machines requires the interaction of several fine-tuned parts. In recent ID literature, there seems to be a move away from using IC as the central ID argument. Rather, the ID theorists are starting to argue that producing even one part of an IC machine is beyond the capabilities of the Darwinian mechanism. IC is then used to argue for the severity of the problem – if producing even one new protein is beyond the capacities of the Darwinian mechanism, then surely producing a new machine requiring tens of such proteins is utterly incredible.⁶⁸⁸ I will have more to say about this argument and its critique in chapter 6.3.

(2) *Proteins and genes*. Proteins are the basic building blocks of life. For example, the parts of the biochemical machines described by Behe's argument are proteins. Proponents of ID argue that new proteins are themselves beyond the capacities of evolution. Based on research into protein evolution, Douglass Axe and Ann Gauger have argued that the structures of many proteins are very sensitive to changes. The amino acids have to be in the right places for the protein to fold into a functional three-dimensional form. While proteins can sustain some mutations without breaking, too many changes result in the loss of protein function. Axe estimates that only about $1 / 10^{64}$ protein folds are functional. If this is correct, then explaining the emergence of new protein folds through a random search is

⁶⁸⁷ E.g. Shanks 2003, 160. and Woodward 2003, 155. The argument from irreducible complexity takes much space in many sources both for and against ID. For examples, see Dembski 2002a, chapter 5; Shanks 2003, chapter 5; Dawkins 2006, 144-150; Miller 2002, chapter 5.

⁶⁸⁸ E.g. Gauger, Axe & Luskin 2012; Meyer 2013, 205-206.

implausible.⁶⁸⁹ Axe admits that random mutations can make small beneficial changes to existing proteins. However, he argues that the mutation experiments he performed with Ann Gauger show that changing the protein's basic structure in this way is mathematically beyond the capabilities of the Darwinian mechanism in the timescales available on Earth, because it would require many coordinated mutations.⁶⁹⁰

Typically critics of this argument admit that the rarity of protein folds does demonstrate the difficulty of random evolution, but argue that evolution does not have to rely on a completely random search. Even if protein folds are rare, it could be that the distance from one functional protein fold to a new protein fold does not require one to search through the entire realm of possibilities, which could make the odds of generating new proteins much better. Though evolving new protein forms from modern-day proteins is difficult, it may be that ancestral protein forms were more malleable. Similarities among current proteins are interpreted as evidence of their evolution through natural selection.⁶⁹¹

A related difficulty is posited by Behe, who argues that developing new proteins would require mutations that increase the functional specificity of proteins. However, Behe argues that such mutations appear to be extremely rare. According to Behe's review of the literature, most beneficial mutations degrade functional specificity or do not increase it and the accumulation of such mutations would not lead to the evolution of new functional protein structures over time. This is another way to argue for a difference between microevolution and macroevolution.⁶⁹² Meyer also uses Behe's arguments from population genetics to buttress the argument against protein evolution. According to Behe, if some feature requires the emergence of multiple mutations at the same time, then its emergence will require ever more time and larger population sizes. Behe calculates that any feature requiring more than two simultaneous mutations is too unlikely for the use of Darwinian evolutionary mechanisms.⁶⁹³

Some other calculations of the frequency of mutations are more optimistic, but still seem to make the waiting time for two mutations too long for Darwinian evolution.

⁶⁸⁹ Axe 2004, 2010a, 2010b, 2011, 2012.

⁶⁹⁰ Gauger & Axe 2011; Gauger, Axe & Luskin 2012; Leisola & Turunen 2007.

⁶⁹¹ E.g. Wood (2011), Myers (2011), Matzke 2013. Carroll, Ortlund & Thornton (2011) is a study hypothetically reconstructing some postulated ancestral protein forms. In response, Gauger (2012) has argued that if the minor changes Axe and Gauger (2011) tried to generate in their experiments is impossible for the Darwinian mechanism, then this reveals the weakness of the Darwinian mechanism and its dependence on the fine-tuning of the fitness landscape. ID theorists also argue that ancestral proteins could not have been much more malleable, because then they would have lacked the specificity necessary for function. (e.g. Berlinski 2013). ID theorists also argue that orphan genes without homologues are difficult to explain in this way. On orphan genes, see the review article by Tautz and Domazet-Lošo (2011) and Meyer's comments (2013, 215-216.)

⁶⁹² Behe 2010a; a previous paper in the same vein is Behe 2004b. In response, Coyne (2010) argues that though Behe's research describes the mutations observed in the laboratory well, we have indirect evidence that the mechanism of gene-duplication, mutation and selection can produce gains of function in nature. Miller 2007a and 2007b as well as Farmer & Habura 2010 are examples of other responses to Behe's thesis. Behe's responses can be accessed through Michael Behe's blog (behe.uncommondescent.com); see e.g. Behe 2007b, 2007c, 2007d and 2010b.

⁶⁹³ Behe 2007a.

Discussion is ongoing.⁶⁹⁴ The best response to the argument seems to be to say that Darwinian evolution does not generally require any coordinated mutations to produce new beneficial traits. The preceding arguments about the necessity of coordinated mutations for the emergence of new proteins and irreducible complexity are designed to make such a response difficult, and so the validity of the argument from mutations hinges on the success of the other arguments.⁶⁹⁵

(3) *Animal body plans*. The ID theorists generally focus on the level of biochemical complexity which is not visible to the naked eye. However, there are several ID-arguments that focus on the difficulty of developing animal body plans in a gradual Darwinian manner. First, the argument from irreducible complexity can be formulated again on the level of body plans. Though natural selection is thought to be able to alter the body plans slightly, developing a new type of body plan is argued to require too many coordinated simultaneous changes to be possible for natural selection. For example, developing an eye would not only require developing the eye, but would also require developing a nerve connecting the eye to the brain and an ability to process the visual information gathered by the brain. Small gradual changes to existing body plans are thus argued to be unable to change body plans entirely.⁶⁹⁶ Formulated in this manner, the argument is quite old and resonates with the typological conception of species used by pre-Darwinian biologists.⁶⁹⁷ Darwinian biologists starting with Darwin himself have had much experience in answering arguments like this on the anatomical level. The argument from irreducible complexity on the biochemical level is partly an attempt to sidestep these Darwinian arguments. I will come back to these questions in chapter 6.3.

The ID theorists also make some arguments about the difficulty of developing new body plans, however. These are based on the insights of developmental biology. First, it is also argued that developmental biology shows that only mutations which affect the early development of organisms could conceivably lead to the evolution of wholly new body plans. However, mutations affecting early development are typically extremely harmful or even deadly. Though mutations in control genes (like HOX genes) can create large changes in the organism's body plan, no known beneficial mutations like this are known. Rather, known examples of beneficial mutations only affect later development. But the accumulation

⁶⁹⁴ Behe (2007a, 61) estimated that though the occurrence of two coordinated mutations by random chance is rarely feasible in bacterial populations, the emergence of such a mutation in humans would take 100 million times 10 million years. In response, Durrett & Schmidt (2008) estimate that it would only take 216 million years in humans. See also Behe 2009 for Behe's response.

⁶⁹⁵ On the origin of new genes and ID, see also the review article by Long, Betrán, Thornton & Wang 2003 and Meyer's comments (2013, 211-229.)

⁶⁹⁶ E.g. Behe 2007, chapter 9; Denton 1998, chapter 14; Dembski & Wells 2007, 102-109; Axe 2012, 39-43; Nelson & Gauger 2011.

⁶⁹⁷ Denton 1986, chapter 5; Denton 2013. See also Bowler

of beneficial mutations which happen late in development cannot even in principle lead to the evolution of wholly new body plans.⁶⁹⁸

Second, the ID theorists reference research on genetic regulatory networks and epigenetic information. The evolution of new proteins is not sufficient to produce new animal body plans, because the information required for developing new animal forms resides in complex genetic regulatory networks and even in structures outside the DNA. However, genetic regulatory networks and epigenetic information are argued to be resistant to change. The beneficial mutations observed in the present day do not affect genetic regulatory networks, and observed changes to the epigenetic information revert back in a few generations. Meyer argues that the beneficial microevolutionary changes observed cannot be extrapolated to explain macroevolution if the observed changes do not explain the generation of new genetic regulatory networks or epigenetic information.⁶⁹⁹

If these arguments about animal development are correct, then there is indeed a difference between the microevolution observed in the present day and the macroevolution required to produce new body plans. Very few responses to this line of argument have been in the discussion on ID. However, it needs to be noted that those scientists whose work the ID theorists' developmental arguments rely on do not themselves generally believe that the modern developments of evolutionary theory require abandonment of the theory. Though they agree with the ID theorists about the existence of unsolved mysteries in biology, they strongly disagree with ID about what the implications of such mysteries are. Rather, they argue that these mysteries are already in the process of being solved. One possibility is that ancient regulatory networks were not yet solidified in a way that prevents macroevolution.⁷⁰⁰

⁶⁹⁸ Meyer 2013, 315. According to Meyer, a hundred years of research in developmental biology backs up this claim.

⁶⁹⁹ Meyer (2013, 269) quotes Davidson (2006, 195): "*contrary to classical evolutionary theory, the processes that drive the small changes observed as species diverge cannot be taken as models for the evolution of the body plans of animals.*" And "*neo-Darwinian evolution -- assumes that all processes work the same way, so that evolution of enzymes or flower colors can be used as current proxies for study of the evolution of the body plan. It erroneously assumes that change in protein-coding sequence is the basic cause of change in developmental program; and it erroneously assumes that evolutionary change in body-plan morphology occurs by a continuous process. All of these assumptions are basically counterfactual. This cannot be surprising, since the neo-Darwinian synthesis from which these ideas stem was a premolecular biology concoction focused on population genetics and -- natural history, neither of which have any direct mechanistic importance for the genomic regulatory systems that drive embryonic development of the body plan.*" (Davidson 2011, 35-36) These types of quotes sound very critical of Neo-Darwinian theory, and Meyer is able to use them to great rhetorical effect. However, the force of these quotes is weakened by the fact that Davidson himself (who knows his own results best) argues that these findings should lead only to a modification of evolutionary theory and the continued scientific research of the processes behind macroevolution, not rejecting the naturalistic understanding of evolution.

⁷⁰⁰ Davidson (2011, 40), whose work Meyer builds upon, himself infers that ancient regulatory networks must have been different, and not yet solidified in a way that prevents evolution. Korthof (1998) similarly suggested in response to the earlier arguments of Denton (1998, chapter 14) that the creatures Denton uses as examples may be exceptionally resistant to evolutionary changes, and Denton's idea of interdependent functional constraints can help evolutionary biologists explain why some organisms do not change much over time. However, Korthof argues that the developmental constraints of other animals may not be as tight. Perhaps the ancestral forms of

Though ID's new arguments about the development of animal forms are significant for the movement, I will not discuss them further because the purpose of this study is not to form a scientific evaluation of ID's merits and because there has not yet been enough time for comprehensive discussion of these arguments to emerge. Analysis of the argument from irreducible complexity is sufficient to demonstrate the nature of the debate.

(4) *The pattern on the fossil record.* ID's fourth argument is based on the patterns of stasis and abrupt emergence of new animal forms. Johnson and Meyer in particular have argued that this pattern contradicts the expectations of the traditional evolutionary paradigm. Johnson and Meyer reference the work of punctuated equilibrist Gould and Eldredge. Though Gould and Eldredge believe in the existence of animal fossils demonstrating evolutionary transitions between animal forms, they also argued that the pattern of the fossil record is different from what we would expect based on classical neo-Darwinian evolutionary theory. The neo-Darwinian theory would lead us to expect to find gradually changing fossils, but the dominant patterns of the fossil record are stasis and the abrupt appearance of animals. To account for this, Gould and Eldredge devised their theory of punctuated equilibrium, which states that the development of new animal forms occurs in relatively small populations over a short period of time. In his *Darwin on Trial*, Johnson used the arguments of Gould and Eldredge to undermine belief in Darwinian evolution.⁷⁰¹

Following the publication of *Darwin on Trial*, Gould himself responded Johnson's arguments, arguing for the existence of some transitional fossils.⁷⁰² Though the experience of proponents of ID was that Johnson did well in his debate with Gould, and the arguments are repeated in ID textbooks, the arguments from fossils have nevertheless not been as central for the other proponents of ID.⁷⁰³ A recent exception is Meyer's recent book *Darwin's Doubt* (2013), roughly one third of which focuses on the argument from fossils, particularly the Cambrian explosion.

The Cambrian explosion means the geologically sudden appearance of many major animal groups (phyla) in the fossil record about 542 million years ago. Meyer argues that this sudden emergence contradicts the Darwinian thesis of gradualism. Like Johnson, he too pits defenders of punctuated equilibrium and classical neo-Darwinism against each other on the question of fossils. However, for Meyer, the Cambrian explosion is just an example of the

animals were not as constrained developmentally as modern organisms. In response to Meyer's argument, Charles R. Marshall (2013) similarly argues that the biological forms were easier to mutate in the past.

Just how tight the developmental constraints of organisms are is a topic of study in evolutionary developmental biology (see e.g. Carroll 2006), and this research is also discussed in the newer ID sources on the argument (e.g. Behe 2007, chapter 9). (Similarly Matzke 2013.) The evolutionary arguments for common descent presuppose that the basic body plans of animals do not mutate freely. Rather than changing the entire body plan of animals, evolution is forced to change existing structures slightly. This is used to explain the similarities between mammals, for example. Andrew Wagner (2007) argues that successful living organisms must have a balance between robustness and evolvability: their form must be stable enough to ensure survival in the current situation, yet evolvable enough to also survive in changing circumstances.

⁷⁰¹ Johnson 1993, chapter 4. Similarly Dembski 2002a, 344-346; Behe 2006a, 27.

⁷⁰² Gould 1992.

⁷⁰³ Woodward 2003, chapter 7.

difficulty of explaining the emergence of new proteins, genes and body plans in a Darwinian fashion. The Cambrian explosion merely accentuates the problem because the emergence of these body plans must have happened in a short time period. So, this ID argument depends on the other ID critiques of the Darwinian mechanism. However, the dependence does also run the other way. Meyer uses the fossil record to argue that even ancient creatures had highly adapted body plans, and thus their body plans were probably no more malleable than those of modern creatures. Recall that the possible greater malleability of ancient animal body plans was one possible response to the third ID argument above.⁷⁰⁴ ID's arguments are therefore meant to form a whole in which each part of the critique support others.

There are several different major critiques of the argument from the Cambrian explosion. First, (1) the Darwinian theory can be saved by postulating the existence of unfossilized creatures before the Cambrian explosion. This makes the time frame for the appearance of new biological forms much longer. Fossilization is quite rare, and perhaps it didn't occur as frequently before the Cambrian. It has long been estimated that the fossil record only contains remains from 1% or less of the species that have lived on the Earth.⁷⁰⁵ Second (2), evo-devo and other new developments in Darwinian evolutionary biology may help explain the more rapid emergence of new biological body plans in animals, so the critique is better answered by expanding evolutionary theory rather than by abandoning it.⁷⁰⁶ Third (3), the fossils in the Cambrian explosion are argued to have similarities best explained by the hypothesis of common descent. If a pattern of evolution can be discerned even in the Cambrian explosion itself, then Meyer's argument no longer appears as strong.⁷⁰⁷ Fourth (4), philosophical critiques of intelligent design can be made.⁷⁰⁸

There are other arguments in addition to these five in the ID literature. For example, Dembski has argued that there is a "law of conservation of information" which shows that no process combining randomness and selection can build new information that was not already built into the process. Dembski's point is that genetic algorithms, which attempt to simulate evolution on the computer, do not demonstrate the capability of the evolutionary process for macroevolution – unless the process of evolution was designed by an intelligence.⁷⁰⁹ But when he comes to arguing that the mechanism of Darwinian evolution doesn't actually work in nature to explain macroevolution, Dembski relies on the argument

⁷⁰⁴ Meyer 2013 and Meyer 2004a.

⁷⁰⁵ See e.g. Raup 1994, 6759-6760.

⁷⁰⁶ Related to this, Susumo Ohno (1996) argues that if the Cambrian explosion was only 6-10 million years, then the most likely explanation is that "all the animals animals involved in the Cambrian explosion were endowed with nearly the identical genome, with enormous morphological diversities displayed by multitudes of animal phyla being due to differential usages of the identical set of genes."

⁷⁰⁷ Matzke 2013.

⁷⁰⁸ E.g. Miller 2010.

⁷⁰⁹ E.g. Dembski & Marks 2009; Dembski 2002a, chapter 4. Because Dembski's argument relates to interpreting the evolutionary process as designed, I will say a bit more about this argument in chapter 8. For critique of Dembski's law of conservation of information, see Elsberry & Shallit 2003. For a discussion of whether Darwinian evolution can produce new information, see Venema 2011; for ID responses, see Luskin 2011.

from irreducible complexity.⁷¹⁰ Dembski's idea that evolution can never generate new information is also not shared by all other ID theorists. For example, Behe argues that evolution can indeed build very small quantities of new functional information, but that this nevertheless cannot explain the generation of more complex structures.⁷¹¹ So, the argument from irreducible complexity is much more central to ID than Dembski's proposed Law of Conservation of Information.⁷¹²

Most of the discussion on ID has focused on Darwinian evolution, but there is also another biological design argument which claims that design is a better explanation for the origin of life and its genetic code than any of the naturalistic alternatives. There has been much research on the origin of life (*abiogenesis*) since Darwin's speculation that life may have begun in some "warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes".⁷¹³ Many chemicals necessary for life have been synthesized in origin of life-experiments, but the experiments and the accumulation of biological knowledge have also revealed major problems in all proposed origin of life-scenarios.⁷¹⁴ The first book of the ID movement was *The Mystery of Life's Origin* (1992 [1984]) by Charles Thaxton, Walter Bradley and Roger Olsen. This shows the importance of the issue for the movement, though it was not the focus of analysis in the movement's literature again until Stephen Meyer's major work *Signature in the Cell* (2009). Meyer's focus is on the concept of biological information and the difficulty of generating it without intelligence, as seen in chapter 6.1.⁷¹⁵

The cumulativeness of the ID theorists' argument against Darwinian evolution is important to note. In chapter 6.1, I noted that for Behe, the strength of the design argument increases as the purposeful complexity of the system(s) being explained increases. Cumulativeness is also a central characteristic of their argument against naturalistic explanations of biological complexity. Thus Behe argues that the problems in the evolution of one irreducibly complex system are multiplied when we consider the interdependency of irreducibly complex systems. As an example, Behe argues that the assembly of the bacterial

⁷¹⁰ Dembski 2002a, chapter 5.

⁷¹¹ Behe 2013.

⁷¹² Another argument that ID proponents sometimes make is related to the problem of consciousness. The philosophy of mind is not really ID's home territory, and not much space is spent arguing that the emergence of consciousness, particularly human consciousness, cannot be reduced to Darwinian mechanisms. The argument is still present in ID literature, however, and may be part of the ID theorists' shared thought. The Discovery Institute's *Wedge Document* (2003), stating the goals of the movement, is very concerned about the effects of reducing human consciousness to materialistic terms. Menuge (2004b) contains much critique of materialistic understandings of human persons; Menuge's book has the endorsements of Dembski and Behe on the back cover. Behe states that Menuge "clears the fog to show that the universe contains not only matter and energy; it contains agents." See also Dembski & Wells 2007, 14-17. For an early ID-friendly discussion of the issues, see the article "Origin of the Human Language Capacity: In Whose Image" (Oller and Omdahl 1994).

⁷¹³ Darwin 1888.

⁷¹⁴ E.g. Shapiro 1986.

⁷¹⁵ Meyer 2009. For critique see e.g. Berry 2012, chapter 4 and Venema 2011. For defences of Meyer's argument see and Luskin 2011.

flagellum itself requires another irreducibly complex system.⁷¹⁶ Wiker and Witt thus term the complexity of life “intergrated complexity”. For them, life is composed of hundreds of different complex systems all working together for the good of the organism. For example, the evolution of vision also requires the evolution of the nervous system to use the new visual data, or the evolution of vision is useless.⁷¹⁷ In the same vein, Meyer and Dembski argue that the problem of the origin of life to exemplify irreducible complexity particularly well. Cells need DNA to reproduce, while the survival of DNA and its reading is dependent on the existence of cells and their systems.⁷¹⁸ So, for ID, the problem of irreducible complexity and the problem of the origin of life are linked.⁷¹⁹

There is vast discussion on ID’s anti-Darwinian arguments, and there is no need here to go through the entire discussion. To analyse the general structure, the philosophical ideas and theology of the debate, the example of irreducible complexity is sufficient. It remains ID’s most popular and most commented on argument. Thus an analysis of IC will help understand typical arguments used in the debate.

6.3. Irreducible Complexity

Questioning the Existence of Evolutionary Pathways

Behe’s argument from irreducible complexity is often construed as deductive, but it is actually a two-part argument. The deductive first part is his criticism of what he terms “direct evolutionary pathways”. However, I will argue that Behe’s criticism of “indirect evolutionary pathways” is probabilistic, not deductive. Behe admits Darwinian evolution as an in principle possible explanation for biological machinery, but argues that empirical details pose great difficulties for this Darwinian explanation. Instead, he argues that the details of biology strenghted the design inference.

I return to Dawkins’ argument from *The Blind Watchmaker* (1989), since it provides the backdrop to Behe’s argument. Dawkins argues that it is highly rational to believe in the capacities of the process of mutation and natural selection to explain even complex structures. Consider the evolution of the mammalian eye, a highly complex structure that was already used as an example of design by William Paley.⁷²⁰ Dawkins argues that

⁷¹⁶ Behe 2007a.

⁷¹⁷ Wiker & Witt 2002.

⁷¹⁸ Meyer 2009, for Dembski’s comments see Barham 2012.

⁷¹⁹ The implication is that if a system is necessary for life, then their evolution is a part of the problem of the origin of life, and thus not part of the explanatory scope of Darwinian evolutionary theory. (Barham 2012.) The naturalistic answer to this is that although these systems are necessary for the current form of life, they may not have been necessary for some unknown form of life which preceded the current one, and in which the basic functions of life such as protein systems were handled in some other way. See Griesemer 2008 for a review article of the state of origin of life research.

⁷²⁰ *Natural Theology*, chapter III.

evolution may have started with a small light-sensitive patch on the skin. When mutations improving the capability for vision appeared, they were beneficial and thus contributed to the fitness of the organism. Natural selection preserved these mutations, and accumulated them. Over a long period of time, the modern eye was evolved.⁷²¹ Dawkins presents the central assumptions of this evolutionary explanation as follows:

1. Could the human eye have arisen directly from no eye at all, in a single step?
2. Could the human eye have arisen directly from something slightly different from itself, something that we may call X?
3. Is there a continuous series of Xs connecting the modern human eye to a state with no eye at all?
4. Considering each member of the series of hypothetical Xs connecting the human eye to no eye at all, is it plausible that every one of them was made available by random mutation of its predecessor?
5. Considering each member of the series of Xs connecting the human eye to no eye at all, is it plausible that every one of them worked sufficiently well that it assisted the survival and production of the animals concerned?⁷²²

Dawkins' answer to the first question is negative: explaining the emergence of new complex organs through large random mutations is too improbable to believe. Dawkins answers the remaining four questions in the affirmative, however.

Behe regards the example of eye as misleading, because the small steps described by Dawkins are actually extremely large on the biochemical level. According to Behe, there is no such thing as a "simple" light sensitive cell. Rather, the biochemical basis of vision is highly complex, an irreducibly complex cascade of proteins.⁷²³ So, explaining the evolution of the eye in Dawkins' manner is, for Behe, akin to explaining the production of a stereo set by saying that you just first make a cassette player, then add a cd-player, then loudspeakers, then a remote controller and so on. The small leaps described by Dawkins are, for Behe, giant leaps between canyons.⁷²⁴

Behe's argument from irreducible complexity is directed against the idea that all biological structures can be explained by the accumulation of small, useful mutations. Behe's critique of Dawkins' logic is directed against the fifth point of Dawkins' argument: the plausibility that all mutations necessary for the evolution of the current form are useful. With his argument, Behe is attempting to answer Darwin's challenge, as set out in the *Origin of Species*: "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case."⁷²⁵ If some biological organ could not be developed through the

⁷²¹ Dawkins 1991. See also similar arguments in Freeman & Herron 2007, 98-99.

⁷²² Dawkins 1991, 77-81.

⁷²³ Behe 2006a, 38.

⁷²⁴ Behe 2006a, 22.

⁷²⁵ Darwin 2008 [1859], chapter VI. The basic idea remains part of the mainstream of current evolutionary theory. As Jerry Coyne (2007) puts the point: "It is indeed true that natural selection cannot build any feature in which

mechanism of natural selection and mutation, then evolutionary theory's claim to explain life's order would be jeopardized. Behe argues that "irreducibly complex" machines in cells satisfy Darwin's challenge.⁷²⁶

Behe assumes that each mutation in the evolutionary series has to be useful or at least neutral in order for natural selection to help generate new biological structures. Otherwise, natural selection will act against its preservation. The basic idea is common in explanations of evolution: As Denis Noble states, if we compare the design of an organism to an aircraft, evolution must modify and improve the aircraft without foresight while the aircraft is in flight and all systems are in use.⁷²⁷ The basic idea of Behe's argument is that this sort of useful modification and building up of new structures is very difficult or impossible in the case of irreducibly complex systems.

According to Behe, an irreducibly complex system is "*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.*"⁷²⁸ He argues that there are multiple irreducibly complex structures in cells. His basis for this is both empirical and conceptual. First, biochemical experiments can be used to test the necessity of the parts of biochemical machines. If the functioning of the system ceases when a part is removed, this part can be judged essential for the functioning of the system. Second, upon understanding how a system works, we can determine that certain parts are crucial for its operation. Behe argues that a system for swimming, for example, requires a minimum of three parts: a paddle, a motor and a part connecting the two. These parts also have to be fine-tuned to fit each other, or "well-matched" as Behe defines.⁷²⁹

In the discussion on ID, the bacterial flagellum has emerged as the most often used example of biological irreducible complexity. The flagellum, according to Behe, is an outboard motor which propels bacteria forward. Behe argues that the flagellum requires tens of parts to function.⁷³⁰ Additionally, he argues that the flagellum is part of a network of interlinked irreducibly complex machines. For example, the building mechanism of the flagellum is argued to be irreducibly complex.⁷³¹

Some problems with Behe's initial definition of irreducible complexity have emerged in the discussion. The definition of irreducible complexity assumes that all of the parts of a system are necessary for its function, but in practice no biological system is like this. For example, many parts of the bacterial flagellum are unnecessary for its functioning. Behe

intermediate steps do not confer a net benefit on the organism." Like Darwin, Coyne argues that the existence of any such feature has not been demonstrated. Note, however, that evolutionary biology does not require all features of life to be selected for by natural selection. On this see the classic paper Gould & Lewontin 1979, as well as Pigliucci & Müller (eds) 2010.

⁷²⁶ Behe 2006a, 36. See also Behe 2001b, 2003a and 2004.

⁷²⁷ Noble 2006, 109.

⁷²⁸ Behe 2006a, 39.

⁷²⁹ Behe 2006a.

⁷³⁰ E.g. Behe 2004a.

⁷³¹ Behe 2007, chapter 5.

himself recognizes this already in *Darwin's Black Box*, and admits that ciliar motors have many parts whose function is even unknown to us. However, for Behe, this does not mean that we cannot identify many other parts as crucial.⁷³² The adjustment by Behe and Dembski is that Behe's definition applies only to the irreducible core of the system – there can be additional parts which make the system more robust, and which can be removed without necessarily losing the function.⁷³³

Behe argues that irreducible complexity is a barrier to “direct evolutionary pathways”. By direct evolution, Behe means evolution which works by improving some existing function step by step, as in Dawkins' depiction of the evolution of the eye, where each modification results in a slight increase of vision. A direct evolutionary pathway means the evolution of a system from humble origins by small improvements in the system's “core function”. Irreducible complexity is, for Behe, impossible to evolve in this way, because the core function of the system emerges only after all of the necessary parts are in place. Natural selection, however, cannot select for a function that emerges only after all of the parts are in place. The system thus cannot be evolved by small beneficial steps through a direct evolutionary pathway. For example, the bacterial flagellum cannot have evolved from a simpler system for moving the bacterium.⁷³⁴ Instead, its evolution is – according to Behe – better explained by the actions of an intelligent designer, who can arrange parts to fulfil some future end.⁷³⁵

So, the idea is that the mutations leading up to an irreducibly complex system could not generate the benefit given by the whole system and thus the series leading up to the system would not fulfil Dawkins' condition number five, and natural selection does not help explain the system. Most of Behe's critics have admitted that the argument works against direct evolutionary pathways, but have still considered indirect evolutionary pathways possible.⁷³⁶ Behe's argument is that the parts of an irreducibly complex system would not have the function of the system, and so would not be selected by natural selection. However, this does not mean that they could not have had some other function, and then only later been transformed into parts of the newly formed irreducibly complex system. The evolutionary history of Behe's irreducibly complex systems, such as the bacterial flagellum,

⁷³² Behe 2006a, 39, 72-73. Miller (2002, 141) interprets Behe without noticing these. According to Miller's interpretation, Behe errs by assuming that all of the parts of the flagellum are essential for its function. But this is shown to be false by the fact that there are many different flagella with slightly different parts. However, Behe's original argument includes the admission that a motor can be built in several different ways (Behe 2006a, chapter 3).

⁷³³ Dembski 2002a, 285.

⁷³⁴ Behe 2006a, 39.

⁷³⁵ Behe 2006a, 36-39. The argument has a predecessor in Michael Denton's (1986, 90-91) argument from “integrated complexity”, which Denton traces back to biologist Jean Cuvier (1796-1832). Denton also uses the bacterial flagellum as one example of biological complexity which Darwinian evolutionary theory fails to explain (Denton 1986, 224-225). Forrest & Gross (2004) find similarities in Behe's argument to creationist Ariel Roth's argumentation (e.g. Roth 2001, 86-87).

⁷³⁶ E.g. Miller 2002, 132-136, Orr 1996.

could be very complex, with similar parts serving in many slightly different systems with different functions.

Evolutionary Co-Option as a Response to Behe

The adaptation of an existing biological structure for a new function is called evolutionary co-option. In responses to Behe, it has been illustrated with examples from the larger anatomical level. Behe focuses on biochemical phenomena, but critics have noted that his definition could just as well be applied to larger structures. It seems difficult to say that no system on the larger anatomical level requires more than one part to function. For example, paleontologist Alan Gishlick has argued that under Behe's definition of irreducible complexity, a bird's complex wing is irreducibly complex, requiring the coordinated action of nine "well-matched" parts to provide the capability of flight. However, Gishlick goes on to argue that the wing has evolved through Darwinian evolution. Based on the anatomical similarities of birds and theropod dinosaurs, paleontologists have concluded that birds evolved from flightless dinosaurs. Several intermediates have been postulated. For Gishlick, these provide evidence that the irreducible complexity of the bird's wing can be explained through an indirect evolutionary pathway.⁷³⁷ The possibility of evolutionary explanations on this level thus provides reason to also accept them as possible for biochemical irreducibly complex machines.

Behe has dismissed the use of paleontological evidence by remarking that the fossils only provide evidence of change, but not of the mechanism which affected the change. Behe accepts common descent, but not the Darwinian mechanism of selection and mutation.⁷³⁸ However, it seems that the fossil record does provide evidence for the possibility of co-option, supporting it as a possible evolutionary explanation. Behe's argument thus does not prove that Darwinian mechanisms are in principle incapable of generating irreducible complexity. Precursors to the bacterial flagellum, for example, may have had other functions. Indeed, it has been argued that even the modern bacterial flagellum doubles as a secretory system, and that the metaphor of a motor thus leads us astray.⁷³⁹ The co-option -argument has been the most popular response to Behe's argument from irreducible complexity.⁷⁴⁰ The

⁷³⁷ Gishlick 2006, 71.

⁷³⁸ Behe 2006a, 22.

⁷³⁹ Musgrave 2006.

⁷⁴⁰ E.g. Miller 2002, 151; Dawkins 2006, 143-146; Coyne 1996, 227; Kitcher 2007, 89. In addition, other scenarios for the evolution of irreducible complexity have also been proposed. Not all defenders of evolution find the co-option scenario plausible for all of Behe's systems (Orr 1996; 1997; Forrest & Gross 2004, 303-304). For Behe's comments on these other scenarios see Behe 1997a, 1997b, 2001a.

Interestingly, biologist Allen Orr argues against the co-option scenario on grounds quite similar to Behe. According to Orr, adapting biochemical parts for another function is a good general solution to the problem of irreducible complexity: "*we might think that some of the parts of an irreducibly complex system evolved step by step for some other purpose and were then recruited wholesale to a new function. But this is also unlikely. You may as well hope that*

idea of the argument is that the precursors of irreducibly complex machines had other functions, and thus natural selection preserved them. Serendipitously, the parts initially useful in other machines were also useful for the construction of current irreducibly complex machines.

The co-option scenario can be defended with further biological evidence. The most important category of evidence is homology: the similarity of the parts of irreducibly complex machines with parts of other systems. Miller argues that an important part of the bacterial flagellum is similar to the type III secretory system also found in bacteria, and Musgrave argues that homological parts are known for around 90 percent of the parts of the flagellum.⁷⁴¹ Similar homological evidence can also be found for most of Behe's other cases, strengthening the evidence for the evolution of irreducible complexity.⁷⁴² It can thus be argued that we already have at least the beginnings of plausible evolutionary histories for many of Behe's irreducibly complex systems.⁷⁴³

However, few critics have noted that Behe himself considers the co-option answer in *Darwin's Black Box*, and presents another version of his irreducible complexity -argument against it. Directly after presenting his argument against the direct evolution of irreducible complexity, Behe argues as follows:

Even if a system is irreducibly complex (and thus cannot have been evolved directly), however, one can not definitively rule out the possibility of an indirect, circuitous route. As the complexity of an interacting system increases, though, the likelihood of such an

half your car's transmission will suddenly help out in the airbag department. Such things might happen very, very rarely, but they surely do not offer a general solution to irreducible complexity." (Orr 1997)

Orr's argument against the co-option scenario is the same as Behe's: the applicability of parts with one function to a different function is too unlikely. Orr's own solution to the problem of irreducible complexity is to defend the possibility of direct evolution. Evolution might work by adding parts improving an existing function, like motion. At first, these parts simply complement the function, but over time, they may become essential to the system's function. Parts which at first interact haphazardly are formed into a seamless whole, where the removal of one part destroys the function. Thus irreducible complex systems can evolve from simpler beginnings. Behe's response is that this scenario needs detailed evidence to make it plausible. (Behe 2000b, 3-4; 2001a, 692-695.)

⁷⁴¹ Miller 2004, 85-87; see also Musgrave 2006, 81.

⁷⁴² Miller 2002, 152-161.

⁷⁴³ In *Darwin's Black Box*, Behe argued that the biological research literature does not contain any good evolutionary explanations for irreducible complexity. Behe admitted that the literature contains many examples of homology in biochemical systems, but mere similarity, for Behe, does not prove the mechanism which created this similarity (Behe 2006a, 175-176). Behe's assertion has provoked much debate. Some of Behe's critics have agreed with him about the lack of explanations (Harold 2001, 205, Coyne 1996, 227, Behe 2001a, 686). However, others have vigorously disputed Behe's assertion, arguing that the literature contains many examples of how biochemical complex systems can evolve (e.g. Miller 2002, 147-152; Forrest & Gross 2007, 304; Inlay 2007; Weber 1999). See also Venema 2012.

In the Dover trial, where Behe testified about his views on irreducible complexity, the opposing attorney was able to present Behe with a stack of peer-reviewed papers and books which were claimed to present evidence for the evolution of irreducible complexity. Based partly on this evidence, the judge concluded that Behe's argument was not good science (or actually scientific at all). However, the evidence wasn't actually reviewed or discussed in the trial. (Jones 2005, 78; Behe 2006a, 7.) Behe responds to criticisms in e.g. Behe 2000c; 2000d; 2000e; 2000f and 2000g.

indirect route drops precipitously. And as the number of unexplained, irreducibly complex biological systems increases, our confidence that Darwin's criterion of failure has been met skyrockets toward the maximum that science allows.⁷⁴⁴

Here Behe is admitting the point of his critics already in the course of stating his original argument. Irreducible complexity can in principle evolve through an indirect route, by which Behe means the co-option account. However, Behe argues that as the complexity of the system increases, the probability of such evolutionary accounts decreases to extremely low. Behe's argument against Darwinian evolution is thus probabilistic, just as his argument for design is also probabilistic. In Behe's argument, as the amount of apparently purposeful, irreducible complexity increases, so the probability of design goes up and the probability of naturalism goes down.

Niall Shanks is one of the few critics who have noted this statement from Behe. However, Shanks does not recognize any arguments from Behe to support this conclusion, and does not comment on this. Most critics of Behe's irreducible complexity have bypassed this argument, and stated the co-option account without referencing Behe's critique.⁷⁴⁵ The fragmentariness of Behe's argument may be partly to blame for the misunderstanding. Behe does not state his argument against indirect evolution concisely, but elaborates on it further only as he analyses his examples of irreducible complexity in more detail. Behe has further developed this argument in his later works. Inside the ID movement, the two-pronged nature of Behe's argument has been more widely recognized, however.⁷⁴⁶

In describing molecular motors, cilia, as irreducibly complex, Behe himself considers the possibility of co-option: "*So an evolutionary story for the cilium must envision a circuitous route, perhaps adapting parts that were originally used for other purposes.*"⁷⁴⁷ He argues this by himself referring to homology: it is clear that proteins similar to the parts of the motor are used in cells to serve other functions. Behe speculates that perhaps the building of the motor could proceed by adapting these parts first into some simple system serving an unknown function, and then add further parts until we come to the ciliar motor.⁷⁴⁸ Behe's scenario is exactly like the co-option arguments used by many of his critics.

However, Behe rejects the co-option argument based on the functional requirements of proteins for a specific machine. He argues that a protein serving in a given irreducibly complex machine has to be fitted to the other proteins required in that machine, attaching itself automatically only to those proteins, and not to any others.⁷⁴⁹ Because a machine is composed of many proteins that have to form a seamless whole, the requirements for proteins are, according to Behe, quite strict. The prior functions of the parts make them

⁷⁴⁴ Behe 2006a, 40.

⁷⁴⁵ Shanks 2004, 162.

⁷⁴⁶ E.g. Dembski 2004b.

⁷⁴⁷ Behe 2006a, 66.

⁷⁴⁸ Behe 2006a, 66.

⁷⁴⁹ Behe 2006a, 66; 2007, appendix A.

poorly fitting to serve in the new system.⁷⁵⁰ Behe concludes that “*analogous parts playing other roles in other systems cannot relieve the irreducible complexity of the new system; the focus simply shifts from ‘making’ the components to ‘modifying’ them.*”⁷⁵¹

Angus Menuge has developed Behe’s argument against indirect evolution into more systematic form. Menuge elucidates five which have to be fulfilled in order to evolve an irreducibly complex structure: (1) Availability: parts fitting to build the irreducibly complex machine have to be available in the cell. (2) Synchronization: the parts of the machine must be available at the same point in time. (3) Localization: the parts must be moved to the same part of cell, where they can be assembled into a whole. (4) Coordination. The parts have to be fitted together in the correct order. Having the right sort of parts is not enough, if they are not also assembled in a functional order. (5) Interface compatibility: The parts have to be precisely compatible and capable of acting together. Menuge sees the fulfilment of these conditions as unrealistic, just as Behe does. Behe’s responses to the co-option-argument focus on conditions four and five.⁷⁵²

Is the problem of modifying and assembling the components of irreducibly complex biochemical machines difficult for Darwinian evolution? Here Behe’s argument seems to depend on the details of how proteins work and the ID arguments about the difficulty of protein evolution. As I showed in chapter 6.2, Douglas Axe and Ann Gauger have argued that functional protein folds are extremely rare and transitions even between homologous proteins are difficult. If this is correct, then Behe’s response to the co-option argument seems strong. If Axe and Gauger are wrong and transitions between homologous proteins are easy, then Behe’s response to the co-option argument is greatly weakened. Behe himself has referenced Axe’s calculations in this way.⁷⁵³

The probabilistic version of the argument from irreducible complexity has not been interacted with in any detail by the critics. The arguments of the critics, as reported above, are that (1) homologies of the parts of “irreducibly complex” systems are just the sort of evidence one would expect on the co-option account, and (2) detailed evolutionary histories of many biochemical systems are beginning to be written, (3) evolutionary histories written on the larger anatomical level are supported with paleontological evidence. In biochemistry, finding such explanations may be more difficult due to the lack of fossils. These arguments do provide indirect evidence in support of the evolution of irreducible complexity, and they cannot be lightly dismissed. However, they also do not provide a direct answer to Behe’s argument. This misconstrual of Behe’s argument in much of the literature is unfortunate and needs to be corrected for the sake of fairness.

⁷⁵⁰ Behe 2006a, 66.

⁷⁵¹ Behe 2006a, 112-113.

⁷⁵² Menuge 2004b, 104-105. Some similar conditions are elucidated by Dembski (2004b, chapter 4).

⁷⁵³ Behe 2007, appendix A references Axe 2004; see also Behe 2007a, 248n15.

6.4. The Importance of Philosophy for the Biological Debate

The Existence of the Unexplained

Whether the evolutionary origins of Behe's examples of irreducible complexity remain a mystery or not, it seems that there are still unsolved mysteries within biology. It is not difficult to find acknowledgements of this in the discussion on Intelligent Design even from some critics of ID. For example, JohnJoe McFadden (an atheist professor of molecular genetics) explains one difficulty as follows:

The basic problem is that the complexity of biochemical pathways (unlike the eye) do not appear reducible. For instance, one of the cell's essential biochemical is AMP (adenosine monophosphate), the precursor of ATP (the energy carrying molecule), which also finds its way into DNA, RNA and many other cellular components. AMP is made from ribose-5-phosphate, but the transformation involves thirteen independent steps involving twelve different enzymes. -- Each of the twelve enzymes involved in this pathway is absolutely essential for the biosynthesis of AMP. Darwinian evolution would require this complex system to have evolved from something simpler. But, unlike the eye, we cannot find the relics of simpler works. Half or a quarter or a twelfth of the pathway does not generate any AMP or indeed anything else of value to the cell. IT appears that the entire sequence of enzymes is needed to make any AMP. But without viable stepping stones, how can an entire complex system have evolved through Darwinian natural selection?⁷⁵⁴

Here McFadden's idea is very similar to Behe's argument from irreducible complexity succinctly: it is difficult to understand how the complex molecular system required for the production of AMP could have evolved, since the parts do not appear to have any use otherwise, and since AMP seems essential for life. McFadden argues that this presents a very difficult, even unsolvable problem for current conceptions of Darwinian evolution, and motivates transitioning into a new "quantum" understanding of evolution. Cellular biologist Franklin Harold similarly argues that "*there are presently no detailed Darwinian accounts of the evolution of any biochemical or cellular system, only a variety of wishful speculations.*" However, "*we should reject, as a matter of principle, the substitution of intelligent design for the dialogue of chance and necessity.*"⁷⁵⁵

As I have argued, the literature does seem to contain at least some beginnings of accounts for biochemical evolution. However, Harold's point is still interesting. Supposing that such detailed accounts are indeed missing at least to some degree, would we still have some other reasons for rejecting ID? Harold emphasizes the importance of philosophical principles rather than detailed evolutionary explanations in rejecting intelligent design. Many defenders of evolutionary biology similarly present philosophical arguments against ID, though they also argue that there are scientific arguments for believing that the mysteries

⁷⁵⁴ McFadden 2000, 76. Quoted in Cunningham 2010, 277-278.

⁷⁵⁵ Harold 2001, 205.

of biology will be solved without ID. Previous successes in explaining complex systems like the eye should give us hope in also explaining presently unexplained complex structures. Freeman and Herron also argue that appealing to design would be tantamount to invoking miracles, and this is unallowed in science.⁷⁵⁶

Though the estimates of proponents of ID and their critics differ on the severity of unsolved problems within evolutionary biology, both agree that evolutionary biology is still an incomplete science. Whereas critics of ID see waiting for naturalistic explanations of any problems as the most reasonable course, proponents of ID argue that the progress of science has only made the problems facing naturalistic theories worse. They want exact details of how the evolutionary transitions in questions could have happened before believing in the possibility of macroevolution through naturalistic mechanisms.⁷⁵⁷

The difference of opinion in the amount of unsolved problems and mysteries in evolutionary biology is significant for the philosophical interpretation of the remaining mysteries. There is a great deal of difference between the following three options: (1) over a hundred years of scientific work has only produced evidence against the possibility of macroevolution, not for it, (2) some ideas for explaining how macroevolution happens exist, but it is still mostly a mystery, and (3) every supposed mystery brought forward by skeptics of macroevolution has been thoroughly explained. Options 1 and 3 in particular make it possible to make an inductive prediction about the future direction of research. If all research so far has tended to refute the hypothesis of macroevolution by naturalistic mechanisms, then probably future research will also tend to refute this possibility. On the other hand, if all examples of mysteries and difficulties (like the origin of life or the origin of irreducible complexity) have been throughoutly explained by naturalistic evolutionary mechanisms, then probably future problems will be solved as well. This type of inductive argument does not guarantee the conclusion, but it does seem to offer a rational reason to believe in it.

If our own opinion of the matter falls somewhere between the extremes of the first and third option and comes closer to option 2, however, then it seems that the scientific arguments by themselves are not sufficient to determine what we should think about intelligent design. Though there is difference in whether things like irreducible complexity are seen as problems, an even more central difference would then seem to be the philosophical interpretation made of the incompleteness of evolutionary theory. The questions “should we reject intelligent design, even if natural explanations are incomplete” and “what counts as evidence against Darwinism or intelligent design” are philosophical. It seems that not just scientific arguments, but also philosophical arguments are required to resist ID’s arguments.

⁷⁵⁶ Freeman & Herron 2007, 102.

⁷⁵⁷ Behe 2006a, chapters 10 & 11; Behe 2007; Axe 2012, 41-43. Critics could note that they do not require similar exact details about the nature and modus operandi of the designer before believing in intelligent design as the best explanation. ID’ers certainly seem to make more stringent demands of Darwinian explanation than of design. Perhaps this could be justified by the difference of design-based explanations from mechanistic explanations. (See chapters 3.2. and 3.3.)

Typical philosophical critiques of ID's biological design arguments are based on the varieties of methodological naturalism analysed in chapter 3.4. Some of the reasons are based on strong methodological naturalism and "in principle" arguments which aim to exclude all types of theistic or design-based explanation from science. Others are based on weak methodological naturalism and "in practice" arguments. In these types of arguments design is seen as a possible explanation of biology, which could in principle succeed in explaining biological order, but which does not in practice succeed in being a plausible explanation. For example, as seen in chapter 3.4, several evolutionary biologists argue that the design inference was completely reasonable a few centuries ago, but is only invalid today because Darwinian evolutionary biology provides a better explanation of the data.

Jerry Coyne's defence of Darwinian evolutionary biology shows the way philosophical arguments are often used in the debate. Coyne, argues that we can be sure that mechanism of selection and mutation explains complex adaptations partly because the only alternative – creationism, including intelligent design – is so bad. Coyne's arguments are that (1) ID is unscientific, because it is untestable, (2) ID is a "God of the gaps" -argument, (3) ID can explain potentially any feature of nature, and thus explains nothing, and (4) the burden of proof is not on naturalists to provide a step-by-step demonstration of how complex systems can evolve, but rather on critics who should demonstrate that the step-by-step evolution of some complex system is impossible. Coyne's case does not rest only on these philosophical arguments, because he goes on to explain empirical evidence for the evolution of complex adaptations (using the evidences from homology and the evolution of the eye, for example).⁷⁵⁸ Nevertheless, Coyne's philosophical arguments certainly seem to affect the level of certainty he has regarding natural selection as the mechanism of evolution. My point is not that it is illegitimate to use such philosophical arguments (as long as they are good arguments), but simply that their importance for the debate between ID and naturalism should be recognized.

Must Evolutionary Biology and Design be Opposed?

In chapter 6, I have focused on the debate between ID and naturalistic evolution. In this debate, design and naturalistic evolution are seen as two competing explanations of the same data. However, it is important to note that this is not the only way to understand the relationship between evolution and design. As theistic evolutionists argue, evolution and design could be compatible. Theistic evolutionist can still accept cosmic design arguments, even if there is a conflict between design and evolution as explanations on the biological level. However, I wonder if theistic evolutionists could also get some use out of ID's critique of naturalistic evolution.

⁷⁵⁸ Coyne 2009, 136-143.

Consider Behe's argument from irreducible complexity. Behe argues that it is unlikely that proteins which are specialized for one function just happen to be easily convertible to serve in another role, and that the evolution of irreducible complexity truly can proceed without multiple simultaneous mutations. For Behe, this just seems too serendipitous and incredible to be true. But suppose that such evolutionary pathways nevertheless exist. A theistic evolutionist could argue that this just goes to show how strict the conditions for evolvability are, and how much fine-tuning evolution allows. In a universe designed to allow for evolution, perhaps such serendipity could be expected, rather than being unlikely. Thus a theistic evolutionist who believes both in mainstream evolutionary theory and in the designedness of the cosmos could argue that Behe's argument simply reveals the extent of fine-tuning required by evolution, rather than refuting evolution. This is a philosophical and theological point, of course – the existence of such pathways is an empirical question. My point is merely that that this may be a possible strategy for a defender of the cosmic design argument to get some use out of Behe's argument, even if Darwinian evolution is accepted as a valid explanation for biological complexity. ID theorist Ann Gauger notes the same point when discussing the fitness landscape required for protein evolution: "*So unless someone paved a highway to Mt. Whitney that went uphill every step of the way, Darwin's engine would never get out of Death Valley. But a paved highway isn't evolution, it's design.*"⁷⁵⁹ I will come return to these ideas on the compatibility of design and Darwinism in chapter 8.

The present chapter has brought two important questions to the surface. First, how should we react to (naturalistically) unexplained mysteries in nature? Second, how should we understand the relationship between natural explanations and belief in the designedness of nature? Both of these questions are related to another common philosophical and theological critique of ID: understanding it as a "God of the gaps"-arguments. I now turn to this topic.

⁷⁵⁹ Gauger 2013. A recent study at the University of Helsinki also notes that natural selection works in some types of fitness maps, but not others. See Salazar-Ciudad & Marin-Riera 2013. The evolution of "evolvable" organisms must be possible. (Sansom 2008).

7. DESIGNER OF THE GAPS OR NATURALISM OF THE GAPS?

What should we think about naturalistically unexplained mysteries in cosmology and biology? Can there be a situation where it would be more rational to believe in the existence and actions of a creator as the true explanation, rather than believing that a naturalistic explanation exists? Or could creation and natural explanations be conceived as complementary, rather than contradictory modes of explanation?

One of the criticisms of design arguments presented in the previous chapters has been their critique as “God of the gaps”-arguments. However, there are many different understandings of what makes an argument a “God of the gaps” and why it is impermissible. The God of the gaps -critique is also often made very briefly and without considering the responses of the ID movement. This is problematic for fruitful discussion of ID’s design arguments. The purpose of this chapter is to understand both the criticism and the ID movement’s argument better.

The critique of the ID movement’s design argument as a “God of the gaps” -argument is extremely common and presented by both theistic and naturalistic critics of ID. For example, the collections *Debating Design*⁷⁶⁰, *Intelligent Design Creationism and Its Critics*⁷⁶¹, *Scientists Confront Creationism*⁷⁶², *The Panda’s Black Box*⁷⁶³, and *Why Intelligent Design Fails*⁷⁶⁴ all include several articles making this characterisation of ID’s design argument. The God of the gaps-critique is made by thinkers representing as different viewpoints as John F. Haught and Richard Dawkins. Thus Haught argues that “*ID is a ‘science stopper’ since it appeals to a God-of-the-gaps explanation at a point in inquiry when there is still plenty of room for further scientific elucidation.*”⁷⁶⁵ Richard Dawkins argues that “*admissions of ignorance and temporary mystification are vital to good science. It is therefore unfortunate, to say the least, that the main strategy of creation propagandists is the negative one of seeking out gaps in scientific knowledge and claiming to fill them with ‘intelligent design’ by default. - - It is precisely the fact that ID has no evidence of its own, but thrives like a weed in gaps left by scientific knowledge, that sits uneasily with science’s need to identify and proclaim the very same gaps as a prelude to researching them.*”⁷⁶⁶ Many more examples of this line of critique could be quoted from both naturalistic and theistic sources.⁷⁶⁷

⁷⁶⁰ Dembski & Ruse 2004, 67, 142, 238.

⁷⁶¹ Pennock 2001, 158-159, 184-185.

⁷⁶² Petto & Godfrey 2007, 309-338, 416-417.

⁷⁶³ Comfort 2007, 86.

⁷⁶⁴ Young & Edis 2006, 3-5, 24-25 178-182.

⁷⁶⁵ Haught 2004, 238.

⁷⁶⁶ Dawkins 2006, 152-153.

⁷⁶⁷ For two further prominent developments of the critique, see Cunningham 2010, 275-280 and Pennock 1999, 163-172. Even where this characterisation of ID is not present, the question of what we should think about

The critique of the “God of the gaps” has Christian origins. The first known use of the term comes from Scottish evangelist Henry Drummond (1851-1897): *“There are reverent minds who ceaselessly scan the fields of Nature and the books of Science in search of gaps – gaps which they will fill up with God. As if God lived in gaps?”*⁷⁶⁸ The phrase was subsequently adopted by many Christian theologians and natural scientists looking for a theology in harmony with the natural sciences. Dietrich Bonhoeffer famously argues in a letter written while imprisoned by the Nazis in Tengel in 1944 that *“It is wrong to use God as a stopgap for the incompleteness of our knowledge. If in fact the frontiers of knowledge are being pushed further and further back (and that is bound to be the case, then God is being pushed back with them, and is therefore continually in retreat. We are to find God in what we know, not in what we don’t know; God wants us to realize his presence, not in unsolved problems but in those that are solved.”*⁷⁶⁹ A further important figure in this development was Charles A. Coulson (1910-1974), who put the point succinctly: *‘when we come to the scientifically unknown, our correct position is not to rejoice because we have found God; it is to become better scientists.’*⁷⁷⁰ As I pointed out in chapter 3.3, the God of the gaps-critique is even made against Intelligent Design by many who defend cosmic design arguments. However, some naturalistic thinkers think the criticism applies equally to all theistic explanations: even cosmic design arguments are non-explanatory God of the gaps-arguments.⁷⁷¹ The manifold usage of the term requires clarification: what, exactly, is meant by the term, and what makes an argument a God of the gaps? And why are God of the gaps-arguments problematic?⁷⁷²

In what follows, I will analyse four main critiques of God of the gaps-arguments. First, it is argued (1) that gaps-arguments are logically fallacious arguments from ignorance, and second (2), that the past success of the natural sciences provides grounds to believe that current mysteries will ultimately be solved without reference to the supernatural. Third, (3) such arguments are thought to needlessly restrict divine activity merely to mysteries, rather than seeing God as the Creator of natural laws, and fourth (4) gaps-arguments are argued to be apologetically dangerous: if faith in God is based on the existence of gaps, then the

mysteries currently unexplained by science is still often there. Though there may be gaps in the current scientific understanding, we should search for natural explanations, rather than believe in supernatural miracles as a substitute for these explanations. For one example of this kind of rhetoric, see Susskind 2006b, 30.

⁷⁶⁸ Drummond 1894, 333. Quoted in Ganssle 2012, 130.

⁷⁶⁹ Bonhoeffer 1997, 311.

⁷⁷⁰ Coulson 1958, 16. Quoted in McGrath 2010, 202. On Coulson’s significance, see Hough 2006. Richard Bube is also an important figure in this history. Bube describes God of the gaps -arguments as follows: *“There is a long history of the attempt by Christians to prove or at least to defend their belief in the existence and activity of God by proposing that it is God alone who acts in areas in which man is ignorant of any natural mechanism. – – In this interpretation God remains the Great Mechanician, and the possibility of a complete physical, chemical or biological description - even in principle - is forever ruled out by the very existence and activity of God.”* Bube 1971, 206-207. On Bonhoeffer’s significance, also consult Bube 1971.

⁷⁷¹ E.g. Stenger 2004, 182.

⁷⁷² Plantinga (1997) and Rusbult (2004) similarly argue that the term “God of the gaps” is not useful without a precise definition of what is meant.

progress of science in closing these gaps will tend to undermine faith. The first two critiques are philosophical, and the latter critiques are theological.⁷⁷³

I begin in chapter 7.1. by analyzing the philosophical form of the criticism of God of the gaps-arguments, and the theological criticism in chapter 7.2. I argue that both forms of the criticism make important points that should be taken into account in the discussion, but that the ID movement's design argument can in principle be formulated in a way that avoids the critiques. The ID movement also makes the counter-critique that its naturalistic opponents are guilty of "naturalism of the gaps"-reasoning, where no explanation referencing a designer is allowed, even if the evidence calls for it. Rather, the ID movement argues that it is possible to discover evidence of intelligent design in nature without this being a fallacious God of the gaps-argument. In chapter 7.3, I consider thought experiments that have been made to support the in principle possibility of design arguments.

7.1. Philosophical Critiques of the God of the Gaps

The Argument from Ignorance?

As seen in chapters five and six, ID argues that we do not know any good naturalistic explanations for some important features of the cosmos and biological life. Some critics have argued that this type of argument makes ID into an argument from ignorance, which is commonly understood to be a logical fallacy: "*the mistake that is committed whenever it is argued that a proposition is true simply on the basis that it has not been proved false, or that it is false because it has not been proved true.*"⁷⁷⁴ For example, Neil Blackstone has criticized Behe's design argument as a God of the gaps -argument based on ignorance.⁷⁷⁵ The problem with Behe's argument, Blackstone argues, is that even if we do not know how something could be explained naturalistically, this does not necessarily imply that there is no natural explanation for this order. In scientific reasoning, the critique of different theories and alternative explanations is obviously important – scientific journals are full of such critiques. However, no matter how bad the prospects for finding a natural explanation for the origin of life seems, this does not in itself make supernatural design a good explanation. Rather, there have to be some sort of positive reasons for thinking that supernatural design is a good explanation for the origin of life. Like Pennock, Blackstone also argues that the progress of science is continually closing up such gaps in our understanding. Thus, in the absence of positive reasons to see something as a sign of intelligent design, we should rather wait for a

⁷⁷³ In the case of ID's design arguments, describing them as "designer of the gaps-arguments" would take ID's separation between the designer and God into account more clearly. Nevertheless, the term "God of the gaps" is commonly used by the participants of the debate and theological issues are also involved. I will use the term here with the caveat that it does not reflect the separation between the designer and God which ID's argument includes.

⁷⁷⁴ Copi & Cohen 1990, 93; quoted in Walton 1992, 381.

⁷⁷⁵ Blackstone 1997. Pennock 1999, Peterson 2010. See also Giberson 1993, Reynolds 1998.

naturalistic explanation than believe in design.⁷⁷⁶ The point of this philosophical critique of the God of the gaps is then that the ID proponents have, in the critics' estimation, failed to provide adequate positive reasons in favour of the design hypothesis. The ID movement's conclusion of design seems, to these critics, to rest too heavily on just our ignorance of naturalistic explanations.⁷⁷⁷

Earlier, while analysing the design inference as an inference to the only explanation, I quoted Sherlock Holmes' dictum: "*when you have eliminated the impossible, whatever remains, no matter how improbable, must be the truth.*"⁷⁷⁸ However, for an explanation to be even "improbable", I argued, it must be possible and somehow explain the pattern in question. No matter how implausible natural explanations are, this does not help the design argument if design is also just as implausible as an explanation. Instead, design needs to be in and of itself a possible and plausible explanation. I think one general point of these critiques is sound: we need some positive reasons in favour of design, not just arguments against naturalistic explanations. It also seems very defensible that one should generally prefer naturalistic explanations within science – this type of weak methodological naturalism even seems to be accepted by proponents of ID, as I argued in chapters 3.4 and 3.5.

Nevertheless, I wonder if characterisation of the design argument as an argument from ignorance is very helpful. It is correct that the ID movement's design argument includes a substantial amount of critique of naturalistic alternative explanations, but this is not logically improper if the argument is understood as an inference to the best explanation or an inference to the only explanation. In these modes of explanation, the critique of alternative explanations does play a large part. Furthermore, it is clear that analogies and inductive arguments based on our knowledge of intelligent design as a cause are also important for the ID movement's design arguments.

Some critics making the God of the gaps -critique of ID acknowledge that ID proponents have attempted to provide positive reasons for belief in design, not just critiques of alternative explanations. Robert Pennock, for example, argues that it is simply the bad quality of all theistic and design-based explanations of natural history that makes them equivalent to fallacious arguments from ignorance.⁷⁷⁹ As Pennock recognizes, ID proponents themselves do not believe that they are presenting a God of the gaps-argument. Rather, they explicitly deny this and argue that they are making a good positive case for design.⁷⁸⁰ As I showed in chapters 4, 5, and 6, ID proponents argue that patterns in nature provide good evidence for design. The point is made succinctly by Gonzales and Richards: "*It's not simple improbability that leads us to believe there's something fishy that needs explaining. It's the presence of a telling pattern, a pattern we have some reason to associate with intelligent agency.*"⁷⁸¹ In the ID

⁷⁷⁶ Blackstone 1997.

⁷⁷⁷ Pennock 2007.

⁷⁷⁸ Doyle 1892, "The Adventure of the Beryl Coronet", spoken by the character Sherlock Holmes.

⁷⁷⁹ Pennock 2007, 315-323.

⁷⁸⁰ Behe 2006a; Behe 2007f; Dembski 2002, Meyer 2009.

⁷⁸¹ Gonzales and Richards 2005, 303. Similarly Behe 2000a.

movement's arguments, the critique of alternative explanations is important, but the conclusion of design is not thought to follow purely from the failure of non-personal explanations.

Here the validity of the designer of the gaps -criticisms is linked to thoughts on the validity of design as an explanation. If the properties of nature the ID theorists discuss do not provide positive evidence for design, and if the postulation of a designer does not have any explanatory value in any realistic circumstance, then design cannot act as a competitor to naturalistic explanations. In this system of thought, believing in a designer is not better than ignorance. However, this is a different criticism from the criticism of design arguments as a "God of the gaps". The criticism is no longer based merely on the lack of a positive argument for design, but on the failure of these positive arguments.

Also, if belief in design has its origins at least partly in the intuitive perception of design in the universe, as seen in chapter 4.1, then this belief is not based primarily on the lack of naturalistic explanations, but on the typical operation of human cognitive faculties. Proponents of ID do defend the reliability of this intuitive belief in design by criticizing naturalistic explanations, but the ultimate origin of their belief is not in these critiques. Thus the research from the cognitive science of religion supports the contention that there is more to ID than just an argument from ignorance. Given the way our cognitive faculties work, it may be that certain features of nature are fairly automatically seen as positive evidence of design. Even if it is impossible to express this intuition as a rigorous scientific argument, this does not mean that it is therefore an argument from ignorance. In this case, "a design belief based on design discourse, rather than arguments" or "a commonsensical non-scientific argument" would be more accurate labels of the ID movement's ideas.

Clarifying the nature of "arguments from ignorance" further will help understand the crucial differences between proponents of ID and its critics better. Arguments from ignorance are commonly understood as logical fallacies. Our lack of knowledge about something does not yet prove anything, it is argued. Yet philosophers studying arguments from ignorance have questioned this simple characterisation. It seems that in the right conditions, our ignorance about something can indeed constitute evidence. Robert Larmer provides a story to illustrate the point:

If my son tells me that there is a Great Dane in the bathroom and I go look and find no evidence of a Great Dane, I conclude that it is false there is a Great Dane in our bathroom. My lack of evidence of it being the case that there is a Great Dane in our bathroom is good evidence that there is not a Great Dane in our bathroom because I have knowledge that if a Great Dane were there, there should be positive evidence to confirm its presence.⁷⁸²

It seems that sometimes we are in a position where we should be able to discover evidence of something, if it indeed existed. Our lack of evidence for the existence of a Great Dane in the

⁷⁸² Larmer 2002, 131.

bathroom, for example – in other words, our ignorance of a Great Dane – is actually good evidence that there is no Great Dane in the bathroom.⁷⁸³

It also seems that we are often able to discover the limits of natural processes, not just their capabilities. John C. Lennox makes a useful distinction between two types of gaps in natural science. First, there are “gaps of ignorance”, where our inability to explain something by reference to physical processes is merely a product of our ignorance. But there are also “gaps in principle” which are a product of what we do know, and are only deepened as we come to further understand science. Lennox gives the example of writing: no matter how much we study the physics and chemistry of paper and ink, we will not find reductionist explanation which will help us explain writing without design.⁷⁸⁴ Other examples of gaps in principle include all scientific laws such as the laws of thermodynamics and the law of gravity. Based on our knowledge of empirical reality, we can argue, for example, that apples do not have the capability to start spontaneously levitating without the action of some force other than the Earth’s gravity.⁷⁸⁵

ID’s critique of naturalistic explanations in chapters five and six assumes that we can find limits of naturalistic processes, just as the gaps-based arguments just analysed. The ID theorists do not mean to argue merely based on ignorance, but based on things that they believe we are in a position to know. It is argued that based on what we know, processes unguided by intelligence do not have the capacity to create certain types of order in the cosmos. It is also argued that as science progresses, these gaps in naturalistic explanations have only widened, and that we now have a sufficient body of research to be able to conclude something about the limits of natural processes. The crucial question in the debate is whether the ID theorists are correct in these estimates about the state of scientific research. If they are, then their argument about the limits of natural processes can be formulated as a valid argument from ignorance following the model of the “Great Dane”-argument.⁷⁸⁶ For example, Behe’s argument from irreducible complexity (chapter 6.3) could be formulated as follows:

- (1) If there were a naturalistic non-design based explanation for irreducible complexity, we would probably know it.
- (2) But we do not know any such naturalistic explanation for irreducible complexity.
- (3) Therefore, there is probably no such naturalistic explanation for irreducible complexity.

Now we just need to add a few premises to infer that an intelligent designer was involved.

⁷⁸³ See Ganssle 2012 for further analysis of Larmer’s example and exact formulations of its logic. Walton (1996) provides a thorough analysis of arguments from ignorance in various fields of science.

⁷⁸⁴ Lennox 2007, 188-192.

⁷⁸⁵ Ratzsch 2001, Snoke 2001.

⁷⁸⁶ As Larmer (2002, 131) puts the point: “we can ask whether those who appeal to gaps in our scientific understanding as evidence of supernatural intervention in the course of nature do so solely or simply on the basis of ignorance of how natural causes operate or rather on the basis of presumed positive knowledge of how natural causes operate.”

- (4) Irreducible complexity is created by either an unguided naturalistic process or by intelligent design.
- (5) Therefore, irreducible complexity was probably created by intelligent design.

This argument implicitly assumes that intelligent design is at least a plausible explanation for the features in question. As Gregory Ganssle notes, our background assumptions strongly affect our evaluation of these types of God of the gaps -arguments.⁷⁸⁷ How improbable does a naturalistic explanation have to be in order for divine design to be a more probable explanation? Do we have independent reasons to support belief in divine action as an explanation at this point, and does the context of the event fit with this explanation? Does the event fit into a divine plan that we can understand? For a committed naturalist the very idea of a supernatural designer may be so doubtful that even the extreme improbability of natural explanations after hundreds of years of research may not be sufficient to make this kind of argument credible.⁷⁸⁸ Someone who regards design-based explanations as explanatorily empty could also argue that the above gaps-argument is unconvincing: if design is no better as an explanation than random chance, then there is no benefit to exploring design-based explanations.⁷⁸⁹ On these understandings the divine designer will remain the more improbable explanation, the non-explanatory God of the gaps, even if naturalistic explanations currently seem astronomically improbable. For someone beginning with the belief that there exists a God who wanted to create life, the explanation may not be as incredible.⁷⁹⁰ Different theologies of divine action will also lead to different expectations about gaps, as I will argue in more detail in chapter 7.2.

It seems to me that ID's critics do not need to question the in principle possibility of arguing that natural processes have limits. It also doesn't need to be argued that ID's argument here is a logical fallacy. It seems that even arguments from ignorance can in principle be quite valid. Rather, the crucial question is whether we have enough knowledge to conclude that the present existence of mysteries in cosmology and biology gives enough reason to conclude that at least some of these mysteries will remain unsolved naturalistically. This is what proponents of ID and their naturalistic critics disagree on.

The ID theorists' critique of methodological naturalism is relevant to the God of the gaps-theme. In addition to the fallacy of the God of the gaps, the ID theorists argue that there is also the fallacy of the "naturalism of the gaps". Their critics are confident that natural explanations for all currently unexplained natural phenomena will be found. But it seems to

⁷⁸⁷ Ganssle 2012.

⁷⁸⁸ As seen in chapter 3.1, ID theorists would protest that the designer of the design argument does not have to be supernatural. However, as also seen in that chapter, there are also reasons against the hypothesis of alien designers, and the ID theorists themselves do not regard it as a satisfying hypothesis about the identity of the designer. Like the ID theorists, the naturalists could also think that invoking alien designers merely pushes the problem of the origin of biological complexity back one step: how did alien life evolve, then? If it can be explained by a naturalistic process of evolution, then why invoke design in the case of planet Earth?

⁷⁸⁹ This is actually the central reason Pennock (2007) regards ID's design arguments as God of the gaps-arguments.

⁷⁹⁰ Ganssle 2002, 135-138.

be in principle possible that real “gaps” in the capabilities of natural processes exist, and the true explanation for some features of nature cannot be found unless we are open to this possibility. “Naturalism of the gaps” is argued to assume, before empirical investigation, that nature is a self-contained system and that the true explanation for every phenomenon is naturalistic.⁷⁹¹ To phrase the ID theorists’ view of naturalism in terms of the above quote from Arthur Conan Doyle: if alternatives to naturalism are impossible, then even improbable and otherwise implausible natural explanations can be accepted as true.⁷⁹² As in the case of methodological naturalism, I think the critique of the God of the gaps must also be formulated in a way that evades this criticism. I will now turn to one possible way of doing just that.

Arguments Based on the Success of Science

Another way to argue that some argument is a God of the gaps is to argue on the basis of history that a given scientific mystery is likely to be eventually explained naturalistically. Pennock, for example, argues that design has historically been used as an explanation for natural order when some phenomenon is mysterious and unexplained by naturalism. But this sort of design inference has been, argues Pennock, always historically falsified with the progress of science, which provides better naturalistic explanations for the phenomena. So design inferences have historically been based on ignorance and have been discarded when knowledge has increased. This past history should lead us to be cautious about making arguments based on present scientific mysteries.⁷⁹³

In contrast to Pennock, Ratzsch argues that *“the ‘erosion of gaps’ argument is both factually and philosophically weaker than usually acknowledged. Gaps have certainly evaporated in some cases under pressure of scientific advance, but I don’t know of anyone who has actually done the work of constructing a historical induction for the usually assumed constant drumbeat of collapsing empirical gaps. The case is complicated by e.g. Kuhn’s contention that sometimes in scientific revolutions ground is lost and previously closed gaps suddenly re-open. (Of course, from a design perspective, even one genuine gap would be of logical interest.) And intriguingly enough, at least one gap – cosmic fine-tuning – seems to be gaping ever wider the more fully it is investigated. The platform for this induction is missing a couple legs.”*⁷⁹⁴ So, there is disagreement about the history of science: has

⁷⁹¹ E.g. Dembski 2003b. ID critic Bradley Monton (2013, 46) similarly argues that strong methodological naturalism actually assumes metaphysical naturalism: *“Given the commitment to methodological naturalism, the success of science hinges of the contingent fact that naturalism is true.”* This is a strong statement –theological views where God is not expected to act with miracles outside the web of natural causes in a scientifically discoverable way also fit with strong methodological naturalism.

⁷⁹² As seen in chapters 3.4. and 3.5. the ID theorists thus argue that methodological naturalism includes an unfair a priori prejudice against the possibility of design. No matter how strong the evidence of design, a methodological naturalist could never see it while being faithful to his basic assumptions.

⁷⁹³ Pennock 1999, 198.

⁷⁹⁴ Ratzsch 2006.

the progress of research tended to favour naturalism, or have the mysteries only gotten deeper with the advancement of science?

A further way to criticize an argument for limits is to argue that those limits have not yet been established by the scientific research. In chapter six, I showed saw that there is disagreement about how well evolutionary mechanisms for the evolution of biological information and biological complexity are known. Even when all parties agree that we cannot yet fully explain the naturalistic origin of life or its basic molecular machinery, they disagree on whether this allows us to make the sceptical conclusion about the prospects of future naturalistic research. Jerry Coyne, for example, argues that *“biologists are beginning to provide plausible scenarios for how ‘irreducibly complex’ biochemical pathways might have evolved. As expected, these systems involve using bits co-opted from other pathways originally having different functions. – – In view of our progress in understanding biochemical evolution, it is simply irrational to say that because we do not completely understand how biochemical pathways evolved, we should give up trying and invoke the intelligent designer. If the history of science shows us anything, it is that we get nowhere by labeling our ignorance ‘God.’”*⁷⁹⁵ According to Daniel Dennett, the present lack of knowledge about the details of biological evolution is caused by the lack of incentive for researchers to work on mapping out the evolutionary pathways: *“The young researchers who have the training to do it prefer to tackle other topics.”* According to Dennett, this is because showing that these routes exist will not get them any fame; they will merely be proving what all of their colleagues already believe. They don’t want to waste their professional career on merely confirming a theory they already believe to be well-evidenced.⁷⁹⁶ So, the validity of a given gaps-argument will depend on what we think about the state of the research.

All of these critiques are ways of questioning the credibility of the premises of the gaps-argument, rather than the fundamental logic of the argument. So, the basic point that science can also give us knowledge about the limits of natural processes seems to be one that both parties of the debate could in principle agree on. Gaps-arguments don’t need to be called fallacious before one can question one or more of their premises.⁷⁹⁷ One can also recognize that it is in principle possible to imagine empirical evidence that would count strongly against any naturalistic explanation of the origin of life, for example. Ratzsch argues that if we had already done ten thousand years of research on naturalistic origin of life-hypotheses and the problems seemed similar to those afflicting the creation of perpetual motion machines, we would certainly be in a position to argue that these results tell us something about the inability of natural processes to produce life.⁷⁹⁸ The reasoning here doesn’t seem fallacious. Our ability to gain knowledge about the limits of natural processes

⁷⁹⁵ Coyne 2005, part V.

⁷⁹⁶ Dennett & Plantinga 2011, 33-34.

⁷⁹⁷ Thus several critics of Behe’s argument from irreducible complexity have also recognized that Behe is not attempting to argue out of ignorance, but based on the known structural properties of biological organisms. See Kitcher 2001, 262 & Depew 2003, 441. This is also Behe’s own understanding of the argument (e.g. Behe 2000b). ID’s biological arguments were presented and analysed in more detail in chapter 6.

⁷⁹⁸ Ratzsch 2001, 142.

does not mean that we actually have knowledge of the limits of evolutionary processes. This is a question for scientific study. Nevertheless, the in principle possibility of gaps-arguments (given that the research comes to the conclusion that natural processes are limited at some point) is a philosophically interesting conclusion.⁷⁹⁹ Again, I am converging on the same conclusion as when I analysed strong and weak methodological naturalism and the logic of design arguments: design arguments can in principle be possible, and whether they succeed or not depends on our background assumptions the validity and credibility of these types of explanations, and the state of the evidence.

Are Cosmic Design Arguments also Gaps-Arguments?

Some regard both cosmic design arguments and biological design arguments as gaps-arguments. For critics like Victor J. Stenger, cosmic design arguments are just as vacuous and just as likely to be overturned by the progress of natural science as biological design arguments.⁸⁰⁰ Only if some phenomenon were to be “*not only currently scientifically inexplicable but can be shown to forever defy natural description*” would Stenger be prepared to allow theistic explanations.⁸⁰¹ Ratzsch concurs with the assessment that cosmic design arguments also presuppose a gap in naturalistic explanations, but argues that there is no reason to believe that this gap will ever be closed by natural science. Design arguments based on gaps can be reasonable, even if they are fallible.⁸⁰² Others see only biological design arguments as gaps-arguments. Thus cosmic design arguments are seen as plausible even by many who simultaneously criticize the ID movement’s biological design arguments as a gaps-argument.⁸⁰³

The issue is further complicated by the concept of the “limit question”, which Ian G. Barbour defines as “*ontological questions raised by the scientific enterprise as a whole but not answered by the methods of science.*”⁸⁰⁴ In the theology and science community, it is often argued that science itself can indeed find its limits and raise questions which it itself cannot answer. For example, science can study the laws of nature, but the explanation of the fundamental laws of nature is a matter of metaphysics, not the natural sciences. The ethical

⁷⁹⁹ I am agreeing here with Allan Harvey’s (2000) assessment: “*If we truly want to find out ‘what happened,’ we should not exclude any possible explanation a priori, be it God or invisible unicorns. Some explanations may be more plausible or more amenable to scientific testing, but I see no good reason why theistic explanations of the GOG-1 type should automatically be dismissed without consideration of the evidence. One can question whether invoking the supernatural can actually be considered science, but just because something is not science doesn’t mean it is an invalid means of gaining understanding.*”

⁸⁰⁰ Stenger 2004, 182. See also Susskind 2006b, 30.

⁸⁰¹ Stenger 2004, 13-14.

⁸⁰² Ratzsch 2006.

⁸⁰³ For one example, see Miller 2002, chapter 8.

⁸⁰⁴ Barbour 1997, 90.

questions raised by science and the question "why is there something rather than nothing?" are also considered to be outside the capacity of science to answer.

However, what differentiates limit questions (which are legitimate) from God of the gaps-arguments (which are thought to be illegitimate)? Both of them concern issues where at least the proponent of the argument thinks that science has reached its proper limit, and the area of theology begins. The central differentiating factor seems to be that the label "limit question" is used of arguments which we think are good, whereas the label "God of the gaps" is used of arguments which we think are bad. If we should reject one of these arguments and not the other, it is not so much because of it falls into a class of "gaps"-arguments, but because we find the premises less than credible. It is just that sometimes it really is credible to argue that science has reached its limits, and at other times it is not. So, in the theology and science community, the question of cosmic fine-tuning is typically regarded as a limit question, where explaining the fine-tuning by reference to God is thought to be relevant possibility. However, in the case of biological design, explanations that reference design are thought to be examples of God of the gaps-arguments, because these are in competition with Darwinian evolutionary biology.

Nevertheless, it seems to me that this type of distinction between cosmic and biological design arguments cannot be made a priori, but only on the basis of what the evidence seems to support as the true limits of the natural sciences. Based on the doctrines of the freedom of God and *creatio ex nihilo*, we cannot know what the world is like without empirical investigation. There is a possible world where the origin of life happens through a natural chemical process, whether deterministic or indeterministic. Most scientists believe that we live in this kind of world. In this possible world, the origin of life is clearly not a limit question, but can be studied and explained exhaustively on the level of the natural sciences. But there is also a logically possible world where the origin of life cannot happen by any naturalistic process, but can only happen as a divine miracle, an event going beyond what nature could produce on its own. In this world the origin of life is indeed a limit question, since it can never be explained by naturalistic processes. In this world, what we here call a biological God of the gaps-argument would actually be true. It seems that God could have created either one of these worlds, and so we must do empirical research in order to find out what kind of world we live in.

So, are cosmic design arguments also gaps-arguments? It seems to me that both sides have a point. Stenger and Ratzsch are correct that both types of arguments attempt to refer to features of nature that are difficult or even impossible to explain naturalistically. As seen in chapter five, defenders of cosmic design arguments also spend much time arguing that proposed alternative explanations for fine-tuning (such as the multiverse hypothesis) are not actually better explanations of the evidence. Both biological and cosmic design arguments refer to positive evidence for design, not just the lack of naturalistic explanations. The arguments have much in common in their logical structure. It therefore would be strange to criticize biological design arguments as logically invalid while accepting the logic of cosmic design arguments.

However, those opposing the God of the gaps-designation in the case of cosmic design arguments seem to be correct that the phenomena described in cosmic design arguments are

more difficult to explain naturalistically than the biological phenomena. It may be that the explanation of natural laws has traditionally been outside the purview of natural science and part of metaphysics for good reason. Scientists like Stenger do not wish to acknowledge any limits to the possibilities of natural science. However, it seems at least currently plausible to argue that there are some questions here that natural science does not seem equipped to ever resolve. The question of why something exists rather than nothing certainly seems like a good candidate for a “gap” that will never have a naturalistic explanation as a matter of logic.⁸⁰⁵ Using the strategy of level-shifting, it can be argued that finding a naturalistic explanation for cosmic fine-tuning and rationality is also in principle impossible. In contrast, biological design arguments are often formulated in competition with fairly broadly accepted scientific theories. Even though it is possible that the generation of irreducibly complex systems is also impossible for naturalistic processes, it also seems possible to imagine a world where naturalistic evolutionary routes for developing such systems indeed exist

Both cosmic and biological design arguments therefore include gaps where no naturalistic explanations are thought to exist. However, for cosmic design arguments it is easier to argue that the gaps are such that no naturalistic explanations will ever be found. Because their logical structure is similar, both can in a way be characterized as gaps-arguments. To avoid hiding this similarity, but to nevertheless understand the differences between the two, I submit that it would be helpful to think of the difference between cosmic and biological design arguments as one of degrees rather than kind. The difference is about just how difficult it is to explain (or even imagine explaining) some phenomena naturalistically, and so about how credible the premises of the gaps-argument. Even though the logic of the arguments is similar, the existence of gaps could thus well be more credible in the case of cosmology.⁸⁰⁶ It could also be that the cosmic level of explanation is where theistic explanations are more at home theologically. These reasons may well be more pressing for theists – perhaps theists do not reject God of the gaps-explanations for philosophical reasons, but for theological ones.⁸⁰⁷ I will now turn to consider this possibility.

7.2. Theological Critiques of the God of the Gaps

Above, I referenced two theological critiques of God of the gaps –arguments: (1) Such arguments are thought to needlessly restrict divine activity merely to mysteries, rather than seeing God as the Creator of natural laws, and (2) gaps-arguments are argued to be

⁸⁰⁵ See Hart 2013, chapter 3; Turner 2004, chapter 11 and 12.

⁸⁰⁶ It seems in principle possible to imagine a situation where the gap would be just as credible in the case of biology. For example, consider Ratzsch's example referenced in the main text, where we had ten thousand years of naturalistic origin of life-research, with insuperable problems. It seems that something like this would indeed increase the credibility of biological gaps-arguments.

⁸⁰⁷ Collins 2012, 224.

apologetically dangerous: if faith in God is based on the existence of gaps, then the progress of science in closing these gaps will tend to undermine faith. I will now analyse these theological issues in more detail.

Models of Divine Action

Does God act in nature, and if so, how? Robert J. Russell suggests that the major problem with locating God's activity primarily in interventions into the natural order rather than in the natural processes themselves is that this "*suggests that God is normally absent from the web of natural processes, acting only in the gaps that God causes.*"⁸⁰⁸ The problem of a God of the gaps-theology is, then, that it does not recognize God as the Creator of natural laws and processes. In the traditional Christian understanding, God can act through secondary causes, not just directly. God's activity is not restricted merely to the miraculous events. Rather, God is understood to also work through natural laws and mechanisms and to sustain their existence continually. So, gaps-arguments arguably create an unnecessary conflict between natural explanation and belief in divine activity.⁸⁰⁹

Russell's warning is an important reminder of the breadth of divine activity. However, it is questionable whether anyone in the Intelligent Design debate believes that God's activity is restricted purely to miracles. It is possible to distinguish between three broad ideas about divine action in nature. The first (1) argues that God acts only through miracles, not at all through natural laws. This view comes close to occasionalism, which holds that all events happen by the will of God, and nature does not have any causal powers of its own.⁸¹⁰ The second view (2) argues that God acts both through natural laws and through miracles (understood as acts of God which supersede what nature normally does).⁸¹¹ This view suggests that God acts both in the web of natural processes in its gaps. The third view (3) is that God acts only through natural laws and processes.⁸¹²

As Craig Rusbult has noted, views that restrict God's activity merely to miracles are extremely rare or non-existent.⁸¹³ Instead, theists have traditionally believed in something like the second view.⁸¹⁴ Proponents of Intelligent Design clearly also identify with the second view, not the first view. They thus do not restrict divine activity just in the gaps unfilled by

⁸⁰⁸ Russell 2006, 584.

⁸⁰⁹ McGrath 2009b, chapter 8. See McGrew 2013 for a good discussion on different concepts of miracles and Carroll 2010 for a discussion of different understandings of "natural laws".

⁸¹⁰ Larmer 2014, chapter 1.

⁸¹¹ Both Plantinga (2011) and Robert Larmer (2014) have criticized understanding miracles as violations of natural laws, preferring to understand them as special divine action that is religiously significant and which differs substantially from what regular natural processes would have caused on their own.

⁸¹² Rusbult (2004) provides a more complete description of the possibilities with seven different types of gap-theologies. Here I have used Jaakko Sorri's (2013) simpler threefold division, since it is sufficient for my analysis.

⁸¹³ Rusbult 2004.

⁸¹⁴ The biblical tradition also includes both aspects of divine activity. (See Gustafson 1994).

natural processes. As I showed in chapter five, the ID movement affirms the designedness of the natural order as a whole and believes that the laws of nature are designed. Dembski follows the traditional doctrine of creation in arguing that *“not only has God created the world, but also God upholds the world moment by moment.”*⁸¹⁵ However, as I argued in chapter 6, the ID movement also wants to find evidence of the intelligent designer’s activity in natural history beyond the natural laws.⁸¹⁶ Proponents of ID want an account of natural history where reference to the purposive actions of an intelligent designer is a central part of the explanation for biological complexity, and natural, undirected processes are clearly insufficient for explaining all of biology.⁸¹⁷ The ID theorists do emphasize that their account of the intelligent designer does not require that the designer work through miracles understood as violations of natural law. It could be that the designer works through a directed natural process or by influencing quantum events, for example.⁸¹⁸ However, they are also not willing to dismiss the possibility of miracles and gaps in nature. Thus Dembski argues that it is in principle possible to argue that there are real gaps in nature: *“A full and efficient use of our empirical and theoretical resources for discovery should be made before we accept a proscriptive generalization. But once this has been done, to suppose that all the gaps in extraordinary explanations must be fillable by natural causes cannot be justified.”*⁸¹⁹

There is a conflict between different models of divine action here. What sort of world and what sort of God we believe in will influence our ideas about the plausibility of gaps in nature and the plausibility of miracles. If we accept a model of divine action which precludes miracles, then any God of the gaps-argument will indeed be theologically problematic. In the discussion on Intelligent Design, such models have been proposed prominently by Michael Ruse and Howard Van Till. Ruse’s argument is based on the problem of natural evil, which I will look at in more detail in chapter 9. Briefly, Ruse argues that if we believe in a God who acts in nature through miracles and supervises the details of biology, then it becomes inexplicable why this God does not act more to prevent evil. It is better, Ruse argues, to reject all gaps and miracles. This even includes Jesus’ resurrection: Ruse argues that it is much

⁸¹⁵ Dembski 1998c, 14.

⁸¹⁶ Dembski 1998c, 14-15.

⁸¹⁷ Johnson 1995; 2001.

⁸¹⁸ See e.g. Behe 2007, chapter 10; Dembski 2002a, 333-337. This leaves open questions. Why do the ID theorists reject Darwinian evolution as incompatible with design, but believe that some other type of natural process could be employed by the designer? I will come back to these questions in chapter 8. Dembski’s proposal that God works through quantum events is likely influenced by the work of Robert J. Russell, who argues that God can act in the world non-interventionistically through influencing quantum events. For more on Russell’s work, see Russell 2008, chapters 4-6. However, Russell is not pleased with Dembski’s use of his concepts.

⁸¹⁹ Dembski 1999a, 245. Michael J. Murray (2003, 9-12) has argued that there is a tension in ID’s argument at this point. Since Dembski’s method of inferring design in practice works by eliminating natural explanations, doesn’t this mean that any design detected by Dembski’s method must be interventionist? There is a point to Murray’s criticism – sometimes the ID theorists do seem to oppose natural explanations and design needlessly, as I will argue further in chapter 8. However, the criticism is not necessarily fatal for Dembski’s position. Dembski’s category “design” can also include natural processes that are directed by intelligence; he is seeking to eliminate merely those naturalistic explanations that are argued to work without design at any level.

better to understand it simply as a change in the disciples' mental states than as a real physical miracle.⁸²⁰

Van Till's argument has a quite different basis, beginning from God's goodness, rather than natural evil. According to Van Till, it is a great good for the universe to possess the capacity to self-organize itself. Since God wants to create a maximal amount of good, his goodness would lead him to gift creation with the ability to self-organize itself, and thus work through naturalistic evolution in creation. According to Van Till, biological design arguments suppose a cosmos that God has to continually interact and tinker with, which is contrary to his picture of what a good God would do.⁸²¹

There are many different models of divine action, and it is clearly possible to formulate an understanding that makes all appeals to divine interventions in history theologically dangerous.⁸²² However, given that the mainstream of the Christian theological tradition has held that God can be found both in beauty of nature's order and in his miraculous activity within history, it is difficult to argue that the ID movement's acceptance of divine activity both in secondary causes and through miracles is theologically heterodox.⁸²³ There are many different understanding of divine action, and it seems quite possible to construct an understanding of the world where God's interaction with his creation is expected. As Robin Collins argues, it could be that God is the sort of a Creator who likes to meddle in what he has created.⁸²⁴ Collins himself defends a theology of divine action where God works through Darwinian evolution, but his motivation for this defence comes from the empirical evidence for Darwinian evolution. This seems a much better founded position than basing one's acceptance of Darwinian evolution on contested theological arguments.

ID proponent Dembski has argued that Van Till's theological critique of gaps-arguments rests on the picture of the world as a vast machine, akin to a watch. A

⁸²⁰ Ruse 2003, chapter 15 & 2001, chapter 6. Though Ruse argues that it is most coherent for Christians to also reject Jesus' resurrection as an example of a real physical miracle within history, one could in principle modify his position to be more compatible with traditional Christian doctrine. One could argue that miraculous divine action is a more credible possibility at theologically important points, such as in the events of salvation history. However, a proponent of ID could then well argue that some events in natural history (such as the origin of life and the origin of humanity) are also important theologically, and thus miraculous activity could also be expected at these points. Ganssle (2012, 138) makes a similar point.

⁸²¹ See e.g. Van Till 2000 & 2001.

⁸²² Recent decades have seen much interest in the theme of divine action. There is a broad variety of opinions: Nicolas Saunders (2002) argues that all theories of providential, miraculous divine action are inadequate, and that this leads to a crisis of traditional Christian theology. However, the mainstream of scholars within the "divine action project" agree that a coherent concept of divine providential action can be formulated. Wildman 2004, 31-32. Plantinga (2011, chapters 3-4) similarly argues that there is no contradiction between belief in miracles and modern science. According to Plantinga, all arguments for a contradiction actually depend on non-scientific philosophical presuppositions. Plantinga also rejects the concept of a miracle as a violation of the laws of nature as unworkable. Halvorson (2012) and Silva (2014) criticize and develop the argument further. Savuoja (2007) is a fine survey of recent analytic discussion of miracles.

⁸²³ Ross McCullough (2013) makes this point forcefully: *"There is no natural explanation for the Resurrection: The explanation is that God did it. Here is a gap and a God we all already believe in. The inevitable theological conclusion is that there can be nothing wrong with a God of the gaps, so long as it is not a God made to fit the gaps."*

⁸²⁴ Collins 2009, 242-243.

watchmaker who constantly has to repair his product is not a good watchmaker. Good watches require no intervention to keep functioning. Assuming that God is the greatest conceivable watchmaker, we can expect God to have created the world with all the resources needed to function (and produce the various forms of life) without intervention. However, Dembski asks us to imagine the world not as analogous to a watch, but to a musical instrument. Unlike watches, musical instruments are made to be interacted with, and there is nothing strange about playing a piano one has made. On this picture of the world, it is quite plausible that God would interact with the world.⁸²⁵

So, it does seem to be in principle possible to construct a model of divine action that allows for ID. The metaphor of the world as a musical instrument has good precedent in the Church Fathers. As backup for his theological argument, Dembski is able to point to Gregory Nazianzus. Gregory compared the universe to a lute and claimed that God's glory is manifest in nature, just as the skill of the luteplayer is visible in the lute: "*For everyone who sees a beautifully made lute, and considers the skill with which it has been fitted together and arranged, or who hears its melody, would think of none but the lutemaker, or the luteplayer, and would recur to him in mind, though he might not know him by sight.*"⁸²⁶ Michael Murray has similarly argued that it possible to construct, from within the Christian tradition, a conception of God where God's love leads God to interact not just with humanity, but also with nature in a way that transcends natural laws. God's action within human salvation history is the more important for classical Christianity, since human persons are thought to have special significance for God. Nevertheless, natural history is also traditionally believed to be valuable in itself and as a necessary prelude for human history, so it is not impossible that God's miraculous activity could extend outside human salvation history.⁸²⁷ However, it is important to note that this type of model also does not require God to act miraculously in natural history: interaction with natural history through secondary causes or through scientifically invisible quantum events would be just as real interaction as miraculous activity.

Apologetic Concerns

The second theological concern with God of the gaps-arguments is apologetic: if belief in God is primarily based on gaps in nature, then the progress of science in filling these gaps will tend to undermine belief in God.⁸²⁸ Based on some examples from the history of science, many argue that it is better to argue for God based on phenomena which are not expected to

⁸²⁵ Dembski 2002a, 328.

⁸²⁶ Dembski, Downs & Frederick (2008) is a collection of the writings of the Church fathers on creation and design. Nazianzus' comments are found in his Oration XXVIII.

⁸²⁷ Murray 2006. This essay somewhat softens Murray's earlier theological and philosophical critique of the ID movement (Murray 2003).

⁸²⁸ Brooke 2010, 78-79.

ever be open to scientific study.⁸²⁹ As John Haught argues, theological accounts of nature are typically understood to concern the ultimate character of reality, rather than operating on the level of scientific theories.⁸³⁰ The traditional question “why is there something rather than nothing”, for example, does not seem liable to be ever answered by natural science. Thus natural theology based on this question does not seem as liable to be falsified with the progress of science as gaps-arguments⁸³¹

I have argued that a theological model compatible with the existence of gaps in natural history can be formulated; otherwise the existence of gaps would be a good argument for atheism. The point of the apologetic concern is different, however. Even if God’s interventions into natural history are a possibility that our theology of nature allows, it may still be a good idea to be careful about making such claims about divine action. Since the main focus of theology is outside God of the gaps-arguments, at least faith should not be thought to depend on gaps-arguments. As Allan Harvey has noted, there is a temptation “*to forget God’s work in routine things and only acknowledge his hand in obvious miracles.*”⁸³² The theological critique of the God of the gaps can guard against this temptation. I will argue in chapter eight that ID sometimes comes close to making the rationality of belief in God depend on the existence of gaps in nature, and so this warning is important for ID.

However, the necessity of gaps for belief in God does not seem to be an inevitable conclusion of the ID position. Suppose that one believes that there are broad grounds for belief in God, that evolutionary theory is fully compatible with Christian belief, and that Christian faith therefore does not depend on gaps in natural history. These theological and philosophical beliefs do not seem to determine scientific beliefs about evolution in any necessary way. It seems logically possible for someone who accepts these theological ideas to believe that there actually are empirically discoverable gaps in the abilities of natural processes, and that there is evidence of miraculous divine activity within natural history. Believing that some scientific theory is theologically unproblematic does not mean that I have grounds for believing that this scientific theory is true. Thus one can believe that the phlogiston theory of burning is compatible with Christian belief without believing that it is true. It seems conceivable that someone could also believe that Darwinian evolution is compatible with Christian belief, but not true.

⁸²⁹ As Ratzsch (2010) points out, there does not currently seem to be any study showing that religious believers have typically argued for God based on phenomena that have later been explained scientifically. The examples typically invoked are thunder as the wrath of the gods, the explanation of the order of the solar system as a result of Laplacian naturalistic processes and Darwinian evolutionary biology. But it is questionable whether these few examples show the prevalence of God of the gaps-thinking, or the general shrinking of gaps. Hart (2013) points out that classical theologians have typically argued for God based on features of the world (such as the existence of anything at all, the rationality and beauty of the cosmos and the features of consciousness) that science still seems incapable of explaining.

⁸³⁰ Haught 2008, 35.

⁸³¹ Turner 2004, chapters 11 and 12.

⁸³² Harvey 2000.

Many Christians also believe that miracles of healing continue to happen in the modern day and provide additional evidence for the existence of the Christian God, but this does not mean that their Christian faith depends on the authenticity of every individual miracle story. Similarly, someone could believe that God has acted miraculously in natural history, and construct a gaps-argument to provide evidence of this, without their faith depending on this argument. This type of gaps-argument is not as worrying from an apologetic standpoint, since it does not make the truth of the entire Christian faith depend on the success of a particular apologetic argument.

According to theologian Ross McCullough, once the critique of the gaps-arguments is understood as apologetically motivated, it becomes possible to introduce countervailing apologetic concerns.⁸³³ McCullough argues that gaps-arguments could be helpful *“without being taken as either necessary or sufficient for belief. At present, as in the past, such arguments can serve as breaches in the dam of atheism without being meant to clear the river on their own, or then to baptize you in the stream.”*⁸³⁴ For example, if real miracles have happened in human or natural history, then this would be very difficult for naturalism, but good confirming evidence for theism. It could be argued that strong methodological naturalism is also dangerous for theistic faith apologetically, or that accepting it would concede more ground to metaphysical naturalists than is necessary. Current gaps in the naturalistic explanations for the origin of life, the origin of consciousness or the origin of fine-tuning could at least be used to argue for the necessity of humility in constructing a full naturalistic narrative of the cosmos. Openness to signs of the activity of God beyond the laws of nature is at least part of traditional Christianity in the case of human history.⁸³⁵ McCullough’s argument is that perhaps an openness to such activity in natural history could also help create openness in the case of human history.⁸³⁶

Here different views about the significance of miracles are important. For someone who believes that miracles are powerful signs of the existence and moral attributes of God, it could be that gaps requiring miracles in the history of life would provide especially clear evidence that God is indeed theistic and not just deistic, and that God indeed values the existence of life. As I will argue in chapter 8, the ID theorists indeed believe that it would be religiously valuable to have evidence of God’s interaction with the world beyond the laws of nature. For others, divine action within human history may well be enough, and it is clear

⁸³³ McCullough 2013.

⁸³⁴ McCullough 2013.

⁸³⁵ Larmer (2014, chapter 2) provides an interesting quotation from Aquinas supporting this possibility: *“the divine power at times works apart from the order assigned by God to nature, without prejudice to His providence. In fact, He does this sometimes in order to manifest His power. For by no other means can it better be made manifest that all nature is subject to the divine will, than by the fact that He sometimes works independently of the order of nature; for this shows that the order of things proceeded from Him, not through natural necessity, but through his free will.”* *Summa Contra Gentiles*, Book 3, chapter 99. As others have noted, Aquinas also emphasized the functional integrity of the creation, but perhaps miracles do not need to be thought as contrary to this, if they are not seen as violations of natural laws. (Feser 2008, Hart 2013).

⁸³⁶ Some thinkers argue the other way around: because there was no divine intervention in evolutionary history, it is not credible to believe in divine intervention within salvation history, either. (E.g. Ruse 2000, 96-98).

that this is the more important thing for Christianity.⁸³⁷ The concept of divine action in natural history also raises the problem of theodicy: if God intervened even to create something as minuscule as the bacterial flagellum, why did he also not intervene to stop the evolution of diseases and parasites? I will come back to this question in chapter 9.

Are these countervailing apologetic concerns pressing enough to make gaps-arguments attractive? It seems to me that this should depend on our assessment of the evidence as described in chapter 7.1: Does it look like the progress of science is steadily providing naturalistic solutions to these puzzles, or are they just getting deeper with the progress of science? Does it seem like we are in a position to make an informed assessment that there really is a “gap” at this point in nature, and not just a gap in our knowledge? If so, then seems possible to argue, following McCullough, that there are some apologetic payoffs to such a gaps-argument, as long as one can also avoid the dangers of the gaps-argument. If we admit the possibility of God’s interventions into natural history even while emphasizing theology’s role as an ultimate explanation, we can critically examine the cases for both the sufficiency of naturalistic theories of origins and intelligent design. Theists can follow the evidence in deciding whether and what sort of “gaps” there are in nature. An openness to miracles and the adoption of weak methodological naturalism does not require supporting ID. Thus theistic evolutionist Keith Ward can also argue *“if there is a God, a Creator of the universe, it is plainly possible that God might perform miracles, might bring about events that no created cause has the power of itself to bring about.”*⁸³⁸ Based on Ward’s example, acceptance of the possibility does not logically require accepting that it has actually happened in a given case. It simply requires openness to the arguments.

It seems to me that the Christian tradition can in principle live with many different models of divine action, and go with either Paley, Darwin or a combination of both. If one comes to believe, based on the empirical evidence, that natural processes indeed have limits and God has intervened in natural history, then the Christian tradition certainly has the resources to deal with this. If this were not true then the discovery of gaps in nature’s capabilities to produce life would actually provide an argument against the existence of the Christian God. But I will argue that this conclusion is far too ambitious, despite the problem of evil. Rather, the discovery or non-discovery of gaps would merely provide arguments against some models of divine action.⁸³⁹ As theistic evolutionist Denis Lamoureux remarks: *“God can intervene into ‘gaps’ or ‘discontinuities’ in nature to introduce new species or add/modify body parts or genes of already existing species. After all, He is God! But the question is whether the Lord actually intervened this way in origins.”*⁸⁴⁰ The critique of the “God of the gaps” still has a

⁸³⁷ For one recent discussion on the religious significance of miracles, see Larmer 2014, chapter 2.

⁸³⁸ Ward 2003, 742.

⁸³⁹ I am not aware of any fully developed argument to show that the existence of miracles in natural history would indeed be evidence against God. Some arguments based on the problem of natural evil come the closest to this. (See chapter 9.3) Hart (2013, 36-41) and Cunningham (2010, 275-288) do argue that gaps in the abilities of evolutionary processes would actually count against theism, but do not present a developed argument to this effect. In chapter 8, I will agree with some of the other criticisms Hart and Cunningham make against ID.

⁸⁴⁰ Lamoureux 2013, 177.

use, however, since it can be used to stress the compatibility of belief in evolution and creation and to warn against frivolous theistic hypotheses and models which restrict God's activity merely to mysteries which are currently unexplained by natural science.

For some naturalistic thinkers theistic explanations always seem to be either fallacious arguments from ignorance (as in the case of biological gaps-arguments) or unnecessary explanations that are cut by Occam's Razor (as in the case of cosmic fine-tuning). On this understanding, one can reject a priori both theistic natural theology which operates on a different explanatory level than natural science, and ID's attempt to construct design-based explanations on the level of science. I have argued that both types of arguments can in principle be interesting and it is possible for them to be explanatory. I will now continue to analyse some further arguments for the point that our criteria of good explanations should not be such that they rule out theistic, design-based explanations for these phenomena a priori.

7.3. Thought Experiments and the Naturalism of the Gaps

The Importance of Thought Experiments for the Debate on ID

Testability has traditionally been considered an important criterion of scientific theories. In situations where two different scientific theories compete as explanations for the same data, scientists will attempt to find an additional empirical test that will enable us to finally see which theory is better. In the discussion on Intelligent Design, it is clear that the conflict is not just between different understandings of the empirical data, but also between different philosophies. Thought experiments are one of the traditional ways of bringing out the implications and testing the intuitions behind different philosophical ideas. They are the "laboratory of the mind" for deciding between competing ideas.⁸⁴¹ In the debate on design arguments, thought experiments have often been used to defend the possibility of evidence for design against common critiques and examine how detection of non-human design could be possible. For example, the thought experiments arguably show that it is in principle possible to have strong evidence of design even if the designer's motives are previously unknown.

In this chapter, I will analyse this seldom-discussed, but important side of the ID discussion. Thought experiments are important not just for ID's design arguments, but also for the design arguments of broader natural theology. I will begin by introducing the idea of thought experiments. I will then consider two Pre-Darwinian thought experiments (from Paley and Hume) before moving on to the ID movement's thought experiments and possible avenues for critique.

⁸⁴¹ Brown & Fehige 2011.

Thought experiments are vehicles to explore our concepts and their relations by supposing some counterfactual situation. There are many types of thought experiments and precise classification is difficult.⁸⁴² Thought experiments are usually thought to be essential to philosophy, but they have even played a surprising role in natural science. For example, Galileo Galilei (1564-1642) used a thought experiment to argue that Aristotelian physics is contradictory⁸⁴³, and modern physicists also use thought experiments in discovering the implications of theories.⁸⁴⁴ Famous thought experiments include the “brain in a vat”, arguing the possibility that our perceptions are just illusions, “monkeys and typewriters”, arguing that chance can generate order given infinite resources, and Searle’s “Chinese room”, designed to show that computers do not think or understand. The examples listed are all controversial, and this goes to show that a thought experiment seldom ends the debate. A philosopher who wants to dispute the conclusion of the thought experiment can argue that the experiment is built on false or improbable assumptions and thus leads to an erroneous result. However, thought experiments are nevertheless useful tests of our thinking. Whereas scientific experiments provide a way to test our theories against the reality of nature, thought experiments test the logical coherence and intuitive plausibility of our ideas.⁸⁴⁵

The significance of thought experiments is disputed. This is particularly in thought experiments which are used to argue for strong metaphysical conclusions, as is often done in the philosophy of mind. For example, it is often argued that since we are able to conceive of the existence of our minds without our bodies, this is evidence that our bodiless existence is actually possible. This assumes a connection between conceivability and possibility, and has sometimes been disputed.⁸⁴⁶ But the thought experiments in the discussion on ID are not built on this controversial assumption, so I think they should be much more universally acceptable. These thought experiments are not aimed at providing evidence for the existence of a designer, but at testing our intuitions about different models of design-based explanations.

In response to this use for thought experiments, it could be argued that intuitions are generally unreliable, and thus thought experiments that test our intuitions do not yet tell us

⁸⁴² For example, Karl Popper (1959) distinguished three types of thought experiments: (1) heuristic, meant to illustrate a theory, (2) critical (against a theory), and (3) apologetic (in favour of a theory). But this doesn't yet tell us very much about how thought experiments work, just what the purpose of presenting them is. For different analyses of thought experiments, see Wilkes 1988, Sorensen 1992 and Häggvist 1996; for general reviews of the discussion see Brown & Fehige 2011 and Roux 2011. The discussion on Intelligent Design would benefit from a thorough analysis of all thought experiments used in the debate, what sort of conclusions are drawn and how they are used to support different models of design detection. In this chapter I will limit my discussion mostly to thought experiments in opposition to “naturalism of the gaps” and in favour of the in principle possibility of evidence for design.

⁸⁴³ Palmerino 2012.

⁸⁴⁴ See e.g. Hossenfelder 2013, 11-22.

⁸⁴⁵ Brown & Fehige 2011.

⁸⁴⁶ See Gendler & Hawthorne 2002 and Taliaferro 1994 for different perspectives on this. I personally think that since our personal experience is the way we gain information about minds in the first place, our intuitions about what minds are like should count as at least some evidence about the matter. However, this may not be enough to override all other arguments in the philosophy of mind.

much. However, I would argue that our intuitions about explanations continue to be important even in science. As philosopher Petri Ylikoski argues, “science has its origin in common sense cognition. There should be some kind of continuity. Of course, it now includes much that is apparently incompatible with common sense, but I seriously doubt that this incompatibility also extends to the general principles of explanatoriness.”⁸⁴⁷ If our common-sense intuitions can tell us anything, then they should be able to tell us about philosophical principles of explanation. Actually, if our intuitions cannot tell us about principles of explanation, then it is difficult to see how we could gain this knowledge.⁸⁴⁸ If our intuitions are wrong in the cases of the thought experiments, it would at least be desirable to be able to explain why and how they are wrong.⁸⁴⁹

Two Classic Thought Experiments on Design

Thought experiments are not just important in the contemporary debate on Intelligent Design, but also historically. I will consider just two examples here: Cleanthes’ “voice from heaven” in Hume’s *Dialogues Concerning Natural Religion* (1779) and William Paley’s famous “watch on a heath” in his *Natural Theology* (1802). These thought experiments have the same purpose as the modern ones I will consider: they aim to defend the in principle possibility of evidence for design and also a certain account of what constitutes such evidence.

Cleanthes’ thought experiment in the *Dialogues* is made in response to several criticisms of natural theology by the sceptical philosopher Philo. First, for Philo, repeated observation is the only reliable way to demonstrate the connection of cause and effect. Because we have not observed the generation of several universes, we cannot make general claims about what is required to make one. Secondly, Philo argues that there is a profound dissimilarity between human works of art and the cosmos, rendering analogical design arguments unsound.⁸⁵⁰ With his thought experiment, Cleanthes wants to demonstrate the flaws of Philo’s criticism:

Suppose, therefore, that an articulate voice were heard in the clouds, much louder and more melodious than any which human art could ever reach; suppose that this voice were extended in the same instant over all nations and spoke to each nation in its own language and dialect; suppose that that the words delivered not only contain a just sense

⁸⁴⁷ Ylikoski 2001, 51. Ylikoski is not commenting on thought experiments here, but his comments are applicable to the matter. Similarly Hällsten (2007, 25) argues that a theory of explanation must give justice to our intuitions about explanations.

⁸⁴⁸ Ratzsch (2009) argues that science would be impossible without the reliability of at least some human intuitions and some correspondence between human rationality and the structure of the cosmos. For a good general discussion on the definition of intuitions and their importance see Pust 2012. I am using his definition of rational intuitions: briefly, they are “mental states in which a proposition seems true”.

⁸⁴⁹ See also Dougherty 2014, chapter 4 for a defense of taking the reliability of our common sense beliefs as a starting point.

⁸⁵⁰ *Dialogues*, part II.

and meaning, but convey some instruction altogether worthy of a benevolent Being superior to mankind – could you possibly hesitate a moment concerning the cause of this voice, and must you not instantly ascribe it to some design or purpose? Yet I cannot see but all the same objections (if they merit that appellation) which lie against the system of theism may also be produced against this inference.⁸⁵¹

The problem, according to Cleanthes, is that Philo's objections could also make it difficult to consider such a voice from heaven designed. For example, we could argue that we have no example of any previous event like this, and therefore an inductive design inference won't work. We would need to observe several such voices caused by divine beings before being able to make the inference. It might be responded that we know the cause of the voice by analogy with human voices. However, an analogical inference could be criticized because of the dissimilarities between human voices and the divine voice. No human voice could be so powerful, and no human so virtuous and wise. The vocal chords required to produce such a voice would be difficult to imagine, and so on. Cleanthes argues that such objections are intuitively absurd, and this reveals the emptiness of Philo's skepticism: "*You see clearly your own objections in these cavils; and I hope too, you see clearly that they cannot possibly have more force in one case than in the other.*"⁸⁵²

Cleanthes' thought experiment is an attempt to test the cogency of Philo's sceptical arguments by applying them to a new case. It is a *reductio ad absurdum* where Cleanthes is trying to show the falsity of Philo's premises by extending them to their logical (but intuitively absurd) conclusion. His argument is that either Philo's sceptical arguments also work against the evidence in the thought experiment, or they do not work at all. So Philo should either reject the intuitive conclusion of design in the case of the voice of heaven, or also accept it in the biological world. For Cleanthes, the design argument works both in the case of the voice and of the cosmos.

Enter Paley's example of a watch on a heath. I have already quoted the example previously in chapter 4.2, but will do so again to help in the analysis:

In crossing a heath, suppose I pitched my foot against a *stone* and were asked how the stone came to be there, I might possibly answer that for anything I knew to the contrary it had lain there forever; nor would it, perhaps, be very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be inquired how the watch happened to be in that place. I should hardly think of the answer which I had before given, that for anything I knew the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? Why is it not as admissible in the second case as in the first? For this reason, and for no other, namely, that when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose – –. Every indication of contrivance, every manifestation of design, which existed in the watch,

⁸⁵¹ *Dialogues*, part III.

⁸⁵² *Dialogues*, part III.

exists in the works of nature; with the difference, on the side of nature, of being greater and more, and that in a degree which exceeds all computation.⁸⁵³

This is the part of Paley's example that is usually quoted, and here it is not clear that it is clearly a counterfactual thought experiment like the voice from heaven. It seems like finding a watch on a heath is an event that all participants of the debate believe to be possible, and so the thought experiment is only weakly counterfactual. However, Paley's further analysis of the example moves it further from our actual situation in the direction of counterfactuality. Paley first presents eight different notes of the example in the first chapter and then makes one larger modification of the example in the second chapter. Through these subtle modifications of the example, Paley indirectly answers the criticisms of the design argument made by Hume and others, arguing that inferring life to be designed is possible. Paley believes that the thought experiment of the watch shows the criticisms of the design argument to be weak, even irrational.

I will briefly go through Paley's nine points to show what the nature of his thought experiment is. First (1), Paley argues that it wouldn't weaken the conclusion of design if the person observing the watch had never seen one made or known anyone capable of making one. Thus background knowledge of and previous experience of the designer's capabilities is not necessary for the design inference. This is an indirect response to Hume's argument that only inductively gathered experience of the creation of life forms would make the design argument possible. Second, (2) Paley argues that small errors in the operation of the watch would not invalidate the conclusion of design. This is in response to the problem of natural evil. Third (3), the mysterious nature of some of the parts of the watch would not also not weaken the conclusion of design. Fourth (4), nobody would be satisfied by the objection that the order of the watch does not need to be explained because it is just one possible configuration of matter, and some configuration had to exist. Fifth (5), a vague reference to some unknown naturalistic "principle of order" would not be a better explanation than design. Sixth (6), seeing the purposeful order of the watch as something that exists merely as an illusion in the eye of the beholder would also be an unsatisfactory answer. Seventh (7), a vague argument that the watch is produced by laws of nature would be unsatisfactory because laws do not themselves create anything under Paley's definition. Eighth (8), the observer's small amount of knowledge related to the whole universe should not make it difficult to conclude that the watch is designed based on what he does know. Ninth (9), the conclusion of design would be only strengthened, if the watch possesses the capacity to reproduce itself. It would lead to a different understanding of the designer and the process of design, but not change the conclusion. This final modification of the example finally brings the case of the watch identical to the case of biological order, and thus Paley is in a position to make his design argument.⁸⁵⁴

⁸⁵³ *Natural Theology*, chapter 1.

⁸⁵⁴ *Natural Theology*, chapters I-II.

As can be seen from these points, the thought experiment of the watch on a heath is crucial for Paley's response to the typical criticisms of design arguments in his day. The nine points consider nine different grounds for objecting to the biological design argument and reject all of them by pointing out that these responses would be absurd in the case of the watch. The first of Paley's points is already relevant for the modern discussion on Intelligent Design. As we saw in chapter 4.3, many modern critics of the design argument argue (following Hume) that background knowledge of the designer's existence, abilities and intentions is necessary for the design argument. Paley's thought experiment is aimed at just this sort of criticism. He argues that in the case of the watch, we can form the conclusion of design just by observing the order of the watch, using our general knowledge of how designers generally operate. So we do not need to know beforehand that a designer capable of producing precisely this type of object exists.

Both thought experiments are used as responses to criticisms of design arguments in the same way. My own understanding of the logic of this response is as follows:

7. Assumption X says that we cannot have evidence of design unless condition Y.
8. In hypothetical situation Z, we have evidence of design, even though condition Y is not fulfilled.
9. Therefore, assumption X is faulty.

The examples presented here are somewhat different, however. Cleanthes' thought experiments are clearly fanciful, while Paley's thought experiment starts out quite close to our practical reality. Its initial closeness to our actual situation gives Paley's thought experiment some rhetorical force – the critic finds it difficult to deny that we can see the designedness of watches, since in our actual experience we do find that they are designed. However, this also makes it more difficult to evaluate how our intuitions in the example are formed. Would we indeed have the intuition that watches are designed, if we did not have previous experience of them?⁸⁵⁵

A critic of Paley could thus argue that it is difficult to get beyond our knowledge that watches are designed to get a good sense of our intuitions regarding what we would think if we did not already possess this background knowledge and merely discovered watches whose order was a natural consequence of the operation of natural laws. One response to this objection is provided by the more fanciful sort of thought experiments outlined by Cleanthes. In these cases, we are dealing with something that is merely highly analogous to the products of human design, yet the conclusion of design seems intuitively quite clear. If the intuitions seem to be very similar as in Paley's more realistic case, then it seems that the degree of fancifulness in the thought experiment is not greatly responsible for the way our intuitions operate in these cases.

As noted, despite presenting such thought experiments, the *Dialogues* remains overall critical of natural theology. I will return to *Dialogues*-inspired lines of response to thought

⁸⁵⁵ Similarly McGrath 2011, 110.

experiments at the end of this chapter, but first I will turn to consider the ID movement's thought experiments. Like their predecessors from the time of the English Enlightenment, the ID movement presents both fanciful and realistic thought experiments.

Some of Intelligent Design's Thought Experiments

In both Hume's and Paley's texts, thought experiments occur early on in the argument, underscoring their importance for their argument. The ID movement's literature also includes many thought experiments used as answers to important criticisms of the design argument, but these are not typically presented at the beginning of ID's argument. One exception is provided by William Dembski's "On the very possibility of the design argument".⁸⁵⁶ The essay is one of the first essays of the earliest collection of ID articles, *The Creation Hypothesis*.⁸⁵⁷ The point of the essay is to defend the possibility of ID's project of seeking evidence for intelligent design in nature, and Dembski's thought experiment of "the Incredible Talking Pulsar" is the central argument used. Dembski aims to show that the detection of supernatural design is in principle possible, and thus the exclusion of design from consideration of possible explanations is not rational. The example is broadly as follows. Suppose that a pulsar star some billions of light years away emits regular radiomagnetic signals, which are found to be a message in Morse code. As the worldwide scientific community studies the signal, the pulsar identifies itself as "*the mouthpiece of Yahweh, the God of both Old and New Testaments, the Creator of the universe, the final Judge of humankind.*" To confirm this claim, the pulsar agrees to answer any questions we might put to it. Soon, through the messages, medical doctors learn how to cure AIDS, archaeologists find lost civilizations, physicists find their unifying theory of the forces of nature, and mathematicians obtain proofs for problems which are impossible to solve without infinite computational resources. Dembski argues that this would be clear evidence of divine design.⁸⁵⁸

Dembski acknowledges the outlandishness of his example, arguing that no theologian would expect God to reveal himself in this way. Thus the example is for Dembski a mere logical possibility, not something that would realistically happen. However, for him the example demonstrates that "*design has at least the possibility of becoming perfectly evident.*"⁸⁵⁹ This then opens up the possibility of considering whether we have at least some evidence of

⁸⁵⁶ Dembski 1994.

⁸⁵⁷ Moreland (ed.) 1994.

⁸⁵⁸ Dembski 1994, 113-138. Interestingly, Dembski explicitly rejects Cleanthes' "voice from heaven" -example. According to Dembski, a skeptic faced with such a voice would be more likely to think that he had become insane than to believe in God. Dembski's critique of the example does not take into account the intersubjective element in Cleanthes' example: the voice was heard simultaneously by all people of all nations. This would make it difficult for the skeptic to use this strategy. The skeptic would have to claim that all people had simultaneously become insane for this "insanity defence" to work – a quite incredible proposition.

⁸⁵⁹ Dembski 1994, 129.

design in our universe. Dembski goes on to argue that design can also be the best explanation for some pattern of nature even the evidence is not quite as strong as in his example. For him, the thought experiment opens up the further three questions: “Q1. Have any events that would constrain us to postulate design actually occurred, and if so, what are they? Q2. How subtle can the evidence for design be and still constrain us to postulate design? In particular, what methods of inquiry would enable us reliably to detect these more subtle instances of design? Q3. Why isn’t the evidence for design as obvious as it might be?”⁸⁶⁰

In this early text, the thought experiment is presented as the main argument for the possibility of detecting intelligent design. In his later texts, Dembski has used many different strategies for defending design arguments. For example, his book *No Free Lunch* (2002) Dembski begins with the importance of design-based explanations for practical life, and only later uses more fanciful, science-fiction based examples to show how we could in principle also detect the existence of non-human intelligence.⁸⁶¹ Similarly, Behe’s discussion of design detection in his *Darwin’s Black Box* (1996) begins with thought experiments describing very ordinary events such as scrabble games and trap construction. Only after does Behe reference more fanciful examples of design detection taken from science fiction in order to show that the detection of non-human design is also in principle possible.⁸⁶²

Dembski, Behe and Meyer have all referenced the Search for Extraterrestrial Intelligence -project (SETI) as an example of how the methods of intelligent design are already used in science. Here their central example is SETI pioneer Carl Sagan’s science fiction book *Contact* (1985, also as a movie in 1997). In *Contact*, a signal from space is found to contain a long series of prime numbers. When scientists investigate the signal deeper, they discover the blueprints for a vast machine. The signal is understood to be a message from an alien civilization. The Intelligent Design theorists argue that this conclusion would indeed be the only reasonable one, and it would be foolish to insist that we search for a materialistic, nonpersonal explanation for the message. Again, this is thought to show how nonhuman design can in principle be detected, and insistence on naturalistic explanations can in some cases be foolish. The ID theorists go on to argue that just the same type of order is also found in nature, for example in the genetic information of organisms, and that this provides evidence that life is intelligently designed: the existence of its features can only be explained if we suppose the operation of a mind.⁸⁶³

As noted, some of the thought experiments used by ID proponents are not as fanciful. For example, Behe uses a thought experiment about a shipwreck onto an apparently uninhabited island while discussing the effect of background beliefs on the assessment of

⁸⁶⁰ Dembski 1994, 130.

⁸⁶¹ Dembski 2002a, 1, 6-8. However, Dembski does continue to use his “Incredible Talking Pulsar” as an example in his later book *The End of Christianity* (2009, 91-92).

⁸⁶² Behe 2006a, 192-196; 196-199.

⁸⁶³ Dembski 1998c, 17; Dembski 2002a, 6-8; Behe 2006a, 196; Behe 2000b, 7 & Meyer 2004. The ID link to SETI is also prominently expressed in the ID friendly Illustra Media films *Unlocking the Mystery of Life* (2003) and *The Privileged Planet*. (2005)

evidence for design. According to Behe, theistic beliefs do make it easier to see evidence of intelligent design in nature, but it is in principle possible even without theistic presuppositions. To illustrate his point, Behe asks us to suppose we are the survivors of a shipwreck, crashed on an apparently uninhabited island. Suppose that we find stones arranged in a circle on the beach. If we have reason to believe that there may be someone else on the island, we might see this circle as a product of intelligent design. Supposing that we are convinced there is nobody else there, we would conclude that the arrangement of stones is just a strange coincidence. But the evidence could be stronger up to a point where we would be convinced of design almost regardless of our initial presuppositions. For example, if the stones were arranged to form the words "WELCOME, SURVIVOR", we would be certain of design. Behe argues that the order of nature might also contain very strong evidence of intelligent design, which can be seen to have evidential value even without religious presuppositions. However, both atheism and theism do effect the evaluation of the strength of the design inference: an atheist, giving a low prior probability to the hypothesis of design, will require more evidence for the conclusion of design than the theist, for whom even supernatural intervention into nature can be a possibility.⁸⁶⁴

These thought experiments are all very similar to those presented by Paley and Cleanthes. It is argued that in the situations of the thought experiments, we have clear evidence of the existence of a nonhuman intelligence, even though some critique presented against ID could also be presented against these examples. For example, if only designers whose existence, motives and capacities were known beforehand could function as explanations, then design would not be a good explanation in these cases.⁸⁶⁵ However, since design nevertheless seems to be explanatory in these cases, then the conditions posited in the critiques cannot be absolute. The thought experiments are used to argue that while it is helpful to have information about the designer beforehand, a more detailed conception of the designer can also be formed after the initial design inference.

Other Modern Thought Experiments

I stated previously that thought experiments in defence of design arguments have also been used by philosophers outside the ID movement. For example, John Leslie's influential defence of cosmic design arguments in his book *Universes* (1985) includes references to thought experiments in practically every chapter.

The purpose of Leslie's thought experiments is to test the force of objections to his argument. For example, it has been argued that we cannot have evidence of design, because (1) this is the only universe we have observed, (2) it is unreasonable to seek for an explanation for the properties of the laws of nature, since the laws are themselves the

⁸⁶⁴ Behe 2001a, 105.

⁸⁶⁵ In chapter 4 I examined examples of such arguments against ID.

fundamental reality, and (3) there is nothing mysterious about the fact that natural laws allow for life, because otherwise we couldn't be here. Responding to these arguments, Leslie formulates his thought experiment: *"the question-begging would be obvious were electron microscopes to reveal that particles regularly formed long chains which spelled out 'GOD CREATED THE UNIVERSE', this then being shown to result inevitably from basic physics"*.⁸⁶⁶ If it is valid to claim that we cannot have evidence of divine design because this is the only universe, then surely the pattern "GOD CREATED THE UNIVERSE" as a result of natural laws also would be evidence of design. Likewise, if seeking to explain the basic laws of nature is unreasonable, then wouldn't it be unreasonable even if the basic laws created a pattern like this? Furthermore, of course we could not observe the pattern if it did not exist, but this does not yet provide an explanation for the pattern. Leslie argues that the order of the cosmos we observe is also reasonable to explain by reference to the action of a deity, even if the evidence for divine design is not as obvious as in the example.⁸⁶⁷

Lydia McGrew likewise argues that it is unreasonable to expect a theory about the exact motivations and psychology of a non-human designer before being able to make a design inference. Rather, the similarity of some order with products of human design should be enough to infer design. Suppose that we found a massive Volkswagen-like car orbiting a distant planet. McGrew argues that the analogical design inference would be possible, even if we did not have previous experience about these designers and found it difficult to fathom why anyone would build a giant Volkswagen and place it like this. We would be able to infer the existence of a designer with properties necessary for the production of the Volkswagen, namely intelligence and ability to build car-like objects. McGrew argues that this undercuts many objections to biological design arguments. For McGrew, independent knowledge of the designer's specific attributes are not needed. Rather, our knowledge of the general capabilities of designers is sufficient for realizing that explanation here requires the sort of capabilities which designers have.⁸⁶⁸

Del Ratzsch's analysis of the logic of design arguments in his *Nature, Design and Science* (2001) utilizes many thought experiments for many purposes. Ratzsch does not merely respond to criticisms of design arguments through his thought experiments. Rather, his whole model of how design is detected is built largely by using practical examples and thought experiments.⁸⁶⁹ One of Ratzsch's thought experiments must be mentioned here simply because it is one also mentioned in a critique of thought experiments. Ratzsch argues that *"should we find an alien bulldozer on Mars, it will be perfectly safe to say that without alien design and activity that object simply would not have been there. Design is thus explanatorily implicated not only in some of the specific characteristics of a designed entity, but sometimes in its*

⁸⁶⁶ Leslie 1985, 109.

⁸⁶⁷ Leslie 1985, 109.

⁸⁶⁸ McGrew 2004, 13.

⁸⁶⁹ Ratzsch 2001. Similarly, Mullen (2004) builds his argument on design detection based on "paradigm cases" which any model of design detection should be able to explain. Mullen's cases are not just thought experiments, but include historical examples.

*very existence.*⁸⁷⁰ With this thought experiment, Ratzsch is arguing against those who think that design as an explanation is always illegitimate. Rather, design can be also be an extremely well-supported explanation. Specific characteristics of the designed object like its purposeful complexity can also be unnecessary for the conclusion of design – sometimes simply the extreme difference of an object from what natural processes normally create can be sufficient proof of design. Ratzsch's thought experiment has also received the approval of Dembski, who has used it to argue that design can indeed be detected even if the motivations of the designer remain unknown.⁸⁷¹

Some Critical Responses

To deny the conclusions of these thought experiments, the critic needs to argue that the assumptions or the logic of these thought experiments are faulty. I will illustrate a few ways to respond by criticizing one of the ID movement's thought experiments which is somewhat easier to criticize and then move on to analyse how these types of criticisms could be made against the thought experiments analysed above.

Arguing that we do not need independent evidence of the designer in order to make a design inference, Dembski provides a thought experiment about space travellers who claim to have designed life. As evidence for their claim, the aliens show us technology that can demonstrably assemble even the most complex organisms, as well as evidence that they have visited the Earth previously. There is no "smoking gun" and no "made in Alpha Centauri" markings can be found in biological life. The evidence is indirect, since the alien's technology was too advanced to leave any trace of their activity on Earth. In this situation, it seems to Dembski that design would clearly become the better explanation of life's evolution even for naturalistic thinkers. But this raises a worry for Dembski: *"If design is a better explanation simply because we have independent knowledge of technologically advanced space aliens, why should it not be a better explanation absent such evidence? If conventional evolutionary theory is so poor an explanation that it would cave the instant space aliens capable of generating living forms in all their complexity could be independently attested, then why should it cease to be a poor explanation absent those space aliens? The point to appreciate is that specified complexity can demonstrate this poverty of explanation even now — apart from space aliens and bizarre thought experiments."*⁸⁷²

Dembski's example is unconvincing for two reasons. First, Dembski and ID's naturalistic critics have a different understanding of how strong the evidence for evolution is. If Dembski's critics maintain that they would not see design as a better explanation even in the case of this thought experiment, then the thought experiment has no force to convince them. Second, the thought experiment seems to again undervalue the importance of

⁸⁷⁰ Ratzsch 2001, 21.

⁸⁷¹ Dembski 2002c.

⁸⁷² Dembski 2005b, 30.

independent evidence and background knowledge supporting the conclusion. As seen in chapter 4, the prior probabilities we estimate for different explanations do have consequences for our evaluation of what the best explanation is.

This weakness of Dembski's thought experiment can perhaps be made clearer by a comparable thought experiment of my own. Suppose that there emerges a large group of people claiming to be wizards responsible for controlling weather. They claim that naturalistic explanations for meteorological phenomena are mistaken, and a hypothesis of wizardly design is the true explanation. As evidence for their claim, they bring forth their spellbooks and proceed to demonstrate how they can cause any and all meteorological phenomena. The wizards also bring forth antique books demonstrating that the existence of their wizard's circle extends throughout known human history. There is no smoking gun, but there is plenty of circumstantial evidence making the wizards' claims plausible. In this situation, many might indeed fairly reasonably accept the hypothesis of wizardly design as the best explanation for meteorological phenomena. But does it follow from this that the wizard hypothesis is the best explanation without this additional supporting evidence? Clearly this has not been demonstrated. So, the assumptions and the logic of Dembski's thought experiment can be contested by the critic.⁸⁷³

But can the assumptions and logic of the other thought experiments be similarly contested? Though the ID theorists and other defenders of the design argument often use thought experiments, critics of Intelligent Design have made relatively few comments on them in the discussion. Three exceptions are Robert Pennock's analysis of Dembski's "Incredible Talking Pulsar"⁸⁷⁴, the analysis of Del Ratzsch's bulldozer in space provided by Mark Perakh and Matt Young⁸⁷⁵, and Elliott Sober's analysis of the thought experiments in Hume's *Dialogues*.⁸⁷⁶ All three focus on the differences between the evidence of design we witness in the thought experiments and the actual evidence we have.

Pennock argues that Dembski's example is misleading because of the difference between the "Incredible Talking Pulsar" and the biological evidence: "*in each case we infer an intelligent signaller not because these are cases of complex specified information in a generic sense, but because the pattern of information matches a previously known pattern that we associate with intelligence.*"⁸⁷⁷ Perakh and Young argue that the example of an alien bulldozer, recognizable as designed despite our lack of knowledge about the designer, is misleading. Because we can recognize the bulldozer as a bulldozer, we can infer at least something about the designer's characteristics and purposes. The designer must be of a certain height to sit inside the bulldozer, he needs bulldozers to create buildings and so on. But organisms, on the other

⁸⁷³ Despite these criticisms, Dembski's example may work as evidence for a more limited claim. If we accept that design would be at least a good competitor for the title of the best explanation in the situation Dembski describes, then this seems to admit that the design hypothesis at least has some explanatory force. It is not a totally empty explanation comparable to chance, as some have argued. (See chapter 4.3.)

⁸⁷⁴ Pennock 1999, 230-233, 254, 272, 303.

⁸⁷⁵ Perakh & Young 2006, 194-195.

⁸⁷⁶ Sober 2009, 8, 168-177.

⁸⁷⁷ Pennock 1999, 254.

hand, do not have such a clear purpose for their designer. Perakh and Young also see the capacity of organisms to reproduce and undergo evolution as important: because of this capacity, the order of the organisms can be explained without design, whereas the order of the bulldozer cannot. Thus differences between the thought experiments and the evidence we actually have is crucial for the critics: *"We know nothing whatsoever about the alleged disembodied designer of the intelligent design theory or about what that designer's creations should look like. The case is therefore very different from bulldozers and poems. A reference to such a designer lacks explanatory power."*⁸⁷⁸

Sober recognizes that Cleanthes' thought experiment about the voice from heaven presents a challenge for his position that background knowledge of the designer's existence and motivations is necessary for making the conclusion of design: *"These arguments do not require us to say anything concerning how probable it is that an intelligent designer who lives in the dark or in the clouds will produce an English sentence. -- And who knows how inclined a celestial intelligence would be to boom English sentences down to Earth?"*⁸⁷⁹ Sober recognizes that Cleanthes' design argument is based on an inductively observed connection between the type of order seen and intelligent design as a cause, and grants that *"there is nothing wrong with inferring that the voice in the dark and the voice in the clouds were both probably produced by an intelligent being."*⁸⁸⁰ Yet Sober denies that this makes ID's biological design arguments plausible. His reasons for this are twofold. First, Sober argues that while there is good evidence to establish a high-frequency connection between intelligible voices and intelligent agents, there is insufficient evidence to establish any such high-frequency connection between purposeful complexity and intelligent designers. Second (and this is the more weighty criticism in Sober's own estimation), the biological design argument does not take into account theories which argue that the useful complexity of biological organisms can be formed through mindless processes. Sober is not convinced by ID's critique of evolutionary biology.⁸⁸¹ If accepted, these differences between the thought experiment and the situation of biology mean that the design argument cannot work in the same way as argument based on the "voice from heaven."

SETI-researcher Seth Shostak has also criticized the use of SETI as an analogy to biological design arguments. According to Shostak, the thought experiment of the movie *Contact* (1985) where the information content of a signal testifies of the existence of extraterrestrial life is misleading, though the idea comes from SETI-pioneer Isaac Asimov (1920-1992). Shostak argues that SETI actually does not investigate the content of signals at all, but focuses on finding an intensive narrow-wavelength signal. These sorts of signals, Shostak argues, are known to be produced by civilizations, but are not produced by nature.⁸⁸² This criticism of ID is curious, however, because Shostak's own formulation of

⁸⁷⁸ Perakh & Young 2006, 194-195.

⁸⁷⁹ Sober 2008, 171.

⁸⁸⁰ Sober 2008, 174.

⁸⁸¹ Sober 2008, 175-176.

⁸⁸² Shostak 2005.

SETI-logic seems to have the same logical structure as many design arguments. Because some property (in Shostak's example, the narrow wavelength-signal) is found, based on our experience, to be a marker of intelligent life (and cannot be well explained otherwise), then this property can be used as evidence of design. However, the same logic would seem to also allow us to conclude that a radio signal containing information (e.g. prime numbers and the blueprints for a machine) is designed, as in the ID movement's example. The basic underlying logic of the arguments is identical.

It seems to me that the critics' insistence on the difference between the thought experiments and our own situation is the most credible way to deny the conclusion of the thought experiments. Nevertheless, it seems to me that these responses to thought experiments also inevitably include make some important philosophical concessions to defenders of the design argument. Because the critics do not deny the intuitive conclusion that the order observed in the thought experiments can indeed be reliably detected as designed, they must formulate the logic of design detection in a way that makes it possible in the thought experiments, but rules it out in the case of ID's project. So, Pennock, Sober and Shostak affirm that a pattern of order which we have learned by experience to associate with intelligence can be evidence of design even outside the context of human activity. This leaves the door open for the ID proponents to argue that rationality, specified information and purposeful complexity are also traits strongly associated with intelligence. The critics' position thus seems to lead to giving up the philosophical a priori criticisms of ID. But leading the discussion to this point was the purpose of the thought experiments.

Most examples of purposeful complexity occur outside the context of human activity, so it seems correct to say (following Sober) that proponents of ID cannot argue that there is a high-frequency observed connection between all examples of purposeful complexity and intelligent design. Nevertheless, they can argue that there is some sort of a connection, which is sufficient to give ID as an explanation some content and help it overcome at least chance-based explanations in the contest for the best explanation. It would be strange to argue that the connection has to be as clear as in the case of the voice from heaven before the design argument starts to have any explanatory power at all. It seems more credible to me that the evidence of design does not have to be either completely convincing or completely absent. Perhaps the amount of evidence and the quality of arguments we have is rather somewhere between these two extremes.

Because thought experiments are hypothetical, they do not themselves provide evidence of design, but only test our concepts. In my view, the more enduring strategy of response to these thought experiments is not to argue that the situations of the thought experiments are completely dissimilar from our own, but to argue that they are sufficiently dissimilar that scepticism of design arguments is made possible. This also seems to be the point of the responses to Cleanthes' thought experiments in the *Dialogues*. These counterarguments aim more at limiting the power of design arguments and opening up the possibility for scepticism (and religious faith) rather than a proof against the very possibility

of design arguments. First, religious belief in God, in any case, is requires more than the design argument. The God of Christian theism is much more than a designer, and faith is based on grounds much broader than arguments.⁸⁸³ Secondly, the order of nature is different from the cases in the thought experiments. In nature, we do not find talking pulsars or “MADE BY YHWH” signs on particles. We do find rational order, fine-tuning and astounding complexity, but the evidence for design isn’t of quite the same nature as in the thought experiments.⁸⁸⁴

Despite these criticisms, the major point of the thought experiments seems to stand. If seeking to explain the patterns described in the thought experiments in terms of design and purpose would be rational, then this seems to make it possible to consider that there may also be other situations in which the design argument is rational, and that we may ourselves live in such a situation. If we believe that the design argument is irrational in all conceivable situations, then we reach the conclusion that no conceivable order of nature could be evidence for design. Even if we found the words “GOD MADE THE UNIVERSE” regularly created by the normal operation of the laws of nature, explaining this by reference to design would only be a vacuous God of the gaps. If the naturalist adopts this line of argument, then he can answer the design argument based on metaphysical philosophical arguments alone, rather than the empirical evidence usually valued by naturalists.⁸⁸⁵ This is line of thought that is vulnerable to the ID’ers criticism of naturalistic science as merely applied philosophy, not empirical investigation based on the unending search for truth. In this chapter, I have once again found myself defending the in principle possibility of intelligent design. This is once again in agreement with Gregory Dawes’ conclusion: *“Intelligent design theory is an attempt to explain a fact that requires explanation, and at least some of the arguments offered deserve to be taken seriously. If at the end of the day they fail to convince, it is simply because we have a better explanation available, one that makes no appeal to a mysterious cosmic designer.”*⁸⁸⁶ It is easy to criticize a “naturalism of the gaps” which allows only for natural explanation no matter what the evidence is. A naturalism based on the actual state of the evidence is much more credible.⁸⁸⁷

Or as Ross McCullough puts the point: *“There need to be criteria for when inferences to divine activity are reasonable. This is of course true, and the nature of such criteria is not obvious, depending as it does upon the phenomena in question. Still, some such criteria exist. Even the atheist can acknowledge that at some point the hypothesis needed to avoid God might become so improbable as to be unbelievable. If there were no fossil record of evolution, and snakes and birds and human beings had all just appeared suddenly in the past, the case for a divine designer would be a rather strong one.*

⁸⁸³ Vainio (2010) is one of the best recent studies of the nature of religious faith. See also chapters 2.4 and 2.5 of the present work for thoughts on faith and reason.

⁸⁸⁴ In Ratzsch’s (2001) categories, we might say that nature contains mind correlativity, but perhaps not mind affinity.

⁸⁸⁵ Collins 2005, 188-189.

⁸⁸⁶ Dawes 2007, 70.

⁸⁸⁷ Similarly Orr 2007.

The atheists who fete evolution do by their feting acknowledge this: It is just because the world is so and not otherwise that they claim belief in God is irrational."⁸⁸⁸ The thought experiments seem to show that we can imagine situations where we have plenty of evidence for a divine designer acting even in natural history. This seems to show that even the biological design hypothesis can in principle possess explanatory power, and in possible worlds it can be the most rational thing to believe.

However, does the rationality of belief in design truly depend on a competition between evolutionary biology, as the atheists McCullough references seem to imply? Couldn't a theistic evolutionist position combining design and evolutionary biology also be possible? In chapter eight, I will turn to consider ID's position on theistic evolutionism. One argument I will be making is that thought experiments can also be used to argue for the compatibility of evolutionary biology and design arguments.

⁸⁸⁸ McCullough 2013.

8. INTELLIGENT DESIGN AND THEISTIC EVOLUTIONISM

In the previous chapters, my emphasis has been on analysing Intelligent Design's conflict with naturalism. However, ID's conflict with theistic evolutionism is also important.⁸⁸⁹ Because theistic evolutionism is also opposed to the naturalistic worldview, it might initially seem plausible that the ID movement would seek to ally with theistic evolutionism. Indeed, ID theorist Paul Nelson explains that ID is meant to be a "big tent" to unite all those who believe that the order of nature is evidently designed. Nelson writes that "under the canopy of design as an empirical possibility, however, any number of particular theories may also be possible, including traditional creationism, progressive (or "Old-Earth") creationism, and theistic evolution."⁸⁹⁰ This purpose of uniting those who believe in design and oppose a purely naturalistic understanding of the universe was also behind the ID conference "Mere Creation" (1996) and the corresponding conference volume (1998). Questions about the method and timing of creation were seen as secondary to the basic idea of creation, which all Christians could accept.⁸⁹¹

In Nelson's statement, combining belief in evolution and theism appears as a possibility that is in principle acceptable to Intelligent Design theorists. However, as I argued in chapter 2.1, theistic evolution includes a variety of ways of thought. These are opposed to the naturalistic worldview of thinkers like Daniel Dennett and Richard Dawkins in many ways. Theistic evolutionists typically defend the compatibility of science and theology and the rationality of belief in God. Nevertheless, Nelson and the broader ID movement reject most forms of theistic evolutionism as highly problematic and incompatible with ID's vision. Dembski notes that while C.S. Lewis tried to defend only the essentials of Christianity in his *Mere Christianity*, proponents of Intelligent Design try to go further by developing their theory of creation so as to best oppose a purely naturalistic (and atheistic) understanding of the world.⁸⁹² In the opinion of the mainstream of the ID movement, theistic evolutionism fails to properly challenge the atheistic understanding of the universe.⁸⁹³

Some theistic evolutionists have also criticized ID in strong words. For example, as I showed in chapter 2.5, theologian Conor Cunningham even argues that ID comes close to being a heresy, and those those accept ID's design arguments are led away from the

⁸⁸⁹ For example, the ID blogs *Evolution News and Views* and *Uncommon Descent* contain frequent critiques of theistic evolutionism alongside critiques of evolutionary biology and naturalistic views. Richards (2010) is a collection of ID-articles with the common goal of critiquing theistic evolutionism.

⁸⁹⁰ Nelson 2002. This view of Intelligent Design was more closely argued in the introduction, where works like Giberson & Yerxa 2002 were also referenced.

⁸⁹¹ The title references the work of C.S. Lewis, who wanted to define the essence of Christian doctrine in a way acceptable to all Christians in his book *Mere Christianity*. (Lewis 2001, originally published 1942-1944).

⁸⁹² Dembski 1998, 13-14.

⁸⁹³ Richards 2010.

knowledge of the true God: “the god of Intelligent Design” is one that orthodox Christians should find “diabolic”, and as destructive to true faith as Dawkins’ atheism.⁸⁹⁴

In my assessment, the ID theorists’ four central lines of argument against theistic evolutionism are (1) the evidential argument; (2) the argument from apparent contradictions, (3) the argument against Darwinism as a worldview, and (4) the argument from the insufficiency of theistic evolution. In this chapter, I will analyse these lines of argument to clarify the relationship between Intelligent Design and theistic evolution. In analysing each line of argument, I contrast Intelligent Design with some defences of theistic evolution, finding tensions in each of these lines of argument. However, I will not be arguing that ID is heretical.⁸⁹⁵

8.1. The Evidential Argument

ID’s Emphasis of the Importance of Scientific Evidence

As I have argued throughout this study, the ID movement emphasizes the importance of empirical research in deciding what sort of natural history our world has. In chapters 3.4 and 3.5, I argued that a basic assumption the ID theorists make is that theological and philosophical reasons cannot eliminate the possibility that there is evidence of design in nature. As I showed in chapter 6, the ID theorists believe that the empirical evidence shows the inadequacy of evolutionary theory. Because of this, they believe that the evidence is also against theistic evolution as a model of divine action in history, and that a model where an intelligent designer’s (God’s) activity is seen as an important explaining factor of natural history is better. The evidential argument against theistic evolution is that this type of open evaluation of the evidence leads to the rejection of theistic evolution.

As I showed in the introduction, in the rhetoric of the ID theorists, they are the open-minded and honest scientists looking for the truth, whereas defenders of the theory of Darwinian evolution are influenced by philosophical and religious bias. Similarly, the ID theorists emphasize that their rejection of theistic evolutionism is primarily based on scientific reasoning, rather than theological reasons. The evidential argument against theistic evolutionism is simply that the relevant science renders theistic evolutionism unnecessary. According to Dembski, “the design theorists’ critique of Darwinism begins with Darwinism’s failure as an empirically adequate scientific theory, not with its supposed incompatibility with some system of religious belief”.⁸⁹⁶ Dembski has also written that he doesn’t know of “any ID advocate who claims that Darwinian evolution entails atheism.”⁸⁹⁷ This is correct, but as I will show, many ID advocates, including Dembski himself, do think that Darwinian evolution tends to be

⁸⁹⁴ Cunningham 2010, 280.

⁸⁹⁵ Chapter 8 is an updated and expanded version of Kojonen 2013.

⁸⁹⁶ Dembski 1998, 112.

⁸⁹⁷ Dembski 2011.

linked with atheism, even if it atheism is not an absolutely necessary conclusion from evolutionary theory.

In the evidential argument, it is assumed that there is a need for the harmonisation of scientific theories and religious beliefs only when the scientific theories are likely to be correct. Thus Jay Richards argues that prior to examining “such arcane possibilities” as the compatibility of Darwinism and theism, we should first ask the prior question of whether Darwinian evolutionary theory is even true.⁸⁹⁸ If the theory is not true, then there is no need to harmonize it with Christian belief. On one level there is truth to Richard’s argument. If Darwinian evolutionary biology is not true, then the need for harmonizing it with Christian belief seems far less pressing. Were Darwinian evolutionary biology to become broadly rejected, we would probably see far fewer articles about its compatibility with theism in journals of religion and science. Similarly, currently there is little interest in articles about the compatibility of phlogiston theory and theism.

However, on another level such a harmonisation might still be useful even from the point of view of the ID theorists for four reasons. First (1), the question of the in principle compatibility of natural processes and belief in creation is an interesting one. If theism and Darwinism are compatible, then understanding this possibility might provide us with a better understanding of the basis of Christian belief, the nature of the doctrine of creation, and its relationship to scientific theories. Second (2), a broader use of good theological and philosophical arguments, such as those theistic evolutionists rely on, would strengthen ID’s overall argument against naturalism and scientism. Third (3), the theory of evolution is currently widely believed to be true in academia, even by many who are acquainted with the ID theorists’ critique of Darwinism. Theological and philosophical arguments could help these people avoid embracing atheistic metaphysical interpretations of Darwinian evolutionary biology. Even if a scientific theory is likely to be incorrect, showing its compatibility with belief in creation might still be interesting, if the theory is widely believed to be true. Fourth (4), the acceptance of theistic evolutionism as a philosophically and theologically defensible position would help avoid the impression that theological reasons are important motivations for ID’s own opposition of evolutionary biology.

Theistic evolutionists and the mainstream of the scientific community disagree with these claims and argue that the acceptance of evolutionary theory is the most reasonable response to a broad variety of scientific evidence. However, even if the problematic nature of evolutionary theory is granted, these four reasons lead to me to think that the evidential argument should also not be a sufficient reason to reject discussion of theistic evolutionism.

⁸⁹⁸ Richards 2010, 302.

The Implicit Importance of Theology for ID

There is a further tension in the ID movement's evidential argument. As I have shown in chapter 3.5, the Intelligent Design theorists are not opposed to the idea that the designer of life could have worked through natural laws and mechanisms. They emphasize that God as a free agent could have used any means to create the species, including Darwinian evolution. Taken consistently, this should lead to the acceptance of the possibility that God has in fact used Darwinian evolution.

However, despite this emphasis, the ID theorists often portray design and Darwinism as opposed viewpoints. As they understand it, the very point of Darwinian explanations is to attempt to explain away the apparent purposiveness of nature. For example, Dembski's argument that the Intelligent Design theorists are not motivated by their theology comes after several pages discussing theological problems with the harmonisation of theism and Darwinism. Thus while Dembski does not argue that Darwinism entails atheism, he does believe that there are substantial problems in reconciling Darwinism and theism.⁸⁹⁹ Phillip Johnson has also argued extensively that there is a conflict between what he terms the "blind watchmaker" thesis of evolution and theism.⁹⁰⁰ Johnson argues that the Darwinian way of thought rules out an evidentially based belief in creation, but still leaves room for religion which is chosen for subjective reasons.⁹⁰¹ Stephen Meyer, too, has criticized theistic evolution as being indistinguishable from materialism.⁹⁰² Behe admits the possibility of theistic evolutionism in principle and even calls theistic evolutionist John Haught a believer in intelligent design.⁹⁰³ However, elsewhere Behe too writes that the followers of theistic evolution "*are kidding themselves if they think it is compatible with Darwinism*" as it is understood by the mainstream scientific community.⁹⁰⁴ Behe also argues that intelligent design provides important confirming evidence for faith. Behe admits that theistic evolutionists may have other evidence to corroborate their faith, and that their position is not self-contradictory, but nevertheless finds Intelligent Design more satisfying even theologically.⁹⁰⁵

The impression these accounts give is that for the ID theorists, a combination of Darwinism and theistic belief is possible, but this leaves theistic belief much weaker. The argument is that there is a tendency to slide from theistic evolutionism to the more consistent positions of materialism or Intelligent Design. Even if the ID theorists don't argue that Darwinian evolution logically entails atheism, they at least argue that atheism logically requires something like Darwinism to escape the evidence for creation. The impression one

⁸⁹⁹ Dembski 1998, 112.

⁹⁰⁰ Johnson 2001.

⁹⁰¹ Johnson 1993, 155-157.

⁹⁰² Meyer 2010.

⁹⁰³ Behe 1999a.

⁹⁰⁴ Behe 2007a, 229.

⁹⁰⁵ Behe 1998a; 1999b, 2005b.

gets is that while God may have used any method for creation, for the ID theorists it would be theologically desirable that he did not choose a Darwinian mechanism. Thus their ideal of openness to many different accounts of natural history does not mean that they have no theological or moral preferences for what sort of method God should have used.

The ID movement's idea that empirical evidence should define what we believe about God's interventions in natural history seems appealing. As I discussed in chapter 7, it seems difficult to form a convincing theological argument for totally ruling out the possibility of God's interventions into natural history prior to the examination of the empirical data. However, the ID theorists' defence of this principle would be more credible if they did not at the same time also argue that Darwinian evolutionary biology and belief in design are not necessarily opposed. Currently it seems that they do have a strong metaphysical preference favouring non-Darwinian accounts of the origin of life and the biological species.

To be fair, I want to note that the same tension is also present in some defences of theistic evolution, as well. In chapter 7, I showed saw that many see ID's design argument as a theologically undesirable "God of the gaps"; in chapter 9, I will show see that ID's design argument is also sometimes thought to make responding to the problem of evil more difficult for theists. Many theistic evolutionists thus have a strong theological preference for the idea that God used evolutionary methods of creation. These thinkers typically hold both that (1) acceptance of evolutionary theory is based on the evidence, not primarily theology, and that (2) there are highly pressing theological reasons for preferring theistic evolutionism to forms of creationism. These principles are in tension, just as the ID movement's principles are in tension.

Robin Collins' defence of theistic evolution provides a model that I would recommend to defenders of theistic evolution. Collins argues that there is no good, well-developed and convincing argument for rejecting an "interventionist" account of the laws of nature, where God intervenes into natural history in addition to working through the laws of nature. Thus the theistic evolutionist does not begin from a theological account which precludes God's interventions, but on the basis that of the "*well-established theory that life on Earth arose through the process of biological evolution, by which I mean the process of descent with modification from the first cell.*"⁹⁰⁶ Then, because of the acceptance of the theory of evolution, a theistic evolutionists (of Collins' mold) looks to understand the reasons God had in choosing to work in this way.

8.2. The Apparent Incompatibilities

Design and Darwinism as Explanations of the Same Data

The second line of argument the ID movement uses against theistic evolutionism is based on the supposed incompatibility of Darwinian evolutionary explanations and design. In the

⁹⁰⁶ Collins 2009, 243.

history of design arguments, natural causes and the effect of minds have not always been opposed. Plato's demiurge, for example, created by using matter's existing properties, not out of nothing or contrary to laws of nature. For the death of Socrates, Plato saw several causes. While the poison drunk by Socrates was the material cause of his death, it would have been an error to see only this side of the issue. Instead, the political situation of Athens and the plans and purposes of both Socrates and his opponents were also important to note. For Plato, material and teleological explanation were thus complementary levels of explanation. On this model, a design argument is not necessarily in conflict with material explanations.⁹⁰⁷

The possibility of combining divine design and natural processes is also evident within the Christian tradition. The distinction made in Thomistic philosophical theology between primary and secondary causes remains useful and defensible. Divine action in the world does not require gaps in the web of natural processes, since God can also be conceived to act in the world through secondary causes. A common example of the combination of divine purpose and natural causes is the conception of each individual human being. Christians have traditionally believed both that each individual is created by God, and that this happens through a natural process.⁹⁰⁸ As I pointed out in chapter 7.2, Christians have also traditionally believed that sometimes God does bypass the regular order of nature to act miraculously in the world. However, this does not need to be conceived as opposed to the natural laws.⁹⁰⁹

The Intelligent Design theorists are not opposed to the idea that the designer of life could have worked through natural laws and mechanisms. For them, design and natural causes are both real. As Behe writes, the alternatives are not that of "*a cartoon world, where genies and fairies swirl about endlessly dispensing magic, or a world of relentless materialism where, say, the charitable work of a Mother Teresa is explained only in terms of evolutionary selection coefficients.*"⁹¹⁰ The ID theorists often argue that ID does not require interventions by God in natural history. Behe, for example, argues that the process of evolution could be programmed into the universe⁹¹¹, and Dembski argues that design could be inserted into the universe in quantum events without violating the laws of nature.⁹¹² Dembski and Well distinguish between several different meanings of the word "evolution", most of which they believe to be compatible with Intelligent Design. For example, evolution can mean simply change over time or minor changes within existing organisms, or it can mean the idea of common descent, or the power of the Darwinian mechanism of mutation and selection, or

⁹⁰⁷ Sedley 2007, chapter 4.

⁹⁰⁸ Hart 2014, chapter 1.

⁹⁰⁹ On this discussion, see Earman 2000 and Keener 2011, chapter 5.

⁹¹⁰ Behe 1999a.

⁹¹¹ E.g. Behe 2007, chapter 10.

⁹¹² Dembski 2002a, 333-337.

some other evolutionary mechanism such as described in the theories of endosymbiosis or neutral theory.⁹¹³

The central point of contention they see between design and evolution comes from the special nature of the Darwinian mechanism. As Jonathan Wells argues, *“it is not evolution in general, but Darwinism’s exclusion of design, that ID proponents reject.”*⁹¹⁴ Using Plato’s categories, while other natural explanations work on the level of material causes, Darwinism also attempts to reduce teleology to material causes. It attempts to provide a wholly naturalistic explanation of teleology, and to thus render references to purpose and direction unnecessary. Plato criticized the Epicurean system, which argued that teleology is ultimately reducible to material causes.⁹¹⁵ Advocates of Intelligent Design contend that Darwinian evolution and design are similarly opposed. This is the argument from the apparent contradiction between Darwinism and design.

Because of the many different definitions of evolution, the ID theorists see it possible to define “theistic evolution” in a way that is compatible with the design argument of the ID movement.⁹¹⁶ Theistic evolutionism in the sense of belief in evolution actively directed by God is held to be a possible way of believing in creation.⁹¹⁷ However, this form of directed evolution is believed to be in contradiction with standard Darwinism.⁹¹⁸ Undirectedness is understood to be part of the very definition of the Darwinian process. According to Johnson, *“‘Evolution’, honestly understood, is not just a gradual process of development that a purposeful Creator might have chosen to employ. It is, by Darwinist definition, a purposeless and undirected process that produced mankind accidentally.”*⁹¹⁹ The Intelligent Design theorists thus understand Darwinian evolutionary theory to include the denial of purpose and direction to evolution. The Intelligent Design theorists thus share Richard Dawkins’ understanding of the aims of Darwinism. Dawkins’ definition of evolution as the “blind watchmaker” is quoted over and over again in the ID literature, and is understood to be mainstream Darwinism.⁹²⁰

The contrast the ID theorists make is then between the origin of the species as purposeful and directed in the theistic story and evolution as purposeless and undirected in the naturalistic story of origins.⁹²¹ Despite this seeming contradiction, many theistic evolutionists have attempted to harmonize belief in design and Darwinian evolution. It is this synthesis which many ID theorists criticize.⁹²² According to Dembski, *“Theistic evolution takes the Darwinian picture of the biological world and baptizes it, identifying this picture with the way God created life. When boiled down to its scientific content, however, theistic evolution is no*

⁹¹³ Dembski & Wells 2007.

⁹¹⁴ Wells 2010, 119. Similarly Meyer 2010, Dembski 1998, Johnson 1993.

⁹¹⁵ Sedley 2007, chapters 4 and 5.

⁹¹⁶ Meyer 2010, 147.

⁹¹⁷ Johnson 1993, 4n1.

⁹¹⁸ Meyer 2010.

⁹¹⁹ Johnson 2001, 436.

⁹²⁰ E.g. Johnson 2001, 436; Meyer 2010, 148. See Loesberg 2007 for some further examples.

⁹²¹ Richards 2010, 7-25.

⁹²² I have noted Behe’s somewhat different take on the issue above in chapter 8.1.

different from atheistic evolution, treating only undirected natural processes in the origin and development of life."⁹²³ Dembski argues that by Occam's razor, consistent theistic evolutionists should either argue that evolution is directed, in opposition to Darwinism, or give up the label "theism" as superfluous to their understanding of evolution.⁹²⁴ The idea here is that design and Darwinism are different explanations of the same facts of apparent design in biological organisms. They occupy the same scientific explanatory space. If one believes in Darwinism, design becomes unnecessary, and vice versa. To phrase it in Plato's categories, the ID theorists see Darwinism as an attempt to reduce the teleology of organisms to material causes.

Two Examples of Theistic Evolutionism

The ID movement's critique of theistic evolutionism will become easier to understand and criticize when contrasted with concrete examples of how the integration of Darwinian evolutionary theory and belief in God is defended. I will now look at two cases where the Intelligent Design movement has interacted with these views directly: Stephen Meyer's critique of Dennis Lamoureux' evolutionary creationism⁹²⁵ and William Dembski's critique of Simon Conway-Morris' view that the phenomenon of convergence allows us to see a direction in evolution.⁹²⁶ Many other ways of defending theistic evolutionism also exist, but here I focus on ways that the ID movement has interacted with.⁹²⁷

According to Lamoureux, *"the Creator established and maintains the laws of nature, including the mechanisms of a purpose-driven teleological evolution."*⁹²⁸ Lamoureux argues that we can see design in nature at a level deeper than biology. Like a brilliant billiard player, who can sink all the balls of the billiard table with one shot, God has made the evolution of humans possible already with his initial act of creation. For Lamoureux, the process of the evolution of life is also comparable to the development of an embryo into an adult, directed by natural laws. Lamoureux argues that in fact, designing a universe to create the living species takes more divine wisdom than creating an unfinished universe and then creating species miraculously. In our universe, while no references to design are necessary on the level of proximate biological explanations, ultimately all of the workings of nature reveal the existence of its Creator, and cannot be properly understood without reference to him. Lamoureux affirms the value of the design argument, and even calls his own view a form of

⁹²³ Dembski 1998, 110.

⁹²⁴ Dembski 1998, 111-112. While Dembski presents these as the ideas of mainstream biologists, he does not critique their logic.

⁹²⁵ Meyer 2010b.

⁹²⁶ Dembski 2004c.

⁹²⁷ See Peters & Hewlett 2003 for an excellent discussion of varieties of theistic evolutionism. See also chapter 2.1. of the present study for a brief synopsis of varieties of theistic evolutionism.

⁹²⁸ Meyer 2010, 149.

intelligent design. However, he critiques the Intelligent Design movement for opposing Darwinian evolutionary theory and design arguments.⁹²⁹

Meyer is not satisfied with Lamoureux's harmonization of theism and evolutionary biology. His central argument is that Lamoureux's account of the evolution of life does not differ sufficiently from materialistic stories, and thus does not really explain by reference to design. As an example, Meyer uses the origin of life's biological information. Meyer sees two main coherent possibilities for explaining its origin. Either the information which makes life possible comes directly from the mind of the designer, or it is mediated by deterministic natural laws. However, Meyer argues that self-organizational models have failed to explain the origin of life's information. However, suppose that Lamoureux wants to base his theory of life's origins on contingent, accidental chemical events, which natural selection then works on. According to Meyer, in this case the contingent processes of chemical accidents do most of the work of creation instead of a personal Creator.

Meyer's conclusion in critiquing Lamoureux is that *"it is difficult to see how Lamoureux's theory – – differs in substance from conventional materialistic theories of evolution that rely on undirected contingency and deny any intelligent guidance or direction in the history of life."*⁹³⁰ Meyer's idea here is that the deity does not have a much greater role in this sort of theistic evolutionism than in standard materialist theories of life's origins. Thus belief in the deity's direction in evolution is explanatorily unnecessary. Meyer acknowledges that Lamoureux believes the Creator designed natural laws which allow for the interplay of natural laws and natural events to create living organisms. However, for Meyer such a role is too small for the Creator. He wants the evidence to reveal the Creator's active involvement in the creation of life beyond the laws of nature.⁹³¹

Dembski makes many of the same points in his critique of Simon Conway-Morris' defence of theistic evolution. Paleontologist Conway-Morris develops his argument in his book *Life's Solution: Inevitable Humans in a Lonely Universe* (2003). Conway-Morris's argument is based on the phenomenon of convergence. Evolutionary convergence means that similar features have evolved several times apparently independently during the course of evolution. Conway-Morris believes that convergences show that the course of evolution is to at least some extent determined by the natural laws and conditions of our universe. Extrapolating from this, it could be that even the emergence of human-like organisms is ultimately determined by the natural laws. Thus it could be that God directs the course of Darwinian evolution through such natural constraints. Conway-Morris argues that the evidence from convergences supports the possibility of a theistic view of evolution, where the direction of evolution is built in by the Creator into the natural laws.

Dembski's critique of Conway-Morris position is that the biological evidence from convergence only shows that evolution is *"limited to fixed paths, not that it has goals."* Dembski

⁹²⁹ See e.g. Lamoureux's contribution in Johnson & Lamoureux 1999.

⁹³⁰ Meyer 2010, 162.

⁹³¹ Meyer 2010, 163.

acknowledges that Conway-Morris has given some evidence for the teleological nature of evolutionary processes. However, Dembski does not see this as being strong enough evidence. Design remains merely a metaphysical possibility, not a necessary component of explanation. According to Dembski, Occam's razor also cuts against these sorts of design arguments: since design is not necessary, we can be content by simply believing that the process of evolution was natural, and that contingent processes inside nature are responsible for the direction. Both Dembski and Meyer emphasize the need for evidence to determine the question of evolution's purposiveness. To discover whether evolution was directed, they argue that we should look at the details of the process itself, ask where the limits of the natural processes are, and whether design is required to explain that which lies beyond those limits. Dembski's assumption here is that we need evidence of design, and further that this evidence should be strong and scientific in nature.⁹³²

As I argued in chapter seven, the ID theorists have denied that their argument is reducible to a fallacious argument from ignorance or a God of the gaps. After all, they also try to present positive evidence of design, and believe that it is possible for God to work through nature. However, in these critiques of theistic evolutionism they give the impression that gaps in the abilities of natural processes are required for a robust defence of the design argument. Meyer and Dembski want to discover evidence of intelligent design on the level of biology, teleology which cannot be explained other than by reference to the purposes of a designing mind. Because of this, they do not appreciate Lamoureux's and Conway-Morris' arguments which aim to discover evidence of design not on the level of biological theory but on the underlying explanatory level in the fine-tuning of natural laws.

However, it should be asked whether Meyer and Dembski do justice to theistic evolutionism in their critiques. While Meyer is correct in pointing out that Lamoureux's explanation does not differ from materialist Darwinists on the level of biological details, it does not seem to follow that Lamoureux's evolutionary creation -view contains no "substantial" differences from atheistic views on any level, as Meyer claimed. After all, Lamoureux agrees with the proponents of Intelligent Design, and against materialism, that (1) the ultimate basis of reality is personal, (2) there is evidence of design in nature, and (3) atheistic interpretations of nature can be opposed with rational arguments. Lamoureux is not an atheist, but believes in a God who is active in the world, even performing miracles. So, Lamoureux agrees with many of the Intelligent Design movement's core ideas. It seems that their critique of theistic evolutionism carries the ID theorists from their basic "big tent" strategy, which was an attempt to unify those who believe in design and oppose scientific atheism.

Suppose that theistic evolutionists' account of chemical and biological evolution does not differ on the level of biological science from those of atheistic evolutionists, as Meyer and Dembski argue. It doesn't seem to necessarily follow from this that design could not be perceived even in biology when taking a wider perspective. Even if there is no design

⁹³² Dembski 2004c.

required on the level of proximate biological explanations, it does not follow that there is no design required on any underlying explanatory level. Lamoureux's argument is that the very possibility of Darwinian evolution depends on the existence of natural laws and conditions which biology takes for granted. If natural laws are designed, then the possibility of Darwinian evolution requires design. If that is the case, then the apparently purposeful complexity in biological organisms depends on design, and cannot be said to be produced without design. Although design is not a proximate cause of evolution, it can be the ultimate explanation for its possibility. As Del Ratzch has argued, "design is not a causal irrelevance" in explaining biological complexity, if the natural laws were designed.⁹³³

Dembski argues that Conway-Morris does not present sufficient evidence for the teleology of evolution. Conway-Morris' point was arguably not to present undeniable evidence that evolution was directed, but rather to argue that theistic evolution is a coherent and rational possibility. Conway-Morris shows that it is an error to think of mutation and selection as the only factors in evolution. Rather, the different biological forms can be seen as built into the laws of nature. Conway-Morris' argument shows one way in which God could direct evolution, even though the mutations seem accidental from a scientific point of view. It could simply be that all of the possible natural events will tend to lead evolution along certain paths which are predetermined by the characteristics of the universe. In this way, God could make even accidental evolutionary events work towards his purposes in creation.

If the intelligent designer of biological life were thought to be like a human engineer working within the possibilities afforded by the laws of nature, the opposition between random chance and design would be more convincing. For such limited designers, it would be more difficult to utilize chance and natural processes as part of engineering.⁹³⁴ However, considered from the point of view of a classical theology of creation, the contrast between random contingency and design which the Intelligent Design theorists make is dubious. If there are contingent events in the world, then these can only be events which are made possible by the structure of the world which God has created and which are allowed and foreseen by God. Divine foreknowledge could also enable God to create life through a "random" process, since God would know beforehand what results the random process would produce. Thus teleology could be built into the Darwinian process without a logical contradiction.⁹³⁵

⁹³³ Ratzsch 2001, 130.

⁹³⁴ Even within human engineering the use of chance as part of the design process is not unheard of, as the use of evolutionary computer algorithms in engineering demonstrates. I will come to this in more detail later in chapter 8.2.

⁹³⁵ See further McGrath 2009, chapter 7. Another possible theistic option of dealing with randomness would be to adopt scientific antirealism. The randomness of mutations could be argued to be the best scientific description of mutations, while simultaneously arguing that arguments outside science should lead us to doubt that this is ultimately the correct picture of the world, and that in fact evolution has been directed by God. Parallels to this sort of anti-realism exist elsewhere: for example, in the early part of the 20th century, antirealism was the mainstream position of scientists on the existence of non-observable molecules. For discussion of scientific realism and anti-realism in relation to theology, see McGrath 2001. For more on varieties of theistic evolution, see my chapter 2.1.

Dembski dismisses Conway-Morris' argument as nonscientific, and as not giving enough evidence for belief in purpose. What is enough evidence is subjective – Dembski admits that Conway-Morris has given at least weak evidence. However, Dembski's critique is interesting, since the ID movement itself has recognized that its design argument cannot prove the existence of a Creator. There is a gap between belief in an "intelligent designer" and belief in the Creator God. Thus the ID movement has argued that its design argument only provides "epistemic support" for belief in creation. But isn't this the same sort of evidence that Conway-Morris presents? Dembski seems to want scientific evidence for a Creator, but couldn't belief in the Creator rest more on extra-scientific reasons? Meyer and Dembski think that theistic evolutionism should differ from atheistic evolutionism on the level of the natural sciences in order to be properly theistic. But this overlooks the fact that most theistic evolutionists think the theological interpretation of evolutionary biology is a matter that is outside the competence of the natural sciences to address. I will look at this issue more below while dealing with the ID movement's fourth line of argument against theistic evolutionism.

The Compatibility of Evolution and Design Arguments

The common understanding is that Darwinian evolution undermines biological design arguments, but is perhaps compatible with cosmic design arguments. So, in arguing that biological design arguments and Darwinian evolution are incompatible, the thinkers of the ID movement are in good company.⁹³⁶ But it may also be possible to combine belief in biological design with acceptance of Darwinian evolution, and the discussion on ID already contains the seeds of this kind of approach.

Del Ratzsch has presented several interesting thought experiments to argue that design could be evident even without gaps in natural processes. Consider the possibility of an automated VCR (Video Cassette Recorder) factory. In this case one could give a "complete causal account of the production and physical properties of VCRs from the initial factory state. But we'd still feel that something was missing – that there was something about the factory itself, perhaps implicit in the "givens" that demanded special explanation."⁹³⁷ According to Ratzsch, this would be true even if the explanation for some order like this could be traced back to the Big Bang. Explaining the VCR's production in terms of the properties of the factory would leave

Rarely, members of the ID movement also point out the relevance of the creator's foreknowledge for combining chance and design. Behe (2007a, 231-232) writes that "an über-physicist" with sufficiently advanced technology to create a new cosmos and to be able to predict the events of that cosmos could create a cosmos where life evolved through a chance-driven process without the designer's intervention. The ID movement's major criticism of these types of scenarios is that in them the process of evolution appears undesigned from the human standpoint, thus leaving humans with too little evidence of the creator. I will analyse this line of argument in chapter 8.4.

⁹³⁶ Even Alister McGrath (2009b) presents Darwinian evolution as refuting at least Paley's biological design arguments, while arguing that Darwinism does leave room for a wider teleology.

⁹³⁷ Ratzsch 2001, 130-131.

something unexplained that we would still have to explain through design. If the properties of the factory itself are designed, then this designedness “is not a simple causal irrelevance, given that without that factory’s designedness the VCRs would fail both to exist and to have key physical properties they in fact have.”⁹³⁸

In Ratzsch’s model of design detection, mind correlativity and mind affinity – the correspondence of patterns in nature with patterns in our minds – are clear signs of design in the context of human artefactuality. But even if we find these designs outside this context, these properties constitute at least some evidence for design. For example, suppose that the text “John 3:16” was clearly carved into the surface of the Moon by meteor strikes. Even if we could trace the causal history of this text back to the big bang, and there was thus no context of artefactuality, it would be clearly designed.⁹³⁹

The point of these thought experiments is to make the strategy of “level-shifting” analysed in chapter 5.3 also applicable to biological design arguments. Supposing that biology also has this sort of properties that are evidence of design in the presence of gaps, the argument is that they could in principle be some sort of evidence of design even if their order can be traced back to the initial state of the Big Bang with no gaps in the natural processes that could be filled by supposing the intervening activity of a designer. An omnipotent designer who could design even the laws of nature would not in principle have need of any such gaps, since he could create any outcome he wanted without interventions.

In this type of view the possibility of cosmic design arguments makes it possible to also argue that the biological organisms created by evolution are designed, since their order also depends on the natural laws. But for some other thinkers, the train of thought runs in the other direction. If the order of VCR’s can be explained without design in the case of the automated factory, then it can be argued that the automated factory can also probably be explained without design. In effect, this is the strategy taken up by Richard Dawkins in his *God Delusion*. According to Dawkins, Darwinian evolution functions as a “consciousness-raiser” which shows that teleology can be reduced to material processes. According to Dawkins, “a deep understanding of Darwinism teaches us to be wary of the easy assumption that design is the only alternative to chance, and teaches us to seek out graded ramps of slowly increasing complexity. – After Darwin, we should feel, deep in our bones, suspicious of the very idea of design.”⁹⁴⁰ Dawkins argues that since Darwinism shows that reductionistic explanations for teleology are possible, it provides grounds for the reduction of all teleology to non-intentional material causes. This is one point where ID theorist Johnson agrees with Dawkins – according to Johnson, Darwinism lends credence to such reductionism, and thus includes a way of thought which is contradictory with cosmic design arguments as well.⁹⁴¹

⁹³⁸ Ratzsch 2001, 130-131.

⁹³⁹ Ratzsch 2001, 63. With his thought experiment, Ratzsch goes on to argue that in cases of divine design, natural law and evidence of design need not be opposed, since God can also work through natural laws, not just in counterflow to them.

⁹⁴⁰ Dawkins 2006a, 139.

⁹⁴¹ Johnson 2010, chapter 4.

But Dawkins' argument seems to assume what he is trying to prove. Dawkins argues that because Darwinian evolution produces what appears to be purposeful complexity without teleology, it is possible to reduce all teleology in just this way. However, how does Dawkins know that Darwinian evolution requires no purposeful design? Following the analogy of the factory, it is possible to believe that while no teleology is required on the level of proximate biological explanations, Darwinism itself ultimately depends on teleology built into the universe. If this is true, then the Darwinian process does not work without teleology – the designedness of the universe is not irrelevant to the production of organisms. To prove his first premise – that Darwinian evolution does not require design – Dawkins therefore also has to assume his conclusion, that there is no design on the cosmic level.

In my view, the combination of Darwinian evolutionary biology and design in the way envisaged by Ratzsch is an interesting possibility which deserved more study. Perhaps the order of organisms could still provide at least weak evidence of design, even in the presence of natural explanations. Surprisingly, ID literature itself contains ingredients which I believe could be used to develop this argument more rigorously. As we saw in chapter four, the ID theorists Benjamin Wiker and Jonathan Witt also argue that we can appreciate the beauty of biological organisms better when we realize how much fine-tuning is required for this beauty to be possible. The converse could also be true: we can appreciate the fine-tuning required for life better when we look at the remarkable complexity and “designedness” visible in organism. In a way, one could argue that on the evolutionary view, the fine-tuning and rationality of the whole cosmos becomes clearly visibly in the order of biological organisms. Even someone who is not well versed in physics could see the evidence of design by looking at the organisms which make the fine-tuning of the cosmos visible.⁹⁴² Based on these ideas, perhaps an argument could be developed to the effect that the order of biological organisms can still testify of a Creator, even if the proximate explanation for this order is Darwinian evolution.⁹⁴³

The extent to which the possibility of Darwinian evolution depends on the fine-tuning of the laws of nature affects the strength of this argument. Here Conway-Morris' argument is helpful, since it seems to show that the forms of biological life follow certain fixed patterns which could be determined by the natural laws. Further, as I argued in chapter 6.4, many of ID's arguments for the improbability of Darwinian evolution (such as Behe's argument from irreducible complexity) could be reformulated as arguments for the amount of fine-tuning required by evolution. In order for the evolution of irreducibly complex structures to be possible, evolutionary routes that make this possible must exist. In this way, it could be

⁹⁴² Perhaps a comparison to icons as used in Eastern Orthodoxy will help further explain this view for some. Organisms are like icons in that the rationality of the whole cosmos is both seen through particular organisms and also present in each of them.

⁹⁴³ Ratzsch (2001, 59) similarly argues that “if something would constitute evidence of design in the context of some presumed gap in nature, then it will also constitute evidence of design even if the gap in question gets closed naturally”. Thus Darwinism does not, according to Ratzsch, necessarily threaten the biological design argument.

argued that as Darwinian evolution weakens all gaps-based biological design arguments, it boosts design arguments based on cosmic fine-tuning correspondingly.

Intriguingly, Dembski himself has proposed a similar reconciliation of design and evolution. The argument is based on Dembski's "law of conservation of information", the claim that any random search capable of generating information can only do so because it is directed by information. The idea is already presented partially in Dembski's *No Free Lunch* (2002), but more clearly in a later article.⁹⁴⁴ Dembski and Robert Marks argue that applying the law of conservation to information creates the result that "*when natural systems exhibit intelligence by producing information, they have in fact not created it from scratch but merely shuffled around existing information.*"⁹⁴⁵ While evolutionary computer algorithms are often used to demonstrate the power of the Darwinian mechanism of mutation and selection to generate order, Dembski and Marks argue that such algorithms also show the limits of the mechanism. They argue that information can only be generated by evolution when it is built into the process. This is also shown by the fact that it is possible to generate algorithms which rely on mutations and selection and which do not generate any interesting results.

Their point is that engineers have to carefully construct these simulations so as to make the Darwinian mechanism do what it needs to do. To make a successful search algorithm, "active information" generated by a mind is required. After arguing this in a highly technical manner, they are ready to make an analogy: "*In these models, careful tailoring of fitness functions that assist in locating targets is always present and clearly teleological. If these models adequately represent biological evolution, then this teleological feature of fitness ought to be preserved in nature, implying that Darwinian evolution is itself teleological.*"⁹⁴⁶ The evaluation of their argument here is beyond the purposes of this study, but it is interesting to note that with their model of teleological Darwinism Dembski and Marks come rather close to theistic evolutionism. In their article, Dembski and Marks themselves do not mean to say that their model of teleological Darwinism is close to theistic evolutionism. Rather, they argue that theistic evolutionism means by definition belief in the teleology of evolution without any evidence.⁹⁴⁷ However, this seems like a semantic quibble, since Dembski and Marks agree here with theistic evolutionists that the Darwinian process can be designed by God. There is a tension between their arguments for the possibility of teleological evolution and the claim that belief in Darwinian evolution is in tension with believing in design.⁹⁴⁸

⁹⁴⁴ Dembski 2002a, chapters 3 and 4.

⁹⁴⁵ Dembski & Marks 2009.

⁹⁴⁶ Dembski & Marks 2009, 31. This argument could perhaps be supplemented by using the ID theorists' critique of the Darwinian mechanism. For example, as we saw in chapter two, Behe argues that nature contains "irreducibly complex" systems whose evolution through natural selection would require extremely circuitous and improbable pathways. If Behe is correct, then an evolutionary algorithm which can produce these structures would indeed be difficult to construct.

⁹⁴⁷ Dembski & Marks 2009, 6.

⁹⁴⁸ Together with Dembski's treatment of theistic evolution in his *The End of Christianity* (2009), it might even be argued that Dembski is moving towards a more inclusive and open approach to the issue of evolution and design.

Though a general opposition between natural processes and divine action is a mistake, this does not mean that some ideas of divine action could not require rejecting natural explanations. All gaps-arguments such as those analysed in chapter 7 are made in opposition to natural causes, and it seems to be in principle possible that there are gaps in the abilities of natural processes. Also, historically miracles like the bodily resurrection of Jesus have been thought to be in conflict with naturalistic explanations. For example, it would be strange to argue that the disciples actually stole the body of Jesus from the tomb and buried him in an unmarked grave, but that this was merely God's way of accomplishing the resurrection of Jesus. In chapter 5.3, I argued that some examples of "level-shifting" are not plausible. This will have to be decided on a case by case basis. But the arguments that Darwinian evolutionary biology and design are necessarily conflicting explanations do not yet seem convincing.

8.3. Darwinism as a Worldview

The Darwinian Episteme

Intelligent Design's third line of argument against the reconciliation of Darwinism and theism comes from the way that Darwinian evolution is often presented as a whole worldview and a way of thought, not just a scientific theory. As Johnson puts it, Darwinism is an "*episteme, a way of thinking about things in general.*"⁹⁴⁹ Johnson agrees that the new atheists Dawkins and Dennett have presented the philosophical implications of evolutionary biology correctly – it is an universal acid that dissolves everything else "*into shifting sand by the acid of reductionism*".⁹⁵⁰ Thus evolution, when correctly understood, is not just a biological theory, but the starting point for understanding all of reality. Because of this, while a theistic evolutionist might have completely "*orthodox biology*", he or she will still be "*missing the point of the theory*" if he ignores the episteme. This type of separation between evolution as a worldview and evolution as a scientific theory is "*barely possible*", but it is a continual struggle and a source of cognitive dissonance for the theistic evolutionist.⁹⁵¹ According to Johnson, combining the Darwinian way of thought and the naturalistic way of thought "*has a fatal logical weakness that stems from the fact that it attempts to reconcile two fundamentally inconsistent ways of thinking. Theism asserts that God rules everything; naturalism asserts that nature proceeds on its own, without supernatural influence.*"⁹⁵²

Initially, this seems like a challenging argument to make. Many scientists, theologians and philosophers have distinguished between Darwinian evolutionary theory and materialistic thought. Shouldn't it be possible to accept Darwinian evolution as a probable

⁹⁴⁹ Johnson 2010, 49.

⁹⁵⁰ Johnson 2010, 55.

⁹⁵¹ Johnson 2010, 53.

⁹⁵² Johnson 2001, 447.

biological theory and yet not accept the Darwinian episteme? It seems that some positive philosophical arguments should be given before we are justified in selecting a particular scientific theory as our starting point for interpreting all other areas of life. Could we not rather interpret evolutionary biology's meaning for our life based on what we know through other means, such as through our everyday experience, our philosophy, and our religion? It seems difficult to base any whole way of thought on just scientific discoveries. This would require scientism, which is itself a highly questionable philosophical idea that theistic evolutionists can criticize with full justification. As Ted Peters and Martinez Hewlett argue, theistic evolutionists believe that it is possible to separate the gold of evolutionary science from the dross of ideological wrappings.⁹⁵³ Johnson's argument ignores this possibility.

In the previous chapters, I have showed that many defenders of naturalistic evolutionism indeed base their position on philosophical reasons, not just the scientific evidence. As John Haught has also noted, Johnson is correct that for many Darwinians, the theory is more like a worldview than just a scientific theory. It is possible to quote many important evolutionary biologists who draw very far-reaching consequences from the theory. Johnson is right in calling attention to the importance of critiquing this highly influential worldview.⁹⁵⁴ However, as Haught also notes, there are also well qualified biologists and philosophers who do not believe that the ramifications of Darwinian evolutionary theory are this far-reaching. Of course, it could be that those who make a theistic interpretation of Darwinian theory are simply mistaken. However, it could also be that the differences could simply lie in the different worldviews through which theists and materialists interpret evolutionary theory.⁹⁵⁵ It seems difficult to settle the disagreements about the implications of evolutionary theory simply by polling evolutionary biologists and asking them whether Darwinism has metaphysical implications, as Johnson's references to famous evolutionary biologists seem to assume. The question of implications is a philosophical one, and the arguments for and against any such understanding of evolutionary theory must be evaluated.

Separating Evolutionary Biology and Darwinistic Philosophy

In response to Johnson, many have differentiated between *methodological* scientific naturalism and *metaphysical* naturalism.⁹⁵⁶ Metaphysical naturalism is the belief that natural mechanisms and forces are all that exists. According to this understanding, there is no God or higher power and there is no design or purpose in the universe. Methodological naturalism, by contrast, simply means restricting natural science to the study of natural causes. I have gone over varieties of methodological naturalism previously in chapters 3.4. and 3.5. What matters

⁹⁵³ Peters & Hewlett 2003, 22.

⁹⁵⁴ Haught 2003.

⁹⁵⁵ Stenmark 2001.

⁹⁵⁶ Pennock 1999, Murphy 1993.

here is that even under strong methodological naturalism, one could still present reasons for belief in God outside of science. As long as one doesn't accept scientism, such reasons could in principle be seen as compelling.

Johnson's response to the distinction between methodological and metaphysical naturalism has been twofold. First, he has insisted that the main targets of his criticism are those who accept both scientism and methodological naturalism. It would indeed be more rational to understand science as a limited enterprise which cannot prove or disprove the existence of a transcendent Creator. *"To a scientific naturalist, however, 'outside of science' means outside of reality."* Thus the main point of this materialistic scientism is that if there is *"no room for God in science, then there is no room for God in reality."*⁹⁵⁷

Second, Johnson admits that methodologically naturalistic science can be useful, but denies that this is the only possible way of doing science. Here he comes back to the arguments against strong methodological naturalism. If one does not assume metaphysical naturalism, then it is in principle possible that there are gaps in the capabilities of natural processes, and sometimes the activity of God could conceivably be the best explanation for some pattern in nature. Johnson advocates for a methodological pluralism in science, and seeks to create a new kind of science that could in principle recognize gaps and evidence of design in nature.

I have looked at Johnson's view of science in more detail in chapter 3.5. In that chapter, I argued also that even a theistic scientist could in principle accept evolution as the best explanation of biological data. Theistic scientists, as long as they remain scientists, will not be satisfied by explaining every phenomenon by saying simply that "God did it." Rather, they would want to make their explanations as elaborate and satisfying as possible, and would try to find explanations which best fit the evidence.⁹⁵⁸ Because of this, if there is great evidence for the hypothesis of common descent and great evidence of the creative capabilities of the Darwinian mechanism, a theistic scientist would tend to conclude that God used the mechanism of Darwinian evolution to create life, just like the methodological naturalist.

So in the end, Johnson's argument for linking between Darwinian evolutionary theory and the Darwinian episteme comes down to evidential questions. Johnson's argument is that if we do not restrict our inquiry because of methodological naturalism, then the evidence for the Darwinian evolutionary mechanism does not appear at all plausible. Given strong methodological naturalism, even an extremely weak and problematic naturalistic explanation could be the best scientific explanation. According to Johnson, strong methodological naturalism is supporting Darwinian evolutionary biology in just this way. If the assumption of strong methodological naturalism were jettisoned, then scientists would quickly recognize design as the best explanation. Thus if theists have no reason to accept strong methodological naturalism, then theists also have no reason to accept Darwinian

⁹⁵⁷ Johnson & Reynolds 2010, 51.

⁹⁵⁸ Bradley Monton (2009, 62) makes this point well.

evolutionary biology. So, because the empirical evidence is lacking, the main reason a theist would accept Darwinian evolutionary biology is if the theist had unwittingly adopted elements from naturalistic philosophies which are in tension with theism.⁹⁵⁹

The presence of many theistic and apparently honest scientists who believe there is good evidence for Darwinian evolution is a problem for Johnson's argument. For many, it seems that the perception that there is evidence for evolution is the most important reason for believing in evolution than materialistic philosophy. Johnson seems to be correct that for many, acceptance of Darwinian evolution is indeed strongly influenced by philosophical and theological reasons. However, the importance of philosophy does not imply that one could not in principle have overwhelming evidence for Darwinian evolution even if the "Darwinian episteme" were abandoned.⁹⁶⁰ Anyone who accepts the theory because of the evidence and not because of philosophical naturalism can avoid Johnson's argument, since for any such person the naturalistic worldview is not a necessary part of evolutionary theory.⁹⁶¹

8.4. Theistic Evolutionism and Evidence

The Insufficiency of Theistic Evolutionism?

As noted, the ID theorists emphasize the importance of scientific evidence to defend theism against naturalism. This is the foundation of their critique of theistic evolutionism. Earlier, I showed that the ID theorists recognize the possibility that God could have directed the process of evolution, but in a way that is undetectable by the natural sciences and unnecessary for biological theories. This is the type of theistic evolutionism championed by Robert J. Russell, for example.⁹⁶² However, this is seen as unsatisfactory for theists, because it removes evidence that a designer was required to produce life. The ID theorists recognize that is logically possible to separate Darwinism as a way of thought from Darwinism as a scientific theory. However, they believe that this is in practice difficult, because in this situation the theist lacks the necessary evidence to properly defend belief in creation.⁹⁶³

Phillip Johnson argues that the Darwinian way of thought rules out an evidence-based belief in creation, but still leaves room for religion which is chosen for subjective reasons.⁹⁶⁴ Similarly, Dembski writes that "*within theistic evolution, God is a master of stealth who constantly*

⁹⁵⁹ Johnson 1993, chapter 9.

⁹⁶⁰ Ratzsch (2002, 3) makes this point well.

⁹⁶¹ Johnson himself thinks that the evidence is weak: "*Darwinism achieved its present dominance not by experimental confirmation but by confident assertion. There is a fatal flaw not just in the outer districts of the Darwinian metropolis but at the very center, with the mechanism that is relied on to perform all the naturalistic miracles.*" (Johnson and Reynolds 2010, 59.)

⁹⁶² Russell 2008, chapters 4-6.

⁹⁶³ Wiker 2002; West 2007, chapter 10.

⁹⁶⁴ Johnson 1993, 155-7

eludes our best efforts to detect him empirically. Yes, the theistic evolutionist believes that the universe is designed. Yet insofar as there is design in the universe, it is design we recognize strictly through the eyes of faith. Accordingly the physical world in itself provides no evidence that life is designed. For all we can tell, our appearance on planet Earth is an accident."⁹⁶⁵ In this quote, Dembski places a great emphasis on the importance of scientific evidence for design instead of philosophical and religious evidence. This implies that if we accept the Darwinian view, there are no good reasons to believe in the designedness of life's evolution or the universe at large: "*for all we can tell, our appearance on planet Earth is an accident.*"

Dembski also argues that ID is theologically valuable, because it provides evidence against a theory which is indispensable for atheists. For him, claiming that evolution implies atheism is "*logically unsound,*" but it is not unsound to claim that "*atheism implies evolution.*" According to Dembski, atheists require some sort of natural explanation for the design-like complexity of the biological world in order to be "*intellectually satisfied atheists.*" Without evolution, atheists would have to deal with a problematic amount of evidence for the existence of an intelligent designer, giving support to belief in God. Without evolution, atheists would also lack the possibility of justifying their Darwinian metaphysics in a scientific-sounding way. By accepting Darwinian evolutionary theory, theistic evolutionists are thus not using a potent weapon against Darwinism. For Dembski, evolution is a weapon which atheists are using to attack believers. He argues that ID breaks the weapon, while theistic evolutionism provides an ineffectual defence, because it leaves the weapon intact.⁹⁶⁶

Phillip Johnson similarly opposes the "*blind watchmaker*" of Darwinism and divine design. According to Johnson, evolution does leave room for a faraway first cause, a deistic God. However, it doesn't leave room for a God who makes a difference in the natural world and whose existence can be seen from his works: "*If God stayed in that realm beyond the reach of scientific investigation, and allowed an apparently blind materialistic evolutionary process to do all the work of creation, then it would have to be said that God furnished us with a world of excuses for unbelief and idolatry.*"⁹⁶⁷ According to Johnson, the Biblical passages on natural revelation (such as Romans 1:20) show that in the Christian view, nature must point "*directly and unmistakably*" toward the necessity of a Creator. Accepting Darwinian evolutionary theory would mean that natural revelation in biology can no longer be said to be "*direct and unmistakable*". Biologically created things can no longer be said to reveal a Creator, and a crucial piece of evidence for ID has been lost. For Johnson, this makes Darwinian evolution theologically problematic.⁹⁶⁸

⁹⁶⁵ Dembski 1999, 110.

⁹⁶⁶ Dembski and Witt 2008; Dembski 2010; influenced by Dawkins 1991.

⁹⁶⁷ Johnson 2001, 443.

⁹⁶⁸ Johnson 2001.

Intelligent Design and the Seduction of Scientism

This insistence on the extremely high importance of scientific evidence in support of theism is in tension with the ID movement's broader thought, however. Because this insistence is the foundation of the ID theorists' critique of theistic evolutionism, tensions at this point are significant. I will now proceed to consider two aspects of this tension: the tension with the ID movement's own reliance on nonscientific reasons and the tension with the ID movement's desire to critique scientism and defend religious rationality.

The first tension springs from the fact that the ID theorists recognize the existence of many other reasons for believing in God besides biological design arguments. But if such broad reasons are available to the ID theorists themselves, they should also be available to theistic evolutionists. As I pointed out in chapter 3.1, the ID theorists themselves do not believe that their own arguments prove the existence of God or the Christian doctrine on creation. As David Bentley Hart has argued, God as "being, consciousness and bliss" is far more than just an intelligent designer, and the doctrine of creation is also about the radical metaphysical dependence on all that exists on God as the "ground of being" or "being itself", not just about God as the orderer of nature.⁹⁹ Since the ID theorists nevertheless believe (on theological and philosophical grounds) that the designer is God and believe in the doctrine of creation, this means that they must acknowledge the validity on nonscientific reasons for belief despite their insistence on the necessity of scientific evidence.

The ID movement should even acknowledge the rationality of purely intuitive and philosophical belief in a designer of the cosmos. As I argued in chapter 4.1, the ID movement sees the design argument as a defence of an ancient design intuition. However, if humans have found out the truth intuitively or even through philosophical design arguments before the advent of modern science, then this implies that true beliefs in the existence of the designer can arise without science. Since it would be incredible for these beliefs to be correct if they had been formed randomly, ID must also recognize these non-scientific methods and cognitive mechanisms to be reliable. It could of course be that this natural perception of design requires a further elaboration and defence to remain credible in our modern culture. However, it requires further arguments from the ID theorists to show that this defence has to be scientific rather than philosophical. Because of the great theological depth of the doctrine of creation, which I pointed out in chapter 2.5, it seems more credible to think that philosophical and theological defenses of this idea are more important than scientific ones.

As seen in chapter 5, the ID theorists also recognize the possibility of cosmic design arguments, and it is difficult to see why just a naturalistic theory of biological origins would make these impossible in principle. On the ID theorists' understanding it is possible to see that the removal of the biological design argument would weaken the case for design, since it removes one level of design arguments. It also makes it difficult to argue that gaps in the abilities of known natural processes increase the plausibility of the biological design

⁹⁹ Hart 2013, 36-41.

inference. However, it could be argued that more cosmic fine-tuning is required for Darwinian evolution than no Darwinian evolution, and thus the fine-tuning argument arguably becomes stronger as the gaps-based arguments diminish in power. Thus it seems that the wholesale rejection of evidence for design requires more than just a naturalistic theory of biological origins can provide.

Sometimes this is recognized in the ID literature. For example, Benjamin Wiker and Jonathan Witt argue that the cosmic evidence of design is “*Darwin-proof*”, meaning that a theory of biological evolution cannot refute it.⁹⁷⁰ Even Johnson, who believes that the logic behind Darwinian evolutionary theory also leads to the rejection of cosmic design arguments, sees broad reasons for opposing naturalism: “*reality is simply too rational and beautiful ever to be forced into the narrow categories that materialism can comprehend.*”⁹⁷¹ The rationality and beauty of reality in its harmonious natural laws, the possibility of science, the fine-tuning of the universe, the complexity of biological organisms and even the glimpses of something greater in the arts and religious experience all speak of the reality of the “*intelligent designer*” for the ID theorists.⁹⁷²

It seems that the idea of natural revelation as spelled out in Romans 1:20 is a far broader matter than analysed by Johnson. While Johnson relates the passage to the biological design argument, it is noteworthy that the text itself is actually quite ambiguous about the precise way God’s power and wisdom are manifested. Biological and cosmic design arguments are not mentioned. The text is most closely related to the apocryphal *Book of Wisdom* 13:1–9, which is quite different from modern design arguments. For example, consider the very general nature of verses 1–3:

But all men are vain, in whom there is not the knowledge of God: and who by these good things that are seen, could not understand him that is, neither by attending to the works have acknowledged who was the workman: But have imagined either the fire, or the wind, or the swift air, or the circle of the stars, or the great water, or the Sun and Moon, to be the gods that rule the world. With whose beauty, if they, being delighted, took them to be gods: let them know how much the Lord of them is more beautiful than they: for the first author of beauty made all those things.

While biological design does speak of the Creator for many religious thinkers, many also see the immense power and greatness of God in things like the vastness and beauty of the wide blue sky. Psalm 19 says that the heavens testify of God’s greatness, but it does not present a design argument. And many feel that the success of science in understanding the physical processes of creation only increase their amazement at God’s wisdom, rather than diminishing it.⁹⁷³ As I have argued, there are reasons even within ID thought to move towards this type of a deeper conception of creation.

⁹⁷⁰ Wiker and Witt 2006, 238.

⁹⁷¹ Johnson 2000, 152.

⁹⁷² See Moreland, ed. (1994), as well as Dembski & Licona, ed. (2010) for such discussion.

⁹⁷³ Roberts 2003.

The second tension is between the ID movement's emphasis of the importance of scientific evidence and its goal of defending religious rationality and critiquing scientism. Conor Cunningham has argued that ID's project presupposes scientism just as the new atheism does.⁹⁷⁴ However, I find that insofar as ID comes close to scientism in its critique of theistic evolutionism, this is actually in tension with its broader ideas. The ultimate theological purpose of the ID movement is to refute materialistic scientism, not to affirm it. Thus Dembski identifies scientific evidence for ID as the "*bridge between science and theology*,"⁹⁷⁵ presupposing that Christian theology is a rational enterprise. Johnson has termed the ID movement a "*wedge*" which can destroy the pretensions of scientific materialism and open up room for a broader conception of rationality which includes religion and theology.⁹⁷⁶

Johnson's opposition to scientism is sometimes so clear that Robert Pennock actually identifies his views with the postmodernistic critique of science.⁹⁷⁷ Johnson's idea is that if room is made for a designer within science, then the possibility of rationality outside of science also becomes credible. But if there is rationality outside of science, then why the insistence that belief in creation absolutely must have scientific support? These premises that (1) the case for design is broader than biology, and (2) it can be rational to believe something even with nonscientific reasons, would seem to lend themselves also to the justification of a theistic view of evolution.

The ID theorists themselves insist that ID is not scientism. Thus William Dembski⁹⁷⁸ and Jay Richards explain the emphasis on scientific reasons as partly a strategic choice: science has immense cultural authority and far greater public credibility than religion or philosophy.⁹⁷⁹ It is the "*only universally valid form of knowledge in our culture*".⁹⁸⁰ And so to be universally appealing, the ID theorists oppose the atheistic use of science by scientific arguments, rather than philosophy or religion. In challenging the scientific theory of Darwinian evolution, they want to say that their alternative is also scientific so as to present it as a rational and objective, rather than a pseudoscientific view. Their insistence on the necessity of science in influencing popular culture does not mean that they themselves accept science as the only habitat of rationality.

It seems clear to me that the ID theorists do accept the existence of rationality outside of science. However, in the ID theorists' critique of theistic evolutionism this emphasis on the necessity of scientific reasons does not appear merely a strategic choice but takes on larger significance. As I have showed throughout chapter 8, the ID theorists generally argue that theistic evolutionism differs only superficially from naturalistic evolutionism. The philosophical and theological reasons theistic evolutionists present in defence of their

⁹⁷⁴ Cunningham 2010, 278.

⁹⁷⁵ Dembski 1999a.

⁹⁷⁶ Johnson 2000.

⁹⁷⁷ Pennock 2010.

⁹⁷⁸ Dembski 1998c, 26-27.

⁹⁷⁹ Richards 2010, 260-270.

⁹⁸⁰ Dembski 1998, 26- 27.

position are dismissed as unconvincing and unimportant. This is the case even in the ID theorists' evaluations of theistic evolutionists like Denis Lamoureux, who insist that there is much evidence to support theism, though this evidence is not part of the natural sciences. Rather, the ID theorists emphasize that a theistic interpretation of evolution must differ from atheistic evolutionism on the level of the science. At this point, the ID movement's critique indeed gives the impression the movement itself values scientific reasons far above religious and philosophical ones just as our broader culture does. Here the fears of critics like Cunningham seem to be confirmed.

There is a danger in this insistence on primarily scientific reasons in defence of religious belief. From a Christian perspective, the supposition that religious and philosophical reasons for belief have little value is surely a large problem in our culture to be confronted, rather than a reality that needs to be accepted for strategic reasons. Because of the implicit devaluing of philosophical and religious reasons in the critique of theistic evolutionism, the ID movement does seem to be flirting with scientism in this critique. But making science the primary arbiter of religious truths is theologically problematic, because (1) most Christian doctrines cannot be demonstrated within the narrow confines of what scientism counts as rational, (2) religious rationality is in actual practice based on much broader grounds, and (3) the doctrines of God and creation are about much more than just design, as the ID movement itself acknowledges. Thus accepting scientism as the criterion of rationality would make typical Christian religious beliefs irrational. Because the ID movement wants to defend traditional Christianity, it should emphasize the existence of good philosophical and religious reasons for belief in design and creation, rather than insisting that theistic evolutionists must provide scientific evidence before their views can be substantially different from those of atheistic evolutionists.

Dembski's argument that ID is required to counter the atheists' use of evolutionary science as an argument against religious belief is problematic for related reasons. Both the ID theorists and theistic evolutionists recognize that the "Darwinism" used as a weapon is not just a scientific theory, but also a metaphysical worldview. But if this is true, then the weapon also has a philosophical component, and is not composed just of science. It follows that philosophical arguments can and must be used to dismantle the weapon. Again, powerful philosophical arguments against materialistic scientism indeed exist, so it is difficult to see why the ID theorists seem in many comments to see ID as the only durable answer to this use of Darwinism.

Though ID's critique of theistic evolutionism is highly problematic, this is not a fatal problem for the ID movement. The ID movement could abandon its critique of theistic evolutionism in general and turn away from the seduction of scientism without abandoning any part of the design arguments that are at the core of the movement's thought. The movement could also continue to insist that scientific evidence in support of belief in creation is valuable, and simultaneously acknowledge that belief in creation does not depend on the failure of Darwinism or the existence of scientific arguments in its favour. Giving up the critiques of TE analysed in this chapter also will not mean that the ID theorists will have to give up all of their critique of individual arguments for theistic evolutionism, or that the movement could not fall back on traditionalistic biblical critiques of evolutionary theory,

such as the insistence on the importance of a historical Adam and a historical Fall.⁹⁸¹ They could also continue to insist that theistic evolution is not theologically required by a proper understanding of the doctrine of creation or for answering the problem of natural evil, which I will analyse in the next chapter.

The acceptance of the in principle possibility of theistic evolutionism would be more in line with ID's "big tent" strategy and its emphasis on the importance of an open evaluation of scientific evidence. This would create a theologically sounder base for ID and would also help eliminate the suspicion of many critics that religious and moral concerns about evolution influence the ID theorists' evaluation of the empirical evidence too much. It would also be in line with the ID theorists' own theological emphasis on the freedom of the Creator, as seen in chapter 3.5.

⁹⁸¹ The historicity of Adam is currently a much-discussed topic, with some theologians insisting that any theologically acceptable evolutionary view must allow for the historicity of Adam, and others arguing that a fully non-historical reading of the paradise narratives is sufficient for theology. If successful, the arguments for the necessity of a historical Adam do not aim to refute all evolutionary views theologically, just a subset of evolutionary views. For discussion, see Caneday, Barrett & Gundry (ed) 2013.

9. DESIGN ARGUMENTS AND NATURAL EVIL

The problem of naturalistic evil has been used in both naturalistic and theistic critiques of the ID movement's design arguments. It is argued that the existence of natural evil and the problem of bad design are difficult to explain on ID's understanding of the designer. Rather, a model of naturalistic or theistic evolutionism can account for the existence of natural evil much better. This chapter will situate the problem in the broader context of natural theology and analyse the responses of the ID movement. Often, the problem of natural evil is discussed in the ID discussion without taking into account the broader philosophical and theological context. To avoid this problem, I will begin with some basic formulations of the problem and common responses to it in chapter 9.1. I will then go on to analyse the ID movement's responses to the problem in chapter 9.2. Chapter 9.3 presents theological discussion of the problem in relation to ID.

9.1. The Basics of the Problem of Natural Evil

Understanding the Problem

In Hume's *Dialogues Concerning Natural Religion*, the problem of natural evil is one of the core objections against all forms of natural theology, including design arguments:

Look round this universe. What an immense profusion of beings, animated and organized, sensible and active! You admire this prodigious variety and fecundity. But inspect a little more narrowly these living existences, the only beings worth regarding. How hostile and destructive to each other! How insufficient all of them for their own happiness! How contemptible or odious to the spectator! The whole presents nothing but the idea of a blind nature, impregnated by a great vivifying principle, and pouring forth from her lap, without discernment or parental care, her maimed and abortive children.⁹⁸²

The *Dialogues* presents four types of natural evil: (1) the capacity of organisms for pain, not just pleasure; (2) the governance of the world through regularities and natural laws, rather than through divine action that could prevent any evil; (3) the insufficient natural capabilities granted to living beings for taking care of themselves and finding happiness; and (4) the insufficient fine-tuning of the natural laws, which do allow for life, but also for natural disasters. The universe is compared to a poorly built house where the tenants live in suffering. The *Dialogues* then goes on to argue that this presents a problem for belief in God,

⁹⁸² *Dialogues*, part XI. (Hume 1999, 113.)

because we would not expect to find this type of evil in a world created by an omnipotent, morally perfect Creator.⁹⁸³

In the philosophy of religion, there has been much discussion over how the problem of natural evil should be formulated. It is customary to differentiate the logical and the evidential forms of the problem of evil.⁹⁸⁴ The logical problem can be formulated succinctly as follows:

1. If God exists, then evil cannot exist.
2. Evil exists.
3. Therefore, God does not exist.⁹⁸⁵

The logical problem of evil asserts that there is a logical incompatibility between the existence of an omnipotent, morally perfect Creator and the existence of evil. However, this is not the form of the problem that is used in the *Dialogues*, for the reason that because of the limits of human knowledge, it is always possible to argue that a morally perfect Creator may have some unknown reason for allowing evil in his world. Since the publication of Alvin Plantinga's *God, Freedom and Evil* (1974), most philosophers of religion have come to agree that the existence of evil is logically compatible with the existence of God.⁹⁸⁶ However, Hume's argument does not stop here:

I will allow, that pain or misery in man is compatible with infinite power and goodness in the Deity, even in your sense of these attributes: What are you advanced by all these concessions? A mere possible compatibility is not sufficient. You must prove these pure, unmixed and uncontrollable attributes from the present mixed and confused phenomena, and from these alone.⁹⁸⁷

In the *Dialogues*, the problem of natural evil is not used so much to disprove the existence of the Creator as to argue against the possibility of proving the Creator's goodness. On this understanding, the imperfection of creation is in contradiction with the perfection of God, and so it cannot function as evidence for God's perfect goodness. This evidential argument from evil is based on a comparison of hypotheses: does an indifferent and impersonal mother nature "*impregnated with a great vivifying principle*" that works "*without discernment or parental care*" provide a better explanation of the facts than the hypothesis of a morally perfect, omnipotent Creator? Proponents of the evidential problem argue that the evidence

⁹⁸³ *Dialogues*, part XI. (Hume 1999)

⁹⁸⁴ Murray 2011, chapter 1; Tooley 2013.

⁹⁸⁵ Draper 2009, 334.

⁹⁸⁶ Plantinga 1977 [1974]; for some discussion on the impact of the argument and a dissenting opinion, see Oppy 2006, 262-263. Trent Dougherty (2014, chapter 2) argues that the distinction between the logical and evidential problem collapses in light of how deductive arguments actually work. Deductive arguments also don't assume that we have full certainty of their premises before they can lend some credibility to the conclusion. Rather, to the degree that we have confidence in the premises, we should also have confidence in the conclusion.

⁹⁸⁷ *Dialogues*, part XI. (Hume 1999)

of natural evil is better explained by the hypothesis that we are produced without divine design, than the hypothesis of design.

The evidential problem argues that though the existence of a morally perfect, omnipotent God is logically compatible with the existence of evil in the world, evil is nevertheless evidence against the existence of such a God. It is simply implausible that a good God would create a world like ours, it is argued. Given the hypothesis that such a God exists, then according to the argument we would not expect to see the level of evil in the world that we do see. This refers to both the quality and the quantity of evil: horrendous and gratuitous evils of types that it is difficult to conceive any good purpose for, great quantities of evil when only a small amount might be expected and so on. On this view, then, the existence of evil in our world provides counterevidence against the hypothesis that God exists.⁹⁸⁸

In the modern discussion, this evidential argument has been championed by Paul Draper, and applied to the discussion on design arguments by Jan Narveson and Gregory Dawes among others. The argument is that theistic arguments get any explanatory power they have from their appeal to the goodness of God, which allows us to make some hypotheses about what God would act. We can assume, for example, that a good God would create a rational cosmos, that he would care about the existence of intelligent life and so on. However, if God is so unknowable that we cannot suppose that he would act to minimize suffering in the world (and eliminate any evil) then we also cannot suppose that he would create rational laws, and so the theistic arguments lose their explanatory power.⁹⁸⁹

A Variety of Responses to the Problem

To better situate the answers given by the ID movement, I will first briefly describe eleven typical strategies for answering the problem of natural evil in the literature.⁹⁹⁰ The first four strategies (1-4) follow the idea of questioning our ability to evaluate the goodness of the world and to judge that God should have eliminated all evil, or at least claim that the amount of evil in the world may be less than we think. The following four (5-8) present different possible reasons that may justify allowing the existence of evil. The next two strategies (9-10) are based on re-evaluating the evidence, and arguing that the evidence for God's existence outweighs the evidence against it. The final strategy (11) involves giving up

⁹⁸⁸ Howard-Snyder (ed.) 1996; see also Draper & Dougherty 2014 for further discussion.

⁹⁸⁹ Narveson 2003, Dawes 2009.

⁹⁹⁰ Following Plantinga's (1974) terminology, attempts to show that the existence of evil and the existence of God are logically compatible are commonly termed *defences*, while attempts to show that the God actually has good reasons to permit evil (and that hence the existence of evil is not improbable on theism) are commonly called *theodicies*. See also Murray 2009b, 353. Dougherty (2014, 51-53) criticizes the usefulness of this distinction.

some of the traditional divine attributes, such as omnipotence. Different strategies are also often combined in order to provide a more robust response to the problem.⁹⁹¹

First (1), it is possible to argue that we cannot reliably predict that God would not create a world like ours, since we cannot be confident in our ability to judge such lofty things as the character and motives of God. Because of this, we cannot assert with any confidence that the existence of evil is incompatible with the existence of God. The basic intuition behind this strategy finds support in the tradition of negative theology, as well as the Biblical book of Job. However, if God is asserted to be fully unknowable, this includes very high costs for the rest of Christian theology. It also becomes difficult to speak of God's love for humanity, since we will have no basis of saying what such love means.⁹⁹²

However, perhaps God could be unknowable in some weaker sense of the term. Perhaps there is some way appealing to the complexity of reality and the limits of human knowledge that strikes just the right balance between allowing for knowledge of God on the one hand, but nevertheless being skeptical of our ability to criticize God. Actually, perhaps it is precisely in knowing God that we also realize that he is beyond our ability to criticize. As I pointed out in chapter 2.5, traditionally theological language indeed includes both the cataphatic and the apophatic element. Assertions of the unknowability of God must paradoxically always be based on some knowledge of what God is like before they can be meaningful.⁹⁹³

Second (2), it is possible to direct our skepticism to our knowledge of the world, instead of at our knowledge of God's nature. Modal skepticism means the argument that we cannot make informed judgments about how the world should be. The mystery of evil is not so much in God's character as in the complexity of the world which makes it difficult for us to argue that the world is not optimally designed. We cannot argue that God should have made the world in some other way, because making such a judgment requires far more knowledge than we are capable of acquiring.⁹⁹⁴

One problem with this strategy is that a strong modal skepticism seems to lead to skeptical theism. If we cannot know anything about the possibilities available to a divine agent or judge whether the world is good or not, we also cannot know what sort of actions a good God would make, and thus his goodness becomes completely unknowable to us.⁹⁹⁵ However, a weaker form of modal skepticism may still be useful in conjunction with some other strategies. For example, Gregory Boyd uses it to argue that though we can explain the existence of evil in general, the explanation of particular evils is difficult: *"the problem of*

⁹⁹¹ Murray 2011, chapter 7.

⁹⁹² For much discussion of skeptical theism, see Dougherty & McBrayer 2014.

⁹⁹³ John DePoe (2014) has recently defended just this type of formulation of skeptical theism. There are other ways of arguing for the simultaneous knowability and unknowability of God. For example, Luther's theology of the cross asserts that God appears in his opposite, as when Christ suffering on the Cross is actually the ultimate expression of God's love. There have been some attempts to apply the ideas of the theology of the cross to natural history, as well. (E.g. Murphy 2008). See also McGrath 2003, 204-210.

⁹⁹⁴ Van Inwagen 1998.

⁹⁹⁵ Dawes 2009, 94-96.

explaining why a particular “natural evil” occurred is in actuality no different than the problem of explaining why any particular thing occurs. – – [the explanation of particular instances of evil is] simply the mystery of creation’s complexity.”⁹⁹⁶

Both skeptical theism and modal skepticism have one major problem in common: they only provide an answer to the logical formulation of evil, not the evidential formulation. They can at most make it possible to argue that we do not have grounds to expect that God would eliminate all evil from the world. This means that it remains possible to argue that the amount and type of evil in the world nevertheless fits better with the atheistic understanding of the world. If one thinks (based on one’s own theological approach) that engaging in natural theology is important, further arguments are required.⁹⁹⁷ The next three strategies argue that we can actually know at least good reasons that justify allowing the existence in the world, and so reduce the improbability of evil on the theistic understanding. A milder form of skepticism is to deny simply the validity of examples of natural evil.

The third (3) strategy is to deny the existence of the “best possible world.” This argument denies the possibility of creating a world that is truly optimal in sense that it is the best of all possible worlds. For example, it could be that some good things rule each other out, so that all good things cannot be realized in the same world. It also seems to be the case that we can always imagine that the world would be a little bit better: simply add more happy and virtuous person. The impossibility of the best possible world can then be used to argue that we should not expect God to create a world that is as good as we can imagine in all ways. Rather, God could be expected to create just a very good world.⁹⁹⁸ It seems to me that this defence can be successfully used to show that some purported instances of natural evil are not really evil. This includes things like the scarcity of habitable planets in the solar system. One could always ask for more. However, the strategy is not applicable to all examples. Unless we also embrace modal skepticism, it seems possible to argue that the world indeed could be a better world in some respect without losing some other good.⁹⁹⁹

Fourth (4), other examples of natural evil can also be argued to be actually useful or morally neutral on closer examination. For example, some neo-cartesians argue that animal experience of suffering is either nonexistent or very different from our own, and thus cannot be considered as evil as our own suffering. This strategy is problematic, since common sense and the consensus of scientists both agree that animal pain is analogous to ours, despite differences in neuroanatomy. It is plausible that higher animals do suffer in some way. Nevertheless, perhaps this strategy can be used to argue that at least some examples of natural evil are not as evil as one might initially think.¹⁰⁰⁰ In chapter 9.2, I will show how the

⁹⁹⁶ Boyd 2001, 309. Furthermore, some grounds to hesitate before evaluating God based merely on our current understanding of the world seems to be implied by Christian eschatology: we have not yet seen what the world will be like at the end of history, and it has been promised that God will make all things right. (Hart 2005, chapter 2).

⁹⁹⁷ Dougherty 2014, chapter 2.

⁹⁹⁸ Morris 1993.

⁹⁹⁹ Dawes 2009, 92-94.

¹⁰⁰⁰ See Murray 2011, chapter two and Dougherty 2014, chapters 4 and 5.

ID theorists also argue that some examples of natural evil and bad design cannot actually be demonstrated as evil or bad. I move now to strategies which attempt to show why God could be justified in allowing evil.

Fifth (5), it has been argued that allowing the suffering we see is justified, because it will lead to greater good. These theodicies assert that features though to be evil are in actuality not evil, but part of a good plan that we can at least partly understand. Soul-making theodicies are an important example of this idea. It is argued that the world is created as an arena of growing and exercising virtues, and that this would be impossible without the suffering caused by natural evil.¹⁰⁰¹ One problem with this view is that suffering does not always seem to lead to the growth of character. Related to greater good theodicies in general, we can also ask whether some instances of suffering are too horrible to be justified by any such good purpose. It sometimes seems implausible than an omnipotent God could not have found any better way for fulfilling his purposes. Nevertheless, the idea that suffering will ultimately be redeemed is an important part of the Christian tradition.¹⁰⁰²

Sixth (6), it is often argued that the possibility of suffering is a consequence of allowing the great good of free will. It is claimed that the existence of true creaturely freedom is such a great good that its existence justifies allowing the existence of evil resulting from free choices by the creatures.¹⁰⁰³ Typically free will defences have been used to explain the existence of evil in human societies after the “fall” of humanity. Since the discovery that suffering existed before humans, this has become more difficult, though some still argue that God created nature to be a fitting place for sinful humans, since he had foreknowledge that humans would sin.¹⁰⁰⁴ However, free will defences have also been used to explain the existence of natural evil by reference to the pre-human cosmic fall of angels.¹⁰⁰⁵ This introduces more complexity to theistic natural theology in order to account for the data of evil, and its credibility is dependent on our metaphysics and view of free will.¹⁰⁰⁶

Seventh (7), nomic regularity-defences and free process defences argue that the existence of regularity in the world is a great good. This defence is typically related to the free will defence: in order for the free-willed creatures to be able to interact with each other, the order of nature must be comprehensible and reliable. But if God intervenes every time something evil is about to happen, then the creatures will no longer be really free. Furthermore, disturbing the regularity of the cosmos with too many miraculous interventions would also lead to the demise of creaturely responsibility. So, the law of gravity must typically remain in force, even if it results in accidental deaths by falling from tall places.¹⁰⁰⁷ Free process defences further argue that any order of nature that allows for free

¹⁰⁰¹ E.g. Hick 1978; similarly Peterson 1982, 113, Stump 2010. See Dougherty 2014 for an application of the soul-making theodicy to animals.

¹⁰⁰² Hart 2005.

¹⁰⁰³ Plantinga 1977.

¹⁰⁰⁴ E.g. Dembski 2009.

¹⁰⁰⁵ Boyd 2001, chapters 8-10.

¹⁰⁰⁶ Murray 2011, chapter 3.

¹⁰⁰⁷ Swinburne 1998; van Inwagen 1991; 2008.

interaction must also allow for natural processes to degenerate into chaos and violence, because only then can these processes be manipulated for novel ends by free agents.¹⁰⁰⁸

Eighth, (8) Chaos to order-defences are closely related to the nomic regularity defence. The argument in these defences (sometimes also known as evolutionary theodicies) is that employing a free process of evolution in the work of creation is a good thing, even if this process also leads to the evolution of natural evil and suffering. For example, it has been argued that this type of free process is required in order for the creation to be truly independent of its Creator and that a nature possessing such creative capacities is in some way more beautiful or better than a nature without such capacities. Like free will defences, these defences seek to absolve God of the responsibility for evil in nature. Here the culpable party is a natural unconscious and blind process rather than an intelligent moral being, however. I will analyse these defenses in more detail in chapter 9.3.¹⁰⁰⁹

One problem with the nomic regularity defence and the chaos to order-defence is that it seems to be possible to imagine a regular, evolving world that allows for free interaction between agents, but does not contain quite as much evil. For example, it seems that the world could contain less hurricanes and earthquakes, yet remain highly regular. Furthermore, some amount of divine intervention to minimize chaos would surely be possible without endangering the freedom of creatures. So, one can continue to ask why God has not created a better world. If massive irregularity is considered to be a fault in a world, this defence does help understand why God would create a regular world and not intervene to prevent all evil. The type and amount of evil may still remain unexplained, however.¹⁰¹⁰

The following two strategies attempt to situate the problem of natural evil in a broader context of theistic arguments, and to re-evaluate the extent of natural evil in the world. As noted, natural theology does not seek to merely demonstrate the logical compatibility of theism and evil, but claims that the evidence is on the whole in favour of belief in God.

The ninth strategy (9) is the evidentialist response to the problem of natural evil. Even granting that natural evil provides some evidence against the existence of a good God, it may nevertheless not provide enough counterevidence to override the power of the positive arguments for the existence of God. The approach of Richard Swinburne, for example, is to minimize the power of the argument from evil by using theodicies and then to argue that the overall evidence is sufficient to render theism more probable than not.¹⁰¹¹ William Paley's response to Hume's argument in his *Natural Theology* was similar: Paley argued that there is much more good than evil in the world, and that we can often identify a good reason for the existence of purported natural evils.¹⁰¹² In this approach it may be admitted that at least some

¹⁰⁰⁸ Meister 2013.

¹⁰⁰⁹ Van Till 2001.

¹⁰¹⁰ Murray 2011, chapter 5.

¹⁰¹¹ Swinburne 2004a, chapter 11.

¹⁰¹² *Natural Theology*, chapter XXVI. (Paley 2006, 237-276). Hume anticipated this type of response in the *Dialogues* and argued that the majority of religious thinkers have also emphasized the miseries of life prior to the discussion about the problem of evil. (*Dialogues*, part XI, Hume 1999).

natural evils are evidence against theism, but these are seen as anomalies in the broader pattern of evidence which supports theism. However, as in the natural sciences, anomalies do not always lead automatically to the rejection of an otherwise good theory.¹⁰¹³ The credibility of this approach depends on how strong we think the grounds of theistic belief are in contrast with the problem of evil.¹⁰¹⁴

The tenth strategy (10) is closely related to the evidentialist argument, but taking the case even further. It is argued that the existence of natural and moral evil is actually evidence in favour of the existence of God, rather than against it. The argument is that naturalism implies that good and evil are merely human inventions, whereas theism implies that there is an objective standard of moral good and evil. Evil is understood as parasitic on good. Thus God as the highest good must also exist if evil exists. This approach has also been endorsed by prominent thinkers within the ID movement, notably William Dembski¹⁰¹⁵, Benjamin Wiker¹⁰¹⁶ and Cornelius Hunter.¹⁰¹⁷ Dembski puts this point as follows: *"The line I find most convincing is that evil always parasitizes good. Indeed, all our words for evil presuppose a good that has been perverted. Impurity presupposes purity, unrighteousness presupposes righteousness, deviation presupposes a way (i.e., a via) from which we've departed, sin (the Greek hamartia) presupposes a target that was missed, etc. Boethius put it this way in his Consolation of Philosophy: 'If God exists whence evil; but whence good if God does not exist?'"*¹⁰¹⁸ This moral argument for theism based on natural evil argument is related to the controversial moral argument for God's existence; there is much discussion and the objections to both arguments will be similar.¹⁰¹⁹

The eleventh strategy (11) involves moving away from the traditional understanding of the divine nature. Even if evil were logically inconsistent with the existence of God, the problem could be averted by adopting some form of belief in God which denies classical conception of the omnipotence of God. In the modern discussion, process theology is a major conception of this kind. It is argued that God does not actually create the world from nothing, and acts in the cosmos only through loving persuasion. This means that God does not actually have the power to eliminate all evil, though his loving persuasion will ultimately lead the cosmos towards goodness.¹⁰²⁰

Because the problem of natural evil is an important naturalistic counter-argument to both cosmic and biological design arguments, one might think that different opinions about

¹⁰¹³ For a defense of thinking of evil as an anomaly for theism akin to the anomalies of scientific theories, see Dougherty & Pruss 2014.

¹⁰¹⁴ See also Murray 2011, chapter 4 for some more refined criticisms of approaches arguing that the good outweighs the bad in our world. When considered in the context of specifically Christian theology, religious experience can also be argued to create a trust in God's love. However, this response relies on knowing about God's love through faith, not through natural theology.

¹⁰¹⁵ Dembski 2000a.

¹⁰¹⁶ Wiker 2009.

¹⁰¹⁷ Hunter 2010.

¹⁰¹⁸ Dembski 2000a, quoting Boethius 1973, 153.

¹⁰¹⁹ For example, see the excellent discussion in King & Garcia (ed.) 2009.

¹⁰²⁰ For different perspectives on process theology, see Cobb & Griffin 1976 and Nash (ed.) 1987.

design are influenced by whether one chooses to focus on natural good or natural evil. Theists could then be understood as optimists who see natural good as the more important evidence, and naturalists as pessimists who focus on natural evil. However, I think that this interpretation would be mistaken. Naturalists, too, typically emphasize the beauty of the natural order and the goodness of life. For example, Richard Dawkins' writings on evolution are full of wonder at the order of nature, even while arguing that nature contains bad design.¹⁰²¹ The same contrast is already present in Darwin's thought. On the one hand, Darwin felt that there was "grandeur" in his view of life and obviously felt love, rather than disgust, for the natural world.¹⁰²² On the other hand, he thought that natural evil was a problem for theism, writing that "I cannot persuade myself that a beneficent and omnipotent God would have designedly created the *Ichneumonidae* with the express intention of their feeding within the living bodies of caterpillars or that a cat should play with mice."¹⁰²³ It seems that the central difference between proponents and critics of design arguments is not in their degree of pessimism but in the significance they attribute to natural good and natural evil, as well as in the theological conclusions they make.

In the discussion on Intelligent Design, the problem of natural evil has been used in two main ways. First, it has been used in largely the same way as Hume used the problem: as a philosophical problem for any attempt to argue that biological nature is designed, rather than produced by a natural process that is "without discernment or parental care."¹⁰²⁴ This type of critique typically involves empirical evidence about non-optimal (stupidly designed, rather than intelligently designed) structures in nature or even evil designs in nature.¹⁰²⁵ Second, the problem of natural evil has also been presented as a theological argument against ID. It is argued that ID makes it difficult to use an evolutionary chaos to order-defence in response to the problem of natural evil. Because of this, it is argued that ID makes Creator responsible for all the natural evil in world and is therefore a theologically dangerous or even blasphemous idea, which should be rejected in favour of theistic evolutionism.

Thinkers within the ID movement have endorsed a variety of the ten responses listed above. However, the primary response of the ID movement to the problem of natural evil is something quite different. Rather than engage in a theological and philosophical response to the problem of natural evil, the ID movement insists that the problem is theological in nature, and is not actually relevant for assessing its scientific design arguments.

¹⁰²¹ See e.g. Dawkins 1991 & Dawkins 2009.

¹⁰²² Darwin 2009 [1859], 360.

¹⁰²³ Darwin 2012 [1860]. Desmond and Moore (1991, 622-637) argue Darwin evolved in his religious views from a theist into an agnostic. Even as an agnostic he wavered between belief and unbelief.

¹⁰²⁴ *Dialogues*, part XI. (Hume 1999, 113).

¹⁰²⁵ Sometimes the problem is called the problem of bad design rather than natural evil. However, in my view, bad design is a subset of the problem of natural evil, and the logic of the arguments is the same, so my usage of the term "problem of natural evil" covers the problem of bad design.

9.2. Intelligent Design and Bad Design

Bypassing the Problem?

In chapters 3 and 4, I showed that the ID movement's design argument does not identify the designer as God. Rather, its design arguments are based on the idea that certain types of order in nature are best explained as the creation of an intelligent designer. Because of these characteristics of their design arguments, the ID theorists argue that their design argument bypasses the philosophical and theological discussion of the problem of natural evil. Thus Dembski, for example, argues that:

Critics who invoke the problem of evil against design have left science behind and entered the waters of philosophy and theology. A torture chamber replete with implements of torture is designed, and the evil of its designer does nothing to undercut the torture chamber's design. The existence of design is distinct from the morality, aesthetics, goodness, optimality, or perfection of design. Moreover, there are reliable indicators of design that work irrespective of whether design includes these additional features.¹⁰²⁶

So, generally the ID movement argues that its design hypothesis does not say anything about the moral characteristics of the designer. Behe similarly claims that "*we can determine that a system was designed by examining the system itself, and we can hold the conviction of design much more strongly than a conviction about the identity of the designer.*"¹⁰²⁷ So, the design argument cannot say "*whether the designer of life was a dope, a demon or a deity*", and we need not deny the conclusion of design simply because the design appears evil to us.¹⁰²⁸ Behe himself is quite consistent on this point, even arguing that malaria was intentionally designed. Because of the parasite's molecular machinery is an "*exquisitely purposeful arrangement of parts*", it is not, for Behe, credible to believe that it evolved without the direction of some intelligent designer.¹⁰²⁹

It is quite easy to argue based on our common human experience that we can indeed recognize something as designed, even if we can ourselves come up with ways to improve on the design. For example, Windows 95 was in fact designed, even though it has been possible to improve on the operating system in following editions. The torture chamber described by Dembski can similarly be recognized as designed, even though designing such a chamber is an evil act.¹⁰³⁰ In chapter 4, I argued that the ID movement's design arguments don't primarily depend on assessments of the designer's morality and motives. Rather, they depend on the perceived link between some types of order and intelligent design as a cause. Based on this, the ID movement's response to the problem of natural evil does have some

¹⁰²⁶ Dembski 2000a.

¹⁰²⁷ Behe 2006a, 196.

¹⁰²⁸ Behe 2007, 238-239.

¹⁰²⁹ Behe 2007, 237.

¹⁰³⁰ Similarly Collins 2005, 186-187.

initial plausibility. As long as design hypothesis is highly minimalistic, the consideration of the moral nature of the design does not factor into the main argument.

But does the ID theorists' response indeed succeed in bypassing the problem of natural evil? I see four reasons for thinking that the problem of natural evil is relevant for the discussion of ID's design argument.

First (1), in previous chapters, I have shown that the ID theorists sometimes move between a minimalistic and a more robust version of the design hypothesis. Sometimes they do also refer to the beauty, optimality and goodness of nature as additional reasons to believe in the existence of a designer. In cosmology, at least some ID theorists refer to the beauty, goodness and rationality of the cosmos as evidence that fits better with the hypothesis of intelligent design than with any naturalistic explanation. In biology, the ID theorists' writings similarly show awe in the face of the designed elegance of biological systems. Dembski himself argued already in 1998 that "*on an evolutionary view we expect a lot of useless DNA. If, on the other hand, organisms are designed, we expect DNA, as much as possible, to exhibit function.*"¹⁰³¹ With the ENCODE project and other recent research now discovering at least some functions in junk DNA, proponents of ID argue that this validates Dembski's prediction.¹⁰³² However, a prediction like this requires a more robust design hypothesis, one in which the designer is highly intelligent.

So, in practice, the ID theorists do seem to use more robust versions of the design hypothesis when they feel that it fits the evidence. However, it seems inconsistent to use a more robust design hypothesis when it fits the evidence, but then retreat back to a minimalistic design hypothesis when faced with criticism.

Second (2), proponents of ID must face the problem of natural evil because it is presented merely as evidence against design, but also as evidence that is predicted by naturalism. In the context of biological design arguments and naturalistic evolution, Jerry Coyne puts the point as follows:

Insofar as intelligent-design theory can be tested scientifically, it has been falsified. Organisms simply do not look as if they had been intelligently designed. Would an intelligent designer create millions of species and then make them go extinct, only to replace them with other species, repeating this process over and over again? Would an intelligent designer produce animals having a mixture of mammalian and reptilian traits, at exactly the time when reptiles are thought to have been evolving into mammals? Why did the designer give tiny, non-functional wings to kiwi birds? Or useless eyes to cave animals? Or a transitory coat of hair to a human fetus? Or an appendix, an injurious organ that just happens to resemble a vestigial version of a digestive pouch in related organisms? Why would the designer give us a pathway for making vitamin C, but then destroy it by disabling one of its enzymes? – – There are only two answers to these

¹⁰³¹ Dembski 1998d, 26; quoted in Meyer 2013, 401.

¹⁰³² Meyer 2013, 400-402. See also Wells 2011 for the ID movement's most thorough case against the concept of "junk DNA". The main study referenced by Meyer on the demise of the idea of junk DNA is ENCODE Project Consortium 2012. For an argument that the ENCODE Project has interpreted its results erroneously and that it is still reasonable to say that most of the human genome is filled with nonfunctional junk DNA, see Doolittle 2013.

questions: either life resulted not from intelligent design, but from evolution; or the intelligent designer is a cosmic prankster who designed everything to make it look as though it had evolved. Few people, religious or otherwise, will find the second alternative palatable. It is the modern version of the old argument that God put fossils in the rocks to test our faith.¹⁰³³

Other writers promoting similar arguments are not difficult to find. A classic statement is provided by Stephen Jay Gould, who argues in his book *The Panda's Thumb* (1980) that “if God had designed a beautiful machine to reflect his wisdom and power, surely he would not have used a collection of parts generally fashioned for other purposes.... Odd arrangements and funny solutions are the proof of evolution--paths that a sensible God would never tread but that a natural process, constrained by history, follows perforce.”¹⁰³⁴

Here the argument for evolution clearly has its theological and philosophical part, as some in the ID movement have argued.¹⁰³⁵ These writers have some expectations about what we could reasonable expect an intelligent designer to do. But the argument is not just that these features are evidence against intelligent design. Rather, they are also presented as positive evidence in favour of naturalism. If we have reason to expect these types of findings on the hypothesis of naturalistic evolution, but no reason to expect them or their absence on the hypothesis of intelligent design, then the evidence of bad design favours naturalistic evolution over intelligent design.

Evolutionary biologists have identified four reasons for expecting that Darwinian evolution would not create perfect creatures. First, selection can act only on existing variations. If a mutation making some trait possible does not occur, then it won't evolve. Second, evolution is limited by historical constraints. Adaptation to new situations must begin from the body plan that already exists, rather than designing a new one from scratch. Third, adaptations are often compromises. For example, it may be difficult to simultaneously create a high amount of offspring and care for them all. Fourth, chance, natural selection and the environment interact. An adaptation that is good for one environment may not be as optimal when the environment changes.¹⁰³⁶

As I have shown in chapter 6, ID does in principle allow for combining belief in design and parts of evolutionary theory. The designer can also work through a historically constrained process, leading to the same limitations in designs. The combination of ID and evolution can also lead ID theorists to expect life to be imperfect in the way described by Coyne and Gould. This possibility to combine ID and evolution is another way to bypass the evidence for bad design as irrelevant for ID's design arguments. On this understanding, bad designs will simply be evidence for an evolutionary understanding of design, rather than against all design arguments. However, this strategy for bypassing part of the problem will

¹⁰³³ Coyne 2005, part VI.

¹⁰³⁴ Gould 1980, 20-21.

¹⁰³⁵ For example, see Hunter 2001 and Nelson 1996.

¹⁰³⁶ Campbell & Reece 2007, 484.

only work for that minority of ID theorists who accept common descent. Others need to find further responses.

The nature of adaptations as compromises and the difficulty of creating adaptations that are good in all environments can also be transformed into defenses of the design argument. Dembski argues that design can also “*conditioned by the needs of a situation and therefore always falls short of some idealized global optimum.*”¹⁰³⁷ Chris Doran has argued that this requires a strong analogy between human designers and the intelligent designer of life, and goes against the doctrine of the omnipotence of God. Presumably God, creating out of nothing, could in principle create organisms that are in all respects perfect.¹⁰³⁸ However, I think Dembski’s strategy can in principle fit under the strategy of denying the possibility of the best possible world which I described in chapter 9.1. Under this understanding, even God would not be expected to create organisms that are ideally fit in all ways.

But another point to note about these strategies is that they are actually attempts to tackle the problem of natural evil, rather than bypass it. So, the necessity of explanatory comparison between naturalism and design does make the problem of natural evil relevant for ID.

My third argument (3) for the relevance of the problem of natural evil to ID is based on the importance of worldviews for the debate. Even if our Western culture is sometimes characterized as “post-Christian”¹⁰³⁹, the monotheistic God of the Judaism, Christianity and Islam remains the most credible candidate for a designer for most people, including the ID theorists themselves, as I noted in chapter 3.1. This cultural situation seems to make it reasonable to evaluate the design argument as part of this broader context of reasons to believe or disbelieve in the existence of God. Culturally the most credible alternatives are currently naturalism and some form of theism. So, either a designer is perfect, or there is no designer at all. In this cultural context, the hypothesis that there is a designer, but that he is unable to create good design may be less credible than a wholly naturalistic scenario for many people.¹⁰⁴⁰ Because the ID theorists wish to impact our broader culture, engaging in such broader discussion should also be desirable for them.

It may indeed be true that the culturally reasonable opposition between naturalism and theism does not capture all the options adequately. As I pointed out in chapter 9.1, one way of showing that the problem of natural evil does not lead to atheism would be to argue that the problem should lead us to modify our conception of God, rather than to abandon belief altogether. It is conceivable that belief in the God described by modern process theology could for many people be more credible than believing in a fully naturalistic account of evolution, even with the problem of natural evil. But as noted, most of the ID theorists

¹⁰³⁷ Dembski 2000a.

¹⁰³⁸ Doran 2010, 226-227, 231.

¹⁰³⁹ Hart 2010.

¹⁰⁴⁰ It may be that the opposition is not credible even on traditional Christian premises – perhaps some features of life could have been made by angels or corrupted after their creation, for example. This would be a form of the free will defense, and I will come back to this idea shortly in the main text.

themselves are very traditional theists, so this does not seem like a strategy they would endorse.¹⁰⁴¹

My fourth argument (4) for the relevance of the problem of natural evil to ID is based on the ID theorists' own understanding of ID as a bridge between theology and science. In chapter three, I showed that many ID theorists think their argument provides evidence that is more consistent with belief in God than with atheism. ID has broad cultural aims beyond just promoting the design argument. As I showed in chapter 2.2, the ID movement also understands itself as a defense of the traditional theistic moral vision of the cosmos and humanity. ID's arguments are thought to provide a better framework for understanding the meaningfulness and value of life than those of the atheistic Darwinism.¹⁰⁴² In order for ID's design argument to be useful for this broader purpose, it must be related somehow to this broader theistic vision. This requires more knowledge of the nature of the designer and thus also requires dealing with the problem of natural evil.¹⁰⁴³

While it may in principle be possible to construct a design argument without interacting in great detail with the problem of natural evil, the broader context of the argument does not allow bypassing the problem this quickly. Fortunately, the ID movement has also attempted to tackle the problem more directly. Some of these more direct responses to the problem of natural evil have already been foreshadowed in the discussion so far. First (1), the ID movement argues that some proposed examples of natural evil are not actually evil, or that at least we are not in the position to evaluate how optimal they are. Dembski's arguments about junk DNA are one example of this. Second (2), the ID movement supplants its design hypothesis with auxiliary hypotheses to explain bad design. For example, as already noted, ID can be combined with parts of evolutionary theory, or it can be argued that the designer has some other reason for allowing bad designs and natural evil. Both types of answers follow strategies described in chapter 6.1.

¹⁰⁴¹ There are also some philosophical reasons for discounting any hypothesis of incompetent design. As Joseph Corabi (2009, 23-24) has argued, "*presumably less powerful or knowledgeable designers would be less likely to produce optimal and efficient mechanisms than God, but the knowledge and power required to design optimal and efficient biochemical systems might not be very great on a cosmic scale.*" Any being capable of manipulating the laws of nature and creating something as complex as life should also be capable to doing it optimally, it could be argued. But would such a being want to, and what would optimality look like? Once we start moving away from the theistic concept of God, predicting what this God would see as optimal becomes more difficult.

¹⁰⁴² E.g. Meyer 2013, chapter 20; Wiker & Witt 2006; West 2006, Wiker 2002.

¹⁰⁴³ Niall Shanks has similarly argued that the separation between the designer and God is "*technically correct but irrelevant.*" (Shanks 2004, 256). Because Dembski himself believe that the designer is God, he must face the problem of evil. While Shanks' general point about the importance of the problem of evil is correct, I do not think his characterization of Dembski's argument is quite fair: Shanks agrees with Dembski that the design argument cannot prove the existence of God, but still assumes that Dembski makes the leap to God on the basis of his design argument. "*The problem lies in Dembski's unwarranted leap to the conclusion of supernatural design using his methods for the mere detection of design.*" (Shanks 2004, 257.) Dembski does not do this, however. Dembski's reasons for believing that God is the designer originate outside the design argument itself. Ratzsch (2005) makes this point forcefully in his review of Shanks' book.

Does Bad Design Exist in Nature?

While proponents of ID do concede that some natural evils are real, they also claim that some other examples of natural evil or bad design are unconvincing. There are two primary ways of doing this. First, it can be argued that examples of bad design are actually examples of good design, when they are evaluated more precisely. Jerry Coyne argues that the wayward route taken by the human recurrent laryngeal nerve is evidence that it was not constructed by an engineer working to create the most efficient solution, but a historical process. It is “*one of nature’s worst designs.*”¹⁰⁴⁴ In response, ID proponents have argued that research actually shows this to be a functionally better solution than the straight route. In addition, if it were not optimal, the mutation to create a shorted nerve path is not very difficult and so evolutionary theory also should not expect the nerve to take a wayward route.¹⁰⁴⁵ Proponents of ID can similarly point to research highlighting the functional nature of vestigial organs like the human appendix, for example.¹⁰⁴⁶

In the case of cosmology, some examples of the hostility of the universe for life also seem to be poor. For example, the vastness of the cosmos is sometimes thought to be an argument against seeing the cosmos as life-friendly. However, John D. Barrow and Frank Tipler argue that under the current physical laws, the vast size of the cosmos is actually a requirement for the emergence of life. Under Big Bang cosmology, a universe which is 10 billion years old (and thus has had enough time for the synthesis of the heavier elements such as carbon inside stars) will also have had 10 billions years of time to expand. Thus the size of the cosmos is not a problem for the fine-tuning argument, but part of the fine-tuning.¹⁰⁴⁷ This does not demonstrate that God could not have created a universe with other kinds of natural laws that would not require for it to be large, but it is in any case unclear why the size of the cosmos is problematic for a God that does not have any difficulty making the cosmos as big as he likes. If there are no other planets capable of supporting life in this vast universe, the use of space is perhaps inefficient for a designer who is concerned with creating the maximum amount of life-forms per cubic meter of the universe. But why should we base our evaluation of the designer’s goodness on this criteria?¹⁰⁴⁸

Proponents of design arguments can also well argue that some evaluations of bad design are based on incomplete criteria. Thus Jonathan Witt argues that Gould’s evaluation of the panda’s thumb is flawed because it overemphasizes engineering efficiency:

¹⁰⁴⁴ Coyne 2009, 87.

¹⁰⁴⁵ Luskin 2010.

¹⁰⁴⁶ Luskin 2012.

¹⁰⁴⁷ Barrow & Tipler 1986.

¹⁰⁴⁸ Some examples of bad design depend greatly on our metaphysical assumptions. For example, some authors have argued that our finiteness itself implies lack of good and thus evil. This would seem to imply that the only way that our existence could be free of evil would be if we were, like God, omnipotent and self-sufficient. Others have argued that all finite existence is necessarily violent and there is no way to avoid the domination and use of others. But these premises are controversial. See David Bentley Hart’s analysis of the ontological claims underlying these and Hart’s theological response to it in his *The Beauty of the Infinite* (2003).

Must the cosmic designer's primary concern for pandas be that they are the most dexterous bears divinely imaginable? From a purely practical standpoint, might opposable-thumbed über-pandas wreak havoc on their ecosystem? From a purely aesthetic standpoint, might not those charming pandas up in their bamboo trees with their unopposing but quite workable thumbs be just the sort of humorous supporting character this great cosmic drama needs to lighten things up a bit? If Shakespeare could do it in his tragedies, why not God?¹⁰⁴⁹

Witt argues that we should not evaluate designs purely on criteria of tidiness and the efficiency of engineering. Rather, we should also consider the organism's role in the broader ecosystem, the beauty of the plurality of forms created and the possibility that the Creator might wish to commune with his creation before evaluating the goodness of the designs of nature. This seems reasonable from a theological perspective, but again requires a broader approach than just focusing on the minimalistic design argument.

This first type of responses to examples of bad design assumes that we can evaluate the goodness of the designs in nature. While skeptical of some criteria used to evaluate biological and cosmic order, the possibility of evaluation is not itself denied. However, ID's second response to the problem of bad design is based on a deeper type of skepticism about our evaluations. It argues that we cannot evaluate the optimality of the designs we see in nature, and so cannot judge them to be suboptimal. Behe makes the argument as follows:

The most basic problem is that the argument demands perfection at all. Clearly, designers who have the ability to make better designs do not necessarily do so. I do not give my children the best, fanciest toys because I don't want to spoil them, and because I want them to learn the value of a dollar. The argument from imperfection overlooks the possibility that the designer might have multiple motives, with engineering excellence oftentimes relegated to a secondary role. Another problem with the argument from imperfection is that it critically depends on a psychoanalysis of the unidentified designer. Yet the reasons that a designer would or would not do anything are virtually impossible to know unless the designer tells you specifically what those reasons are.¹⁰⁵⁰

For Behe, the ultimate criterion of "optimality" is thus correspondence to the purposes of the designer. However, supposing that these are unknowable without revelation from the designer, we cannot criticize a design as suboptimal. Robert Pennock, commenting on this, concludes that Behe has "*successfully insulated the design argument against the imperfection argument.*"¹⁰⁵¹ I agree that a minimal design hypothesis can be formulated even if the designs observed are inefficient. However, on the question of optimality, I think that Behe's response

¹⁰⁴⁹ Witt 2004.

¹⁰⁵⁰ Behe 2006a, 223. I am quoting the same text as Pennock 1999, 248.

¹⁰⁵¹ Pennock 1999, 249. The argument that the problem of natural evil is absolutely incompatible with the biological design argument is thus no more logically sound than the claim that the existence of evil is absolutely incompatible with the existence of the Christian God (see e.g. Plantinga 2000).

is problematic. As I showed in chapter 6.1, Behe argues that we can reliably understand what a system's immanent functions are, even though the designer's ultimate purposes are unknown to us. But if we can understand the system's immanent functions, we might also in principle be able to understand how efficiently the system is fulfilling these functions. As literature in the philosophy of biology shows, medical science depends on being able to diagnose when a system is not working properly – for example, when a heart is not able to pump as much blood as the organism needs. It seems that at least in some cases, we can be confident that some organ is not functioning as well as it could or should be. Therefore, we can and do evaluate design.¹⁰⁵²

Behe's argument does show that the hypothesis of minimal design is compatible with this discovery. It also shows that it is in principle possible for any design to be optimal related to the designer's purposes. On the minimalistic design argument, it could even be that the designer's purpose to create health problems for human beings. However, as I have pointed out, many ID arguments make use of a more robust concept of the designer. If the evaluation of optimality is indeed impossible, then creating such a robust design hypothesis also becomes impossible.

As I argued in chapter 9.1, to make the skeptical response work, one must balance a fine line where the Creator is both knowable and unknowable at the same time. The skeptical defense of design arguments must be humble in the face of reality's complexity without abandoning hope for knowledge about it. As with skeptical theism more generally, it may be that balancing this line is possible. Behe's argument that we can often detect design before we can identify the designer is experientially true. A similar experientially true claim is that we can often detect design much before we can judge ourselves to be in the position to make claims about the optimality of the design. For example, it is possible to understand that a computer's hard drive is designed before one can understand its structure so well that one can come up with good ideas to improve its functionality.

It can be argued that the situation is similar with the cosmos and life. Suppose that we can recognize that the cosmos and life are designed by looking at their intricate complexity and rationality which far exceeds anything that human beings have created. If some intelligence was able to create such order, then it seems reasonable to conclude that the intelligence was far more intelligent than we are, to such a degree that we should think it likely that we will not be able to outsmart this intelligence. So as we come to know the Creator of life and understand his intelligence by analogy with human intelligence, we simultaneously realize that he is much greater than we can comprehend and thus above our ability to criticize. Just as in Christian negative theology, in coming to know God we simultaneously also come to know that he is a mystery.

This line of argument has actually been taken up in the ID movement. Referring to Kant's argument of this type and the biblical story of Job, Dembski has argued that intelligent design actually helps answer the problem of natural evil, because it helps us

¹⁰⁵² See e.g. Melander 1997.

understand that the designer of life is greater than we are, and thus it is reasonable to be skeptical of our ability to criticize him.¹⁰⁵³ This is an attempt to balance on the fine line between knowledge and skepticism. This view does not lead to a similar doubt regarding our capability to recognize that some design is very good. Rather, it is just because we recognize that the designs are generally very good that we become skeptical of our own negative evaluations. As in the evidential strategy, evil is treated as an anomaly in the broader evidence which points to the wisdom of the Creator.

These types of responses to the problem of natural evil are also open to theistic evolutionists, and can in some cases help alleviate the problem. However, they do not solve the problem completely. Though we can understand some cases of natural evil to be misunderstandings and see that in some other cases we cannot be confident of our ability to judge that the design is truly of poor quality, in other cases the degree of imperfection or evil seems to be so great that such solutions are implausible. If we are to be at all confident in our ability to evaluate nature (even to recognize the wisdom of its Creator), it seems difficult to believe that we cannot at the same time recognize the imperfection and evil in these cases. The ID proponents themselves recognize this and propose other solutions.

Supplementing Design Arguments

As Pierre Duhem and Willard Van Orman Quine noted, it is rarely possible to falsify a complete scientific picture of the world with just one experiment. Rather than being isolated hypotheses that can be tested in this way, scientific theories often form a complex web of mutually reinforcing beliefs and hypotheses. Thus it is often possible to save a hypothesis from falsification by modifying the system at some point and introducing other explaining factors.¹⁰⁵⁴ Sometimes this is the reasonable and correct thing to do. For example, in the beginning of the 19th Century it became apparent that the orbit of Uranus did not confirm with the predictions of Newtonian mechanics. In this case, it was more reasonable to posit the existence of a new planet (Neptune) than give up the whole model.¹⁰⁵⁵ Proponents of ID can argue similarly that it is possible to supplement the design argument with auxiliary hypotheses in order to avoid falsification through bad design.

One example of clear natural evil that is difficult to explain away is provided by Behe, who argues that the molecular machinery of the malarial parasite is an *“exquisitely purposeful*

¹⁰⁵³ Dembski 2003a. The unreliability of our judgments that some feature of nature is nonoptimal could also be defended with an inductive argument, though I have not found this in the ID literature. If previous examples of bad design have been discovered to be well designed after all, then we have reason to believe that we will also find a function for some features of nature which we do not know a function for at the present. However, this type of inductive argument does not guarantee its conclusion. Some examples of bad design could be so compelling that it would be unreasonable to expect any good function to be found.

¹⁰⁵⁴ Quine 1953. Interpretation from Murray 2010, 97-98.

¹⁰⁵⁵ O'Connor & Robertson 1996.

arrangement of parts” and cannot be plausibly explained by naturalistic mechanisms.¹⁰⁵⁶ By Behe’s own logic, the malarial parasite is clearly designed. But a problem arises, because the parasite’s design is producing a great deal of suffering, and so the intelligent design we observe seems to be clearly morally evil. Behe admits that this is a hard question theologically, but not one that affects the minimal design argument: “*we can determine that a system was designed by examining the system itself, and we can hold the conviction of design much more strongly than a conviction about the identity of the designer.*”¹⁰⁵⁷ So, the design argument cannot say “*whether the designer of life was a dope, a demon or a deity*”.¹⁰⁵⁸ So Behe admits that some designs in nature are evil, but argues further that we cannot deny the conclusion of design simply because of this fact.¹⁰⁵⁹

Previously in this chapter, I pointed to Witt’s argument that we should evaluate the beauty of nature, not just its efficiency. The example of parasites is one where nature seems ugly, though efficient. Parasite wasps are highly useful for human farmers because they kill of many pests. Sometimes humans have thus even helped parasite wasps spread so that they would protect human farms.¹⁰⁶⁰ Nevertheless, there is something deeply ugly and unsettling about the whole phenomenon of parasitism. I have already quoted Darwin’s assessment: “*I cannot persuade myself that a beneficent and omnipotent God would have designedly created the Ichneumonidae with the express intention of their feeding within the living bodies of caterpillars or that a cat should play with mice.*”¹⁰⁶¹ The problem of natural evil is somewhat diminished once we realize that caterpillars have vastly different emotional lives than humans.¹⁰⁶² This does not remove the ugliness of the phenomenon, however. And there are also parasitical worms which live in human intestines and thus cause suffering for humans, so parasitism is not just a problem of animal suffering.

In cosmological design arguments about fine-tuning, some proposed answers to the problem of natural evil are also not convincing. Consider earthquakes. Defending the design argument, Michael Denton argues that earthquakes are a consequence of the activity of the Earth’s geology, which is necessary to circulate heavier elements from the Earth’s depths to its surface, where life can make use of them.¹⁰⁶³ This response seeks to show that earthquakes, too, have a purpose for life: that even in this instance, nature is fine-tuned to benefit life. To be fair, this is not just Denton’s response, but a common feature of the nomic regularity defences described in chapter 9.1.¹⁰⁶⁴ However, here Hume’s question about the insufficient fine-tuning of natural laws seems pertinent. On a theistic view, one can ask whether it is really plausible that geological activity could not be so optimized by an

¹⁰⁵⁶ Behe 2007, 237.

¹⁰⁵⁷ Behe 2006a, 196.

¹⁰⁵⁸ Behe 2007, 238-239.

¹⁰⁵⁹ Similarly Richards 2007.

¹⁰⁶⁰ See Elizabeth Pennisi’s article “The Little Wasp That Could” (2010) for more details.

¹⁰⁶¹ Darwin 2012 [1860].

¹⁰⁶² See answer #5 in chapter 9.1.

¹⁰⁶³ Denton 1998.

¹⁰⁶⁴ Murray 2011, chapter 5.

omnipotent deity creating the world *ex nihilo* as to recycle the elements without causing earthquakes.¹⁰⁶⁵

So, how is ID to get out of this problem? Did God indeed design the malarial parasite, earthquakes and other ugly features of nature? This would seem to be contrary to God's good nature, unless we accept a strong form of skeptical theism with all its problems. The ID movement's possible responses to the issue follow strategies 5-8 listed in chapter 9.1. The movement can argue that these evils are created for enabling some greater good, such as the development of character, or allowing free will and nomic regularity.

Many ID theorists who comment on the problem of natural evil argue that the origin designs of the Creator may have been corrupted over time. Dembski argues that "*the good that God initially intended is no longer fully in evidence. Much has been perverted. Dysteleology, the perversion of design in nature, is a reality. It is evident all around us.*"¹⁰⁶⁶ Dembski argues that this kind of corruption is not unknown even in the case of human design: "*Objects invented for good purposes are regularly co-opted and used for evil purposes. Drugs that were meant to alleviate pain become sources of addiction. Knives that were meant to cut bread become implements for killing people. Political powers that were meant to maintain law and order become the means for enslaving citizens.*"¹⁰⁶⁷ Jay Richards similarly argues that "*By looking carefully, we might be able to distinguish the original design behind its degraded condition. For instance, some design theorists have suggested that many bacteria that kill us or make us sick might have gotten that way by mutation. They might have been harmless or helpful to humans in their original form. Or maybe we have become more susceptible to them.*"¹⁰⁶⁸

However, these texts are ambiguous about just what has acted to corrupt nature against the good purposes of God, and why God allows such corruption to take place. The possibility of this response to the problem of natural evil from the ID point of view depends not just on our theology, but also on what the ID proponent believes about the capabilities of the evolutionary process. Some of the examples of natural evil, such as Behe's example of malaria, require highly complex molecular machines. Because ID proponents do not generally accept the capacity of the evolutionary process to explain such complex structures, it is difficult to view these simply as consequences of a regular evolutionary cosmos.

One option is to bite the bullet and accept that God himself is responsible for the corruption of nature. Dembski argues that dysteleology is the result of a divine curse on creation because of human sin. In the modern discussion, this explanation is typically

¹⁰⁶⁵ On Denton's own view this is not a problem, however, because Denton does not believe that God created *ex nihilo*. Rather, Denton believes that the Creator worked on pre-existing matter and created the best world that this matter allowed for.

I do not mean to argue that there are no better answers to the question of natural evil; just that the strategy of showing that natural evil is actually not evil does not seem to answer every difficulty. The question was posed eloquently by Voltaire after the Lisbon earthquake in 1775: can the suffering of small children caused by earthquakes really be a necessary feature of the "best possible world"? On this discussion see Hart 2005.

¹⁰⁶⁶ Dembski 2000a.

¹⁰⁶⁷ Dembski 2000a.

¹⁰⁶⁸ Richards 2007.

rejected for the simple reason that because the cosmos began billions of years before humans, dysteleology predates human sin. However, Dembski argues that the foreknowledge of God can solve this problem. The cosmos was created to be a fitting place for sinful humans, since God knew that humans would sin. Since God is not unjust and did not want to punish humans before they actually committed sin, God created the Garden which protected the first human couple from the effects of sin before their transgression. After the fall, God banished humans from the Garden to suffer the pre-prepared consequences of their actions. Dembski argues that suffering also has a redemptive purpose, however, in that it teaches humans to avoid evil.¹⁰⁶⁹ So, Dembski is combining the free will theodicy (strategy 6) and the soul-making theodicy (strategy 5) that I described in chapter 9.1

Another option that avoids reference to divine foreknowledge is to explain the corruption of creation by reference to the fall of angels and the subsequent actions of these fallen angels. This solution is indirectly hinted at by Behe's wording that a "demon or a dope" may be responsible for the evil designs in nature. Neither Behe nor any other ID writer has committed himself to this demonic theodicy, and Dembski has directly criticized it. Dembski argues that though it could be that God allows free creatures such as humans and fallen angels to produce evil in the world, this would not entirely eliminate God's responsibility for this evil. Rather, Dembski argues that Christians must accept that God bears the ultimate responsibility for evil, even if he merely allows it, and that no view can absolve God of this responsibility.¹⁰⁷⁰

Missiologist Ralph Winter reports that he once asked Phillip Johnson whether biological viruses should be explained as the creation of evil intelligent design:

His answer, essentially, was, "Ralph, in my writings and public appearances I can't even mention God much less Satan. I have a very specific battle to fight, namely, to take apart the logic of unaided evolution. That is all I am trying to do."¹⁰⁷¹

Here Johnson's response is not to deny the demonic explanation of natural evil, but to avoid it for strategic reasons.

Though no ID theorist has defended the idea, it seems to me that belief in the existence of both good and evil designers would be quite a natural conclusion from the logic of ID's design argument. If we can make estimates of the wisdom and intelligence of the designer using human analogies, what is to stop us from also making estimates of the designer's morality? The central problem of the demonic hypothesis is indeed the low prior credibility of the existence of demons in our cultural situation. Furthermore, Dembski's question is also valid: it can be asked why God allows the free will of created beings to corrupt his creation

¹⁰⁶⁹ Dembski 2009 is an extended defense of this theodicy.

¹⁰⁷⁰ Dembski 2009, 150.

¹⁰⁷¹ Winter 2013.

as much as this theodicy requires. However, similar questions can be asked of any theodicy.¹⁰⁷²

One problem with adding auxiliary hypotheses to explain natural evil is that explanatory simplicity and testability have traditionally been regarded as a virtue of good explanations. So if naturalistic evolutionary theory could explain all the features of life with just naturalistic mechanisms of evolution and the hypothesis of common descent, this would seem to be preferable to a hypothesis that also included intelligent design as an additional explaining factor. A vague hypothesis including several designs is also difficult to test against the goodness and evil in nature: anything good in nature can be explained by the actions of the good designer, while anything evil can be explained by referring to the evil designer. A design hypothesis like this may still be falsifiable in other ways, however. And a more specific hypothesis of design that states that the evil designer is much weaker and can only corrupt what the good designer has created could perhaps be more easily falsifiable. For example, if we found out that more evil than good exists in nature (as Paley and many other natural theologians claim), this would seem to count against this idea.

Although simplicity would lead us to prefer explaining everything with just one hypothesis, it could in principle be that biological reality is too complex to be explained by just one hypothesis. As I pointed out in chapter 6, proponents of ID argue that the Darwinian mechanism of natural selection and mutation does not have sufficient causal powers to explain the origins of most of life's complexity. If this were correct, then the Darwinian mechanism would be a bad explanation for most of life, even if the designs exhibited by that life are less than optimal. As Joseph Corabi has argued, the problem of natural evil is not by itself a sufficient argument against ID, since it could well be that the probability that a naturalistic process could produce life at all could still be much lower than the probability that an incompetent cosmic designer exists, or the probability that a good God would create suboptimal designs.¹⁰⁷³

However, some have argued that there is a tension between ID and the theodicies based on the value of nomic regularity in the universe, free process defence and the chaos-to-order defence. This is argued to be a large problem for ID theologically, even if it is not an insurmountable problem for the design argument if the argument is otherwise sound.

9.3. Theodicy as a Problem for ID?

The Necessity of an Evolutionary Theodicy

Several prominent writers in the debate on Intelligent Design have argued that the problem of natural evil makes ID theologically heretical, or at least close to heresy. This very strong

¹⁰⁷² See Boyd 2001, chapters 8-10 for an extended defense of the demonic theodicy and Murray 2011, chapter 3 for some mild critiques of this approach.

¹⁰⁷³ Corabi 2009.

claim has been advanced even by such an esteemed figure as Francisco Ayala. According to Ayala, “the natural world abounds in catastrophes, disasters, imperfections, dysfunctions, suffering, and cruelty”¹⁰⁷⁴ and he shudders “in terror at the thought that some people of faith would implicitly attribute the calamity to the Creator’s faulty design.”¹⁰⁷⁵ Ayala even goes on to state that “attributing these to specific agency by the Creator amounts to blasphemy”¹⁰⁷⁶ “Darwin’s gift” to religion is the possibility to absolve God of the responsibility for any such natural evils.

The same argument is also made by several other prominent writers in the discussion, including *Biologos* writers Karl Giberson¹⁰⁷⁷ and Darrel Falk¹⁰⁷⁸ as well as philosopher of biology Michael Ruse.¹⁰⁷⁹ Their argument utilizes the nomic regularity, free process and chaos-to-order defences described in chapter 9.1. The basic idea of this Darwinian theodicy is the following. Supposing that God wanted to create life through a natural process that was free to evolve in any direction, then any interventions by God into the development of life would constrain this freedom and constitute breaks in the nomic regularity of nature. In this theodicy, the absolute autonomy of the creation from its Creator and the absolute continuity of the nomic regularity are believed to be so valuable that preserving them justify also allowing the evolution of natural evil. Michael Ruse explains the importance of Darwinian evolution for this theodicy clearly:

But supposing that God did (and had to) create through law, then Richard Dawkins of all people offers a piece of candy to the Christian. Dawkins argues that the only physical way to get organic adaptation -- the design-like nature of living beings -- is through natural selection, that very painful mechanism that worried Darwin! Other mechanisms are either false (such as Lamarckism, the inheritance of acquired characteristics) or inadequate (such as saltationism, change by sudden jumps). In other words, although Darwinism does not speak to all cases of physical evil -- the earthquakes -- it does speak to the physical evil that it itself is supposed to bring on. It is Darwinism with suffering, or nothing.¹⁰⁸⁰

The argument is that if God wanted to create through an evolutionary process, then he had to create through the Darwinian process and the existence of suffering was inevitable. Life is so valuable that producing it justifies using these means, so God is absolved of blame. Or so the argument goes.

However, many questions remain. Why would God choose to create through an evolutionary process if this process inevitably includes suffering? In the discussion, three

¹⁰⁷⁴ Ayala 2007, x.

¹⁰⁷⁵ Ayala 2007, xi.

¹⁰⁷⁶ Ayala 2007, 160. See also Ayala 2006 and the discussion in Ayala 2008 and Doran 2009.

¹⁰⁷⁷ Giberson 2009.

¹⁰⁷⁸ Falk 2009.

¹⁰⁷⁹ Ruse 2011, for more details see Ruse 2003, chapter 15 and 2001, chapter 6.

¹⁰⁸⁰ Ruse 2011.

basic reasons for this divine choice have been presented.¹⁰⁸¹ First (1), it is arguably an intrinsic good for the universe to exhibit progress; such a method of creation is thought to be more beautiful than creating through miracles. For example, Howard van Till has argued that a universe with the capability to evolve is “fully gifted” whereas a universe without such a capability is lacking a good thing. Creating through a process can also be argued to require more skill from the Creator, thus providing a more adequate demonstration of his power and wisdom.¹⁰⁸² Three main critical questions about this approach are (A) whether we think this good truly outweighs or justifies the value of suffering caused in the evolutionary process, (B) whether the universe could also exhibit progress even with a shorter history involving no suffering at all, and (C) whether there might be some additional value also in creating through miracles. For example, many church fathers also believed that God created life through a process, but did not describe this process as one involving suffering and did not believe that it took such a long time.¹⁰⁸³

Second (2), some have argued that a universe possessing autonomy must be evolutionary. For example, theologian John Haught has argued that in order for the universe to be truly distinct from God, it must be capable of evolving in any direction freely.¹⁰⁸⁴ Karl Giberson similarly argues that “*unless God micromanages nature so as to destroy its autonomy, [natural evils] occur. Likewise, unless God coercively micromanages human decision making, we will often abuse our freedom.*”¹⁰⁸⁵ Though there is much more depth to this approach than I can do justice here, some hard questions remain. The conception of autonomy in particular needs more work. In what sense would it destroy nature’s autonomy if God were to create directly, rather than through an evolutionary process? Haught argues that in this case, the universe would be merely an appendage of the deity. But as Michael J. Murray argues, it is hard to see why. In creating a painting, for example, a human artist does not merely create an appendage of himself; why should God be unable to create something distinct from himself? Furthermore, if creating directly merely creates an appendage of the deity, then it is difficult to see how evolution solves the problem. If we believe in the creation of the world out of nothing, then God has created the initial state that evolution begins from. If this initial state is merely a “part” of God (because it was directly created by God), why should we assume that further evolution will make the part distinct from God?¹⁰⁸⁶

¹⁰⁸¹ Murray 2011, chapter 6. I am modifying Murray’s account somewhat, since he writes four different responses: (1) the value of progress, (2) enabling narrative structure, (3) divine hiddenness and (4) the value of a chaos-to-order process. Here I have combined his first and fourth response (the value of progress and the value of a process bringing order from chaos) because a process bringing order from chaos sounds very much like progress to me. So arguing that a chaos-to-order process has intrinsic value is the same as saying that progress has intrinsic value, and a chaos-to-order process was chosen because it exhibits progress.

¹⁰⁸² Van Till 2000 & 2001.

¹⁰⁸³ See e.g. Murray & Wilkinson 2010. I also pointed analysed the apologetic questions on miracles in chapter 7.2.

¹⁰⁸⁴ Haught 2003.

¹⁰⁸⁵ Giberson 2009.

¹⁰⁸⁶ Murray 2011, 170-175; 2009b, 365-367. It seems to me that a better model of autonomy than the one criticized would be to argue, following David Bentley Hart (2003, 18-19), that the distance between creation and Creator is formed when the Creator looks at what he has created and pronounces it beautiful.

Third (3), it has been argued that God chose to use the evolutionary process in order to keep himself hidden. For example, biologist Kenneth Miller has argued in his work *Finding Darwin's God* that if God were to create through a non-Darwinian process, then his existence would be so evident in the biological marvels of life that it would make human free choice impossible.¹⁰⁸⁷ The presence of a policeman will make it very difficult for people to choose without pressure whether to obey the law or to disobey it. Similarly such pressing knowledge of God's existence would, it is argued, make it difficult for people to make a free moral choice between loving God and rejecting him. So in order to make human morality possible, God must maintain a certain epistemic distance between himself and humanity. There is much to be said for the general argument from divine hiddenness, but the conclusion that God therefore had to use a Darwinian process is questionable. Murray makes the point well: "*Would the presence of a creator who evidently creates a fully-formed universe within the last ten thousand years improperly overwhelm creaturely freedom? It is hard to make this argument plausible when we take note of the fact that vast numbers of people over the last two millennia have believed in just such arguments. That is, prior to 1859, many if not most in the West fully accepted that the data –theological, philosophical and empirical – resoundingly implied the existence of just such a being. As a result, for this claim to be plausible we would have to believe that the free and effective choice of all of those who accepted such arguments during this period was disabled. Needless to say, this is unbelievable.*"¹⁰⁸⁸

The three main theistic reasons for the necessity of an evolutionary process all remain somewhat unconvincing. It may be that a more coherent case for the necessity of evolution could be made from the perspective of process theism, which already includes the process-like nature of creation in its basic philosophical background. But perhaps the evolutionary theodicy could nevertheless provide the best response to the problem of natural evil, even if it is not required for other theological reasons? The theological argument against ID is that if the best or only way of solving the problem of natural evil requires accepting Darwinian evolutionary theory, then models which question Darwinian evolution are theologically problematic. The problem of evil then becomes a powerful a theological reason for rejecting ID and accepting Darwinism. Rather than providing one possible way of building a bridge between science and theology, ID's success would actually provide evidence against the existence of the Christian God.

The Unnecessity of an Evolutionary Theodicy

I see two large problems in the theological critique of ID based on the evolutionary theodicy. First, even if the Darwinian theodicy is a good one, this does not by itself show that there are no other ways of answering to the problem of natural evil. In order for the lack of a

¹⁰⁸⁷ Miller 2002, 290.

¹⁰⁸⁸ Murray 2011, 180.

Darwinian theodicy to be problematic for ID, those defending this theological argument would have to show that none of the other answers to the problem of natural evil are at all satisfactory. As Murray notes in his *Nature Red in Tooth and Claw* (2011), it seems possible to build several different types of combinations from the various answers to the problem of natural evil, and not all emphasize the importance of the nomic regularity, free process and chaos-to-order defences in the same way.

In practice, Ayala and the other defenders of this theological critique of ID have not produced any deep analysis of the other possible answers to the problem of natural evil. The closest I have found to this is Darrel Falk's brief critique against theodicies based on the cosmic effects of the angelic fall.¹⁰⁸⁹ However, even if the free will theodicy in the case of natural evil were refuted (which still requires further demonstration), this would still not mean that there is no other way of trying to respond to the problem of natural evil besides the Darwinian theodicy. It would also have to be shown that none of the other theodicies and defences presented in chapter 9.1. are usable for ID proponents.

So, the first problem in this theological critique of ID is that the necessity of the Darwinian theodicy has not been demonstrated. The second problem in this critique is the inherent weakness of the Darwinian theodicy. Robert J. Russell, no friend of ID, thus argues that the Darwinian theodicy is "Theodicy Lite." As noted, a major underlying assumption of the Darwinian theodicy is that if God wanted to create life through natural laws, he had no choice but to rely on Darwinian evolution, and no choice but to allow the evolution of natural evil. However, as Russell argues, this assumption is strange if we believe in an omnipotent God who creates out of nothing:

¹⁰⁸⁹ According to Falk, it is not credible for the ID theorists to claim that sickness-inducing bacteria are products of unguided evolution, since they do not believe that naturalistic evolution has the capability to produce the molecular machinery necessary for this. If this is correct, then attributing these designs to the actions of the devil is the only remaining credible alternative. But this, according to Falk, is theologically problematic: "*Who is the new creator? Does Satan have power to create? Surely not the Satan of Christian theology—that Satan functions to destroy, not create. The whole story of intelligent design starts getting absurd, and it doesn't fit with any orthodox Christian theology.*" (Falk 2009)

There may be something to this critique. It may be that explaining natural evil requires attributing creative powers to demons to an extent that is theologically problematic; in the Bible even many features of nature which humans see as fearful are sometimes presented as evidence of the glory of God. Christ himself is compared not just to a lamb, but also to a lion. However, showing that there is a theological problem here would require a more thorough analysis. It also has some in-depth defences (e.g. Boyd 2001; Murray 2011, chapter 3)

The meaning of the words "create" and "destroy" is central. ID theorists who adopt the demonic theodicy could argue that though the devil cannot create from nothing, one way he destroys is by corrupting what God has created. So all evil designs must be corruptions of structures of what God has created, rather than something made out of nothing. Also, it seems strange to think that it is blasphemous to think that an angelic intelligent being could have sufficient power to manipulate life if one simultaneously believes that the laws of nature have the powers to do much more autonomously from God. Why should believing that one part of nature (angelic beings) have creative powers be more heretical than believing that another part of nature (matter and energy in free process) have these same creative powers? It seems to me that the more central problem for the demonic theodicy is the difficulty of believing in the existence of demons, not any heretical nature of this belief.

Admittedly if God were to create life without intervening in the nature and if the laws of physics which govern these processes are taken for granted, then God may have had “no choice” other than Darwinian evolution. But if we push it one step further, the question returns at a more fundamental level in what I will call “cosmic theodicy.” The point is that God created our universe ex nihilo with the specific laws of physics and constants of nature which make Darwinian evolution possible. Why then did God choose to create this universe with these laws and constants knowing that they would as a consequence make the full sweep of natural evil inevitable? In effect, the Ruse/ Dawkins argument does not rescue God from blame, but merely places blame at a foundational level, leading to the Leibnizian challenge: is this the best of all possible universes?¹⁰⁹⁰

So, Russell argues that the Darwinian theodicy does not succeed in absolving God of the blame, because an omnipotent God could plausibly have created different laws of nature and nature constants, creating life through another kind of process that did not result in any suffering or at least not as much suffering. In classical Christian theology, God is not thought to be constrained by the natural laws in choosing the way he creates. Rather, the natural laws themselves are a free creation of God. If we think that God must have created through a naturalistic process, then the modern theory of evolution does seem to be the most scientifically credible attempt to describe this process. However, despite some arguments to the contrary, this does not show that God must have created these particular natural laws. It seems that any possibility for an evolutionary process must have been created by God himself. Much more work has to be done to show that a world with Darwinian evolution is indeed the sort of world that we would expect God to necessarily create.¹⁰⁹¹

The problem of divine freedom for any account which supposes that God must of necessity do something was already noted in chapter 5.2. There I also noted that this nevertheless need not stop us from trying to find out reasons for some divine action, just as the idea of human freedom does not stop us from finding reasons for human action. Collins builds his own theology of evolution in just this way. According to Collins, finding a rationale for God’s use of evolution can only happen after we have already become convinced by the empirical evidence that God did indeed use evolution.¹⁰⁹² After this, it becomes plausible to argue that evolution indeed was the best way, or at least a very good way of creating. However, this more defensible way of building a theology of evolution does not justify theological criticism of ID, since this theological view does not include any necessary theological rationale for evolution that is independent of our acceptance of evolution based on the empirical evidence.

¹⁰⁹⁰ Russell 2013, 179; see also Russell 2008, chapters 7 & 8.

¹⁰⁹¹ DeWeese 2013 provides some interesting further speculation in this vein – he argues that we should expect God to create a world that works through free chaotic processes, because such processes are important for the ability of free agents to create truly novel things. Some problems and benefits of explaining natural evil by reference to free will were noted earlier in chapter 9.1; see also Murray 2011, chapter 3. Southgate (2011, 387-388) also argues that evolution as we know it “*was indeed the only way, or the best way, God could give rise to creaturely selves.*”

¹⁰⁹² Collins 2009.

Intelligent Design's Response to the Theological Critique

In its own response to the theological criticism based on the problem of natural evil, the ID movement has also highlighted the same two problems: (1) that the Darwinian theodicy does not seem to absolve God of the responsibility for natural evil, and (2) that there are other ways of responding to the problem of natural evil. Like Russell, Behe and Dembski have also argued that the Darwinian theodicy does not absolve God of responsibility, because God will nevertheless be responsible for the sort of processes and possibilities he creates.¹⁰⁹³ They do not accept the analogy between the freedom of the moral agents and the freedom of natural processes, because they understand these natural processes as inevitably controlled and planned by God in some way, whereas the choices of moral agents are planned by humans.¹⁰⁹⁴ Giberson, in contrast, argues that there is a good analogy between the freedom of human moral agents and the freedom of the creation, but does not defend this analogy in any depth against the charge that it is just an anthropomorphism: an attribution of qualities that are valuable in personal agents to something that cannot have them.¹⁰⁹⁵

In response to Ayala, Behe argues that defenders of the design argument can also appeal to the role of "natural evil" in making possible some greater good, and that God has granted nature a great deal of autonomy, even if his direction is important in crucial parts of the history of nature. Behe argues that not just any laws of nature will allow for the emergence of complex human life and creaturely freedom, so even those who believe that life has emerged through natural processes will have to believe that God has somehow directed the course of evolution.¹⁰⁹⁶ There is empirical support for this premise: as I argued in chapters 6.4 and 8.2, the possibility of evolution appears to require fine-tuning and is constrained by natural laws. The arguments of Simon Conway-Morris are also again relevant: it seems that the course of the evolutionary process may be at least partly written into the laws of nature.¹⁰⁹⁷ If so, then even a Darwinian view will indeed not imply the total freedom of the creation to evolve anything at all. If this sort of control of evolution by God does not destroy the creation's autonomy, then it needs to be clarified what makes the sort of control envisaged by the ID movement different.

Both theistic evolution and ID typically assume that God has in some way directed or controlled the evolutionary process, but that God has left enough freedom in the world to allow for the evolution of natural evil. So, both approaches must similarly assume that God has chosen the right balance between direction and freedom: enough direction to make the

¹⁰⁹³ Behe 2007c,

¹⁰⁹⁴ Behe 2007c; Dembski 2009; 2013.

¹⁰⁹⁵ Giberson 2009; see also Giberson & Collins 2013. For a critique of this defence as anthropomorphism, see Murray 2008, 174-175.

¹⁰⁹⁶ Behe 2007c.

¹⁰⁹⁷ Conway-Morris 2005.

existence of intelligent life possible, but so much freedom that this explains the existence of natural evil. Though explanations for how natural evil came about are often different within ID and theistic evolutionism, there is much common ground in the underlying logic. Most of the theological critiques of ID come from theistic evolutionists who believe that God acts in the world. These are not typically deists who believe that God merely set up the system in the beginning¹⁰⁹⁸

Perhaps the difference is in the amount of control God exercises over the evolutionary process. As Giberson puts it, Intelligent Design implies that God micromanages nature down to its fine biochemical details, designing the biochemical machinery of living cells.¹⁰⁹⁹ Perhaps theistic evolutionism can allow the creation relatively more autonomy than ID's view, where the creation has much smaller power to evolve. The theological problem for ID can then be restated as a general problem of divine action theory: if God acts in the world at all, why does he not act even more?¹¹⁰⁰ As Corabi argues, if one accepts Intelligent Design, then one cannot argue that God has chosen to create a world completely without any nomic irregularity. In that case, Corabi argues, it becomes more difficult to claim that God should not have intervened in nature even more.¹¹⁰¹ If God has already micromanaged nature up to its fine biochemical details in millions of cases, then we can ask why God has not micromanaged nature even more so as to prevent the evolution of the malarial parasite, for example.¹¹⁰²

Corabi also provides what he thinks is the most plausible answer to this question. Let's suppose that designing life requires a relatively small amount of interventions into the natural order. For example, maybe it requires thousands of miracles in the history of life in order to build the most important "irreducibly complex" systems. Related to the length of history and the enormity of the world, it can be argued that these do not yet create "massive irregularity" in nature.¹¹⁰³

Since theists already typically believe that God acts in the world, it is difficult to limit precisely how much God can act before this becomes problematic for the regularity of creation and the possibility of creaturely freedom. If the one act of raising Jesus from the dead does not yet create massive irregularity in the world, why should directing the evolution of the bacterial flagellum create massive irregularity? It is difficult to evaluate such

¹⁰⁹⁸ Darrel Falk, for example, writes that "*in Scripture we have this mysterious interplay between the ongoing assurance of God's Spirit and a life lived in freedom including, even, the harmful by-products that freedom brings with it.*" (Falk 2009)

¹⁰⁹⁹ Giberson 2009.

¹¹⁰⁰ Murray 2008, 148-149; 2009, 369. The arguments for the necessity of nomic regularity are typically based on the bad consequences that massive irregularity would create for the world. Humans could no longer study and trust in the fundamental rationality of the world and could not reliably interact with each other or make moral choices. However, it is not clear why a small amount of irregularity would jeopardize these aims, so critics of this defence can always already ask why God does not do more to minimize suffering. The question that ID raises about the amount of divine intervention in the world seems to be quite relevant even without ID, then. The nomic regularity defence does not seem to be sufficient in itself.

¹¹⁰¹ Corabi 2009, 23-28.

¹¹⁰² Ruse 2003, chapter 15 & 2001, chapter 6.

¹¹⁰³ Corabi 2009, 30-31.

things. However, it seems that if the defence based on nomic regularity is to be valuable at all from the viewpoint of traditional Christian belief, then this nomic regularity must not rule out all divine intervention in the world. The Creator must be able to interact with his creation without jeopardizing its autonomy and regularity. Much further work must be done before it is possible to argue confidently that the amount and type of miracles required by ID (if it indeed requires miracles at all) is enough to make nomic regularity defence impossible.¹¹⁰⁴

Some Conclusions from the Discussion

In this chapter I have spent much time describing results from the discussion of the problem of natural evil that has been happening in the past decades. I have felt it necessary to go into this discussion in such depth, because the discussion has typically been conducted without situating it in this broader context. Nevertheless, the broader discussion contains many insights that are useful for the discussion on Intelligent Design.

Based on the analysis presented in this chapter, the problem of natural evil does not settle the discussion on Intelligent Design in the way that is sometimes presented. Proponents of ID would do well to discuss the problem more, since it is indeed relevant in the broader context of their argument. However, the problem of natural evil does not in itself provide a sufficient philosophical or theological critique of ID.

The problem of natural evil is worthy of continued attention in the discussion because it reveals the philosophical and theological assumptions of all sides of the debate so clearly. It is clear that the acceptance and rejection of design arguments is often based on theological considerations. Though the ID movement sometimes seeks to bypass theological concerns, it seems that the theological side of the discussion also needs to be engaged if the ID movement, since it inevitably influences perceptions of ID.

In this chapter, I have been arguing that in addition to many thinkers of the ID movement, many of the movement's critics are also influenced by philosophical and theological considerations. The problem of natural evil is seen as a highly pressing reason to

¹¹⁰⁴ The nomic regularity defence, though valuable, seems insufficient in itself. William Alston (1994), 55-56 argues that even rejecting the possibility of divine interventions entirely would only move the problem back: *"The point is that the problem of evil is so severe anyway, even if there is no divine intervention, that the accretion due to the distribution of divine intervention is hardly significant. Even if God's activity vis-à-vis creation is confined to initially setting things up in the way he does, there are more than enough questions as to why he has done it this way. -- Thus, quite apart from problems concerning divine intervention, we are faced with unanswered questions, perhaps unanswerable by us in this life, questions as to why God has devised His creation as He has. Hence, if a theistic position is tenable at all, it is tenable in the face of an inability to answer such questions, and so our inability to answer such questions concerning divine intervention can hardly be a conclusive reason for rejecting it. If our inability to answer such questions is a conclusive negative reason, then theism goes down the drain whether we accept divine intervention or not. And if it is not a conclusive negative reason, it leaves the belief in divine intervention standing."* See also Murray 2008, 5.

reject ID. Clearly, the theological and philosophical side of the debate is important and should be discussed openly.

10. CONCLUSIONS

The preceding chapters have been an analysis of the debate on Intelligent Design with the aim of answering two questions. First (1), *what is the structure of the Intelligent Design movement's design argument and what are its central concepts and presuppositions?* Second (2), *How does Intelligent Design relate to theistic evolutionism and naturalistic evolutionism on the question of design?* In addition, I have attempted to advance the discussion on the central philosophical and theological questions of the debate. It is now time to summarize my answers to the research questions, and to recap some of my ideas about the debate.

10.1. The Design Argument

The Structure of the Design Argument

The ID movement's design argument is an attempt to defend the idea that the order of nature has marks of intelligent design. Research in the cognitive sciences of religion supports the idea that humans indeed have a tendency to interpret nature teleologically, and believe in a Creator. The ID movement also sees its arguments as supporting the reliability of this intuitive interpretation of nature's order. Contrary to some critiques, such strong commonsense intuitions do seem to provide at least some prima facie reason to believe in a designer. However, as with other commonsense beliefs, this does not mean that such evidence could not be overturned or supported by further arguments. So, exploring arguments for and against the reliability of this intuitive conclusion still seems highly desirable. Appeals to common sense or its failure are not themselves sufficient to settle the discussion.

ID indeed does not rely on just our intuitive reasoning, but attempts to develop rigorous philosophical, even scientific design arguments. Proponents of ID have defended several different formulations of the design argument. I analysed formulations of the design argument as an analogy, an induction, an inference to the best explanation and an inference to the only explanation. Though design arguments have often been understood as analogies, I argued that ID's version of the argument is better understood as an inference to the best explanation or to the only explanation. These inferences work by positing that design best explains certain features of the cosmos and the biological world, such as fine-tuning and irreducible complexity. The critique of alternative explanations is crucial for these argument types, but a positive connection between intelligent design as a cause and the properties explained is needed.

I argued that the ID movement's design argument gains its explanatory power from the perceived connection between teleological properties and design as a teleological process. This connection is argued based on inductive observation, subjective experience of the nature of intelligence, and rational intuitions. Many thinkers in the ID movement prefer using technical terms like "specified complexity" instead of teleology when describing the

complexity of nature. However, they typically move back to the language of teleology when it comes time to explain the explanatory power of the argument. It is argued that the appearance of teleology in nature is best explained by a teleological cause: intelligent design.

My analysis of the logic of the design argument and thought experiments supports the possibility that this type of inference could indeed in principle work. Whether the actual world contains evidence that can be identified in this way is another matter. Many critics of design arguments also acknowledge that there are features of nature which are congenial to the design-based explanation. When design-based explanations are rejected, it should be done after first considering the details of the arguments, and the evidence presented.

To reject ID's design arguments, one should also argue that it is more reasonable to accept some other explanation than design, or at least that it is more reasonable to wait for such an alternative explanation, than to accept the conclusion of design. ID's design arguments require that such alternative explanations can be shown much less improbable than design. Just how improbable the natural explanations have to be shown depends on conceptions about the prior credibility of the design hypothesis. ID assumes an interpretation of the philosophy of mind in which intentionality can really be the true explanation of human behaviour, and even an unembodied designer could have sufficiently analogous properties for the argument to work. Furthermore, in order for the argument to work, the existence of this kind of nonhuman designer must be accepted as a possibility that could in principle be supported by the evidence.

Cosmic and Biological Design Arguments

The ID movement sees a positive connection between cosmic and biological design arguments. Cosmic design arguments are based on the idea that the fine-tuning of the natural laws and the rationality of the cosmos are best explained by postulating a designer, usually seen as the God of theism. The ID movement argues that the cosmic and biological arguments provide two mutually reinforcing lines of evidence. Theistic natural theologians have long argued that the rationality of the cosmos provides evidence that resonates with belief in a Creator. The ID movement argues that admitting the existence of such a cosmic designer opens up further questions. It is argued that a designer has also acted within natural history to ensure the existence of higher forms of life, rather than merely designing the natural laws. This use of several different arguments to support the same conclusion finds significant analogies in theistic natural theology.

However, there are also tensions between the cosmic and biological design arguments. Cosmic design arguments clearly move outside the realm of natural science, whereas the ID movement's biological design arguments include critiques of Darwinian evolutionary theory and naturalistic origin of life-scenarios. Though both arguments are derided as "God of the gaps"-arguments, this charge seems to have more relevance in the case of biological design arguments. This is because natural history has generally been thought of as the domain of methodologically naturalistic science, whereas explaining the cosmic order is traditionally the domain of philosophy and theology.

Both types of arguments depend on the possibility of finding limits to natural explanations, since both claim to explain phenomena where naturalistic explanations fail. The difference is only that it is more credible that these limits are real in the case of the order of the laws of nature. This is shown by the strategy of “level-shifting”: in many cases, naturalistic explanations do not seem to eliminate the rationality of nature that design arguments seek to explain, but merely push this rationality back to the level of more ultimate natural laws. However, it seems in principle possible that the evidence could also warrant belief in the existence of some naturalistically unexplainable gaps in natural history. The quality of the empirical evidence is the crucial thing to be evaluated, and the philosophical and theological arguments against the “God of the gaps” do not allow us to bypass this evaluation. So, the philosophical and theological critique of the God of the gaps is not as nearly strong as critiques of ID as is often assumed in the discussion.

The design arguments of natural theology have typically been theistic, concluding that there is evidence for the existence of a good God. In contrast, the ID movement argues merely for the existence of an unidentified “intelligent designer”. Nevertheless, for most participants of the debate, theism remains the most credible idea about the identity of the designer. Furthermore, many of the ideas of ID’s design arguments make much more sense in a theistic context. In ID’s cosmic design arguments, the beauty and the goodness of the natural order also play a part of the argument, which implies that the designer also must be good. ID’s biological design arguments, too, seem to assume at least an extremely wise designer. Because of the perceived theistic implications, it is reasonable to link ID’s design arguments to the traditional discussion of natural theology, even though the ID movement itself emphasizes the minimalistic nature of its argument.

The ID movement emphasizes the scientific nature of its argument and its difference from the arguments of natural theology, and it does indeed formulate its argument without the traditional religious context. However, it is not difficult to imagine that if the ID theorists did not see strategic benefits in this distinction, they would rather emphasize the continuity between ID’s designer and God, and openly make use of broader theistic arguments. It is clear, after all, that background beliefs about the philosophy of mind and the plausibility of theism greatly affect evaluations of design arguments.

ID’s Design Arguments in Relation to Creationism and the Natural Sciences

There are different narratives about Intelligent Design. Many critics present ID as a repackaged form of creationism, while the movement presents itself as a scientific research programme. I have argued that analysing the merit of ID’s arguments is of more interest than whether it should be classified as creationism or science. These definitions are semantic questions, and cannot settle the ontological questions that are the core issues of the debate.

However, the results of my analysis do also shed light on questions of definitions. On a very broad definition of creationism, ID is creationism, but on a sufficiently narrow definition, it is not. There is both substantial continuity and discontinuity between ID and

different forms of creationism. In any case, both empirical, philosophical, theological and moral arguments play a large role in the discussion on ID's design arguments.

The ID theorists principally defend a minimalistic design argument, in which the designer of biological and cosmic order is not identified. In the logical structure of the argument as it is presented by the movement, the separation between identifying the action of an unknown intelligent designer and identifying the designer does make sense. Furthermore, it can be argued that the same cognitive apparatus is in play both in recognizing human design and the designedness of nature. It seems ID's minimalistic design argument has analogies to the detection of the work of finite designers. This line of argument provides some grounds for claiming that ID is somehow analogous to sciences such as archeology, which also study evidence of design. The best objections to this argument are based on the differences between design-based explanations and the law-based explanations that are most commonly used in the natural sciences. The problem of defining the precise boundary between science and pseudoscience is a difficult one. Often, it is far easier to argue that a bad argument is bad science, than it is to argue that there is nothing scientific about it at all.

Because of the ID movement's emphasis on the scientific nature of its design argument, and because of the political importance of the definition of science, much energy has been used to debate whether ID indeed fits under the definition of science. The most common objections to ID as science are based on versions of methodological naturalism. I differentiated between strong methodological naturalism, which excludes any designers and supernatural entities from the natural sciences a priori, and weak methodological naturalism, which excludes such entities only based on an a posteriori evaluation of their scientific success.

ID's principal objection to strong methodological naturalism is that a priori methodological restrictions may not reflect the actual structure of reality. Before the examination of the empirical evidence, it is conceivable that an intelligent designer's activity beyond the laws of nature was required for the origin and evolution of life. If a designer's activity truly has been a crucial factor in natural history, then a science guided by strong methodological naturalism will never reach the true explanation of the origin of biological complexity.

The ID theorists express the same point theologically by emphasizing God's freedom in creation. Since God could have created in any way, it is up to empirical science to find out how he did it. God could have created the various living species through a process of evolution, or worked through miracles, for example. This principle of openness to the evidence is not restricted to the ID movement, but is part of the historical theological motivations of natural science, and a commonly used argument also in the theology and science community. The ID theorists apply the principle against strong methodological naturalism: God may not respect the boundaries of the sciences that have been set by humans. God may even have intruded into the territory of the natural sciences by directing the origin of life, for example. It is then argued that the natural sciences should be open to finding evidence of such a design act.

I have argued that this objection deserves to be taken seriously into account when defending methodological naturalism. However, methodological naturalism can be formulated in a non-dogmatic way which avoids ID's objections. The simplest way to respond is to restrict the domain of the natural sciences. On this understanding, the natural sciences do not have a monopoly on truth and rational beliefs. Rather, some questions are better characterized as part of other disciplines, such as history, psychology, philosophy and theology. In the theology and science community, it is commonly accepted that there is a hierarchy of scientific disciplines, and the natural sciences are not expected to answer all questions about the world. If the origin and evolution of life were indeed designed events, then a humble methodological naturalist can argue that the origin of life would no longer be part of the domain of the natural sciences. So, the boundaries of methodologically naturalistic science can be based on the evidence, rather than assumed dogmatically on a priori grounds.

Another way to respond to ID's objection is to defend merely weak methodological naturalism, and argue that ID is rejected based on the evidence, not a priori considerations. In the discussion on ID, several critics of ID have moved away from strong methodological naturalism, and have argued that something like ID could in principle be a part of the natural sciences. In this understanding, ID is critiqued based on the merits of its arguments, and the search for natural explanations is defended based on its historical scientific fruitfulness.

However, both of these credible ways of defending methodological naturalism concede the principal point that an evaluation of the arguments for and against ID cannot be evaded. It seems that it is possible to imagine a world in which it would be reasonable to believe in ID; it is just a matter of what sort of evidence we actually have. So, the crucial matter to be evaluated is the quality of the arguments, rather than which discipline they fall under. The question of whether ID qualifies as science or not is a side-issue.

The answer to the question of ID's scientific status is again likely to be more complex than a simple yes or no. Parts of ID's research programme (such as the evaluation of the plausibility of evolutionary mechanisms) clearly fall under even the strictest definitions of natural science, but others (such as the design argument) may be better construed as part of philosophy. If we accept the analogy between ID's design argument and the detection of human design, ID could also be called an integration of methods from the humanities and the natural sciences.

ID has sometimes been formulated as a theistic science, which eschews the ideal of scientific neutrality and seeks to understand nature starting from the assumption that God created the world. However, the ID movement's mainstream attempts to formulate ID as a methodologically neutral science, in which neither the existence nor non-existence of supernatural designers is assumed a priori. But perhaps it is even better to see ID as an attempt to integrate methods and ideas from various disciplines. If we go by the traditionally defined boundaries of disciplines, it becomes apparent that ID's project has both empirical, philosophical and theological parts.

In the course of this study, it has become clear that the ID movement's design argument has been formulated in dialogue and debate with opposing views. The nature of

ID's design argument will thus become clearer as I turn to my second research question: the relationship of ID to naturalistic evolutionism and theistic evolutionism.

10.2. ID and Naturalistic Evolutionism

Intelligent Design's Conflict with Naturalism

ID's approach in dialoguing with naturalism is to challenge naturalism on the level of the natural sciences, rather than on the level of philosophy and metaphysics, which the theology and science community has traditionally regarded as the better way to approach the issue. In the beginning of this study, I defined two forms of naturalistic evolutionism as (1) evolution without God and the supernatural, and (2) evolution which is seen as being in tension with important religious beliefs, or even evidence against the existence of God. ID is motivated in part by the desire to oppose this naturalistic understanding of evolution. The ID theorists argue that an intelligent designer explains the emergence of life, biological information and irreducible complexity better than naturalism, and that intelligent design is also the best explanation for many features of the cosmos. Furthermore, evidence of design is thought to support a theistic vision of the cosmos over an atheistic one.

The ID movement's design arguments have been formulated and refined in dialogue and debate with naturalism. In ID's argumentation, design and naturalistic explanations are thought to work at least to some extent on the same explanatory level. In both cosmic and biological design arguments, design is often opposed with naturalistic explanations. Naturalistic explanations for fine-tuning include both the multiverse hypothesis and references to hypothetical ultimate physical explanation for everything. These have been critiqued with several arguments, including (1) the alleged ad hoc nature of the multiverse hypothesis, (2) the consequences of the multiverse hypothesis in undermining our confidence in reason, (3) the greater explanatory power of the design hypothesis, because it also explains the intelligibility of the cosmos, (4) the consonance of the design hypothesis with further theistic arguments, and (5) "level-shifting", arguing that proposed naturalistic explanations do not actually solve the problem. The ID movement has used primarily the first three strategies, whereas theistic philosophers have used all five.

The ID movement's biological design arguments are based on the appearance of purposeful complexity or teleology in biology, which proponents of ID believe is particularly well exemplified by "irreducibly complex" systems. Irreducible complexity and the origin of life are thought to be the central problems for naturalistic explanations of all of biological complexity. I also detailed several other problems that have been used in the discussion, and revealed the interdependency of the arguments. My analysis of the problem of irreducible complexity (IC) revealed that much of the critical discussion has missed a crucial part of the argument. Biological homologies and the possibility of co-option are rightly reference as a possible answer to the problem of IC. Unfortunately typical discussions of the biological side of the debate ignore the fact that the IC-argument has also been formulated in a way that is meant to pose problems for the co-option -argument. These further arguments should be

taken more seriously in future discussions of ID. The importance of philosophical arguments for deciding how we should approach scientific mysteries cannot be bypassed.

Based on my analysis of the debate, it is clear that philosophical and theological arguments play a role in the strength of beliefs in both naturalistic explanations and design. This is partly because the scientific evidence is incomplete and many scientific mysteries remain, and partly because many of the questions of the debate are more philosophical and theological than scientific in nature.

On the naturalistic side, important arguments include (1) the critique of the “God/designer of the gaps” and the explanatory power of design, (2) defence of the superiority of naturalistic explanations over design-based ones, and (3) the problem of natural evil. All of these criticisms are repeated in the cases of both cosmic and biological design arguments, showcasing the similarity of the arguments, at least from a naturalistic perspective. This shows a link between the two types of design arguments. Particularly in the case of a priori -critiques, solving the problems in the case of one argument will often help answer critiques in the case of the other argument. However, the different evidential basis of each argument and the greater credibility of natural explanations in the case of biology also create important disanalogies between the arguments.

I have argued that the most plausible defences of naturalism against design arguments should begin by admitting that there can be no in-principle ban on design-based explanations. Methodological naturalism should be formulated in a self-critical and undogmatic way that allows for the in principle possibility of evidence for design. The preference for natural explanations should be justified based on their historical scientific fruitfulness, rather than a priori principles. At the same time, naturalists should acknowledge that the success of natural science also depends on the possibility of intentional explanations, and there is knowledge outside science. This leaves the door open for discussion of theistic arguments and dialogue between the various parties.

I have argued that it is reasonable to think that we could in principle have evidence of an intelligent designer of the cosmos. Eliminative naturalism is one way to reject this conclusion, but it is a highly problematic position that is not usually advocated by the naturalists in the ID discussion. So, rather than basing their arguments on principles which exclude any conceivable evidence of design a priori, naturalists should rather argue that our actual world only contains weak evidence of design, rather than strong evidence as the ID theorists claim. Furthermore, naturalists need to argue that design inferences are much stronger when we have background knowledge about the designer, and we lack such knowledge in the case of cosmic and biological design. Design arguments need to be shown to depend to a large degree on the broader theistic arguments. If the naturalist rejects all of these other arguments, she can then go on to argue that the evidence of design is also not convincing enough in the case of the natural order.

The Problem of Good and the Problem of Evil

Cosmic design arguments and biological design arguments are based (very broadly understood) on the phenomenon of natural good: the useful arrangements, rational ordering and beauty of the cosmos and living organisms. The rationality and the fine-tuning of nature in particular does seem to remain problematic for naturalism. In the final analysis, most of the naturalistic answers to cosmic design arguments seem to end up claiming simply that some of these puzzling features of nature cannot and need not be explained. Here theists are in a good position to argue that God may provide a better stopping point for the search of explanations.

However, naturalists can also appeal to the problem of natural evil as counterevidence to all theistic arguments. This is a more powerful response. The problem of natural evil points to the apparently useless and chaotic arrangements, bad design and the ugliness of the world as evidence against design. While proponents of cosmic design arguments argue that the cosmos is fine-tuned for life and rational, the problem of natural evil can be used to argue that our cosmos appears to be largely indifferent to the suffering of living beings. Rather than being the good world that one would expect based on a theistic design hypothesis, our world is argued to be mediocre at best. Against biological design arguments, it is argued that living things are in many places poorly designed and not the sort that one would expect from a wise and powerful designer, but are rather better explained by a haphazard, tinkering process of evolution.

Defenders of design arguments have responded to these criticisms in several ways – I provided a list of eleven different ways to answer the problem. However, there is a difference between theistic design arguments and the ID movement's design arguments which do not identify the designer. Theistic defences of the design argument are committed to the claim that the designer is good, whereas the ID movement's non-theistic design arguments do not identify the designer as God. Thus the ID theorists attempt to bypass discussion of the problem of natural evil on the grounds that it is not relevant to their argument. However, I have argued that the broader context of ID's design arguments should lead the ID theorists to also engage with the problem of natural evil in a deeper way. The credibility of ID's minimalistic design argument also depends partly on broader philosophical and theological issues, so the movement should engage these issues.

Based on the prominence of the problem of natural evil in critiques of the design arguments presented by proponents of ID and natural theologians, one might think that naturalists and believers in design are separated here by their degrees of optimism and pessimism. However, when they are not engaged in critiques of theistic arguments, the naturalists in the discussion also typically emphasize their awe at the marvellous designs and beauty they see in nature.

10.3. ID and Theistic Evolutionism

The Conflict Between ID and Theistic Evolutionism

Because a central aim of Intelligent Design is to oppose a naturalistic understanding of the world, ID would initially seem to have much in common with theistic evolutionism, since a theistic understanding of evolution is also opposed to naturalism. However, there is much tension between ID and theistic evolution. Whereas ID questions the veracity and sufficiency of Darwinian evolutionary theory as an explanation for all of life's complexity, theistic evolutionism attempts to harmonize the traditional Christian understanding of creation with mainstream naturalistic scientific theory.

Theistic evolutionists also use some of the same philosophical arguments against ID as naturalists. For example, ID is argued to introduce the concept of design improperly to the study of biological organisms, which should rather be studied by a methodologically naturalistic science. Theistic evolutionists' primary motivation for accepting Darwinian evolutionary theory comes from its status as a broadly accepted scientific theory. However, many theological arguments for preferring theistic evolutionists to an interventionistic understanding of divine action within natural history have also been presented. Three major arguments for this theological preference are first (1) that a theory of divine action harmonized with Darwinism makes explaining the existence of natural evil easier, second (2) that interventionism leads to an erroneous "God of the gaps"-theology where God is made into an explanation on the level of scientific theory, and third (3) that ID's picture of God as a designer is an anthropomorphic account which misrepresents the doctrine of creation and the doctrine of God. Sometimes it is even argued that ID comes close heresy.

These arguments are interesting, but inconclusive. Claims that ID is heretical overstate the case against ID, and would require that if ID's arguments were found to be correct, they would actually constitute evidence against the existence of the Christian God. In response to the first argument, the success of the Darwinian theodicy can be contested, and ID theorists can arguably also use a broad variety of strategies in responding to the problem of natural evil. In response to the second argument, it is difficult to present a good theological argument which totally rules out the possibility that God could have intervened in natural history. The abhorrence of God's miraculous interventions in the world often rests on the picture of God as a perfect watchmaker, but there are also other metaphors of God (such as the maker of a musical instrument) which are more congenial to even miraculous divine interaction with the world. It seems possible to formulate a theology which includes both the idea that God has created and upholds the order of nature, and that God works within nature in a way that goes beyond the laws of nature. In response to the third argument, the understanding of creation as the ordering of nature is arguably also a central part of the traditional doctrine of creation. There is thus a basis for speaking of God as a designer analogously. The critique of ID as idolatry comes close to the critique of all natural theology as idolatry, and proponents of ID could well utilise many of the responses that can be made on behalf of natural theology more generally.

It seems possible to conceive a world in which questions like the origin of life are indeed the proper limit of natural explanations, just as theistic evolutionists conceive of the explanation of cosmic fine-tuning and the rationality of the cosmos as a properly beyond the capacity of the natural sciences to explain. God could have created the world in a way that does not respect the traditional division of tasks between theology and the natural sciences. In the theology and science community, it is broadly accepted that God's creative acts are free and we need empirical research to find out what sort of world God did create. Applying this thinking to the question of ID means that theistic evolutionists should primarily also use the empirical evidence against ID, rather than depending too heavily on theological arguments. Of course, theological arguments can continue to be used to show why theological explanations are more at home in the level of metaphysics, rather than the natural sciences. Theological arguments can also continue to be used to show the compatibility of evolution and creation, and to point out tensions in ID's theological argumentation.

Problems in ID's Critique of Theistic Evolutionism

Classical Christian theology admits the possibility that God could have intervened into history beyond the laws of nature. This makes it theologically difficult to rule out the possibility of divine interventions into history a priori, without looking at the evidence. However, the classical doctrine of creation is indeed more about the ultimate basis of reality rather than being a theory in competition with some scientific theory. Thus the ID theorists can be argued to err by emphasizing the comparison between design and evolutionary theory as explanations. So, the theological critique of God of the gaps does provide an important warning against too heavy an emphasis on God's direct activity in natural history beyond the secondary causes of nature. The theological critique of idolatry also contains a useful warning. Talk of God as a designer must also admit that God is more than a designer, and the doctrine of creation should be understood to be about far more than design. The ID theorists emphasize only the aspect of God as a designer, and sometimes create the impression that God's activity could not be detected without gaps in natural processes. This is puzzling, since the ID theorists also believe that the laws of nature are designed.

The ID theorists' critique of theistic evolutionism is problematic and in tension with the movement's broader ideas. While the ID movement admits the possibility that God could have created life through some sort of evolutionary process, it also understands Darwinian evolution as a worldview that is by definition atheistic. It seems to me that the ID theorists do not adequately respond to the arguments for separating between Darwinian evolutionary biology as a scientific discipline and Darwinism as a worldview. Here the views of the ID theorists even come close to scientism, because they argue that theistic evolutionism should differ from the Darwinian worldview on the level of science, before it can differ in any meaningful way. The ID theorists would do well to admit the value of philosophical and theological arguments in this discussion more clearly, as they do elsewhere. Furthermore, as implied by their argument from divine freedom, God could have used the process of

Darwinian evolution in creating life, and it is up to empirical science to find out what happened. The admission of the possibility of theistic evolutionism would help create a theologically more secure basis for ID and help quell the suspicion that ID is strongly driven by theological motivations.

In the course of my analysis of ID's biological design arguments, I have provided some novel thoughts towards the reconciliation of biological design arguments and Darwinian evolutionary biology. Surprisingly, I have found some inspiration for this line of argument from the ID theorists' writings, despite the ID movement's own dismissal of the combination of Darwinism and design. Critiques of Darwinism can be turned into illustrations of the amount of fine-tuning which Darwinian evolution requires to work, and arguments on the necessity of design for the functioning of simulations of evolution show how the possibility of evolution depends on the existence of proper conditions. Furthermore, I have argued that biological organisms could function as icons through which the fine-tuning of nature becomes most clearly manifest, and so by extension the designedness of the universe can be perceived through organisms, even in a evolutionary cosmos. These arguments require much further work, but my opinion is that they point towards the possibility for movement from ID to a theistic evolutionistic view without sacrificing belief in biological design.

10.4. Towards Better Discussion of Evolution and Creation

I began this study by referring to the wide-spread intuition that the order of nature somehow testifies of the existence, power and wisdom of a Creator. The useful arrangements, rational ordering and beauty of nature can be understood as a "problem of natural good" for naturalistic atheism. If there is no Creator, then why is there so much good in the world? The discussion on design arguments shows the complexity of this question, but also its potential. Though the focus of this study has been on understanding rather than on evaluating the design argument, it does seem that the argument can be formulated in a way that bypasses many common objections. In my analysis, I have pointed out responses to many philosophical and theological critiques of design arguments.

However, the ID movement's arguments also have problems. In particular, ID's way of opposing design and Darwinism and its unwillingness to openly connect its argument with its broader philosophical and theological context are problematic. On many points, the ID theorists' argument is weaker than it could be because of the movement's lack of engagement with a more robust Christian theism and classical theology of creation. My analysis reveals that major positions in the ID debate are based not just on scientific evidence, but also on philosophy and theology. For maximal academic and cultural benefits, the debate should be openly conducted on all of these levels.

In my analysis of the cognitive terrain of the discussion on Intelligent Design, I have gone through a large amount of material and identified much that is crucial for understanding the ID movement's design argument and the relationship of ID to naturalism and theistic evolutionism. But there also remains much that can be studied further. First (1), based on this mapping of the cognitive terrain of the debate, a full evaluation of the ID

movement's research programme could be conducted. This would require a much more in-depth analysis of the scientific evidence, as well as the nature of science and evidence. Bayesian analysis could be used to provide much better estimates of what, exactly, is the impact of different background beliefs on the credibility of design arguments. Second (2), the theological and moral argumentation of the ID theorists and their critics that are not directly related to the design argument could be further analysed. The moral, psychological, social and political aspects of the debate are highly intriguing, and could serve as an interesting case study of human nature and the ethics of living in a world of such fundamental disagreements. Third (3), I would like to be able to formulate a theological understanding of nature incorporating the idea of design in nature and "the problem of natural good" into a proper theology of nature, taking into account the theological and philosophical problems identified in this study. This type of a theology of nature would argue that the order of nature has properties that help make talk of a Creator intelligible, just as the question "Why is there something rather than nothing?" is often conceived to do.

This has been a study of the Intelligent Design movement's design argument and its theology as it relates to the design argument. Looking back on this study, I am amazed at the multitude of connections between the design argument and other long-standing issues in the philosophy of science, the philosophy of religion and theology. My analysis of Intelligent Design has touched on problems like the relationship of faith, reason and science, the problem of natural evil, the nature of reality and the nature of God. For me, this revelation of the breadth of the factors behind the debate on design arguments has been the one of the greatest rewards of this study.

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