

LIBERTY UNIVERSITY RAWLINGS SCHOOL OF DIVINITY

TRACING GOD'S HAND IN REDEMPTION: EXPLORING EVIDENCE OF THE *IMAGO
DEI* IN HUMAN MOLECULAR BIOLOGY

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ABSTRACT

This interdisciplinary dissertation examines how *Imago Dei* and the impacts and redemption of sin may be observable in molecular biology. It introduces the idea of biological redemption, where, in support of our *Imago Dei* mission and calling, our bodies can respond to environmental and spiritual factors with biological redemptive adaptations. This project does both theological and scientific assessment. It explores how God is engaged with individuals in community via spiritual social networks, where Christian communities act as an ecosystem in which individuals can thrive and undergo spiritual formation, living out Christian spiritual practices. The main question this dissertation addresses is: what evidence exists in human molecular biology that demonstrates God's redemption in a spiritual community through to dependence on the Lord?

This dissertation addresses this question by exploring three areas. First, it considers the theology of creation, focusing on the anthropology of man and the *Imago Dei*. Second, it examines man in community, looking at our spiritual social networks. This is done by looking at key biblical and early church champions and how they transformed God's world. By using the term champion, the intent is to convey how individuals influence their network with an idea or innovation. This historical science review shows that man is made to interdependently thrive in a networked, supportive spiritual ecosystem. Man is intended to operate in a networked spiritual community or ecosystem as God does in the Trinity. Third, it analyzes how God's plan for redemption from the effects of sin can be seen in molecular biology. Using genome wide association study (GWAS) data, molecular biological insights about alcohol metabolism is done, analyzing genetic and epigenetic adaptation of the enzyme called *alcohol dehydrogenase* (ADH). Through also looking at various published literature it also examines the impact of

environmental and spiritual factors on alcohol use, abuse, and recovery. This project offers a distinctive and creative way of thinking about spiritual formation and positive Christian spiritual influence within a socio-spiritual ecology. In terms of application with these assumptions, a theologically informed researcher may have an advantage in uncovering new insights into nature. God has designed multi-level mechanisms for the redemption in creation and has laid out a plan for redemption, which can be uncovered through examining evidence in creation.

SUMMARY

This dissertation discusses our *Imago Dei* mission and calling and surveys how that mission was accomplished in the lives of Biblical and early church innovation champions. This dissertation shows how one's *Imago Dei* calling is enhanced by being in a supportive spiritual community that helps spiritual formation, and how that calling is sustained by a resilient human body that, even in a fallen state, shows evidence of redemptive adaptation. The concept of biological redemption is developed to describe the redemptive adaptation a human body is capable of performing. Direct biological redemption takes place by the way human bodies are designed. Indirect biological redemption occurs as a result of spiritual formation activity and supportive spiritual community involvement. Indirect biological redemption is demonstrated through looking at alcohol metabolism and substance abuse, examining the biological impact of experiencing spiritual awakenings. Epigenetic adaptation, the process by which gene function is turned on or off, can take place in the ADH gene region associated with alcohol metabolism. The molecular biological assessment in this dissertation flagged the SNP RS1229984 in the ADH1B gene from the ADH gene region and shows how epigenetic adaptation could occur with the most common allele case.

CHAPTER 1: INTRODUCTION AND OVERVIEW

Overview Summary

This dissertation discusses our *Imago Dei* mission and calling and surveys how that mission was accomplished in the lives of Biblical and early church innovation champions. This dissertation shows how one's *Imago Dei* calling is enhanced by being in a supportive spiritual community that helps spiritual formation, and how that calling is sustained by a resilient human body that, even in a fallen state, shows evidence of redemptive adaptation. The concept of biological redemption is developed to describe the redemptive adaptation a human body is capable of performing. Direct biological redemption takes place by the way human bodies are designed. Indirect biological redemption occurs as a result of spiritual formation activity and supportive spiritual community involvement. Indirect biological redemption is demonstrated through looking at alcohol metabolism and substance abuse, examining the biological impact of experiencing spiritual awakenings. Epigenetic adaptation, the process by which gene function is turned on or off, can take place in the ADH gene region associated with alcohol metabolism. The molecular biological assessment in this dissertation flagged the SNP RS1229984 in the ADH1B gene from the ADH gene region and shows how epigenetic adaptation could occur with the most common allele case.

Introduction

This interdisciplinary dissertation examines how evidence of the *Imago Dei* and sin is observed in biology. It introduces the idea of biological redemption, where, in support of man's *Imago Dei* mission and calling, human bodies can respond to environmental and spiritual factors with biological redemptive adaptations. This project explores possible links between theology and the scientific assessment of nature. It examines how God is actively engaged with

individuals in a networked community via spiritual social networking and spiritual formation. Three domain areas are considered: (1) theology, and more specifically the systematic loci related to anthropology, soteriology, theology proper, creation, the divine decrees, and blessings and curses; (2) Christian network and community (spiritual social networking) and spiritual formation, or more specifically, the application of ecclesiology, ecology and ecosystems, network theory, sociology, psychology, history, and Christian online education; and (3) science, including the philosophy of science, biology, genetics, and epigenetics. Each of these areas are key to understanding and interpreting human biology. Each of these three areas leverage concepts from the other areas, and this is done by first developing points in each area independently, and then in synthesis to support the research purpose questions.

Acknowledging the bias and presuppositions that every individual has, while I hold to a conservative evangelical theological world view, I also have a high regard for science and the integration of these domains of knowledge. Therefore, various points of view are included in this project, and my goal is to adequately and accurately represent those points of view while also suggesting how their epistemic contributions tie into the themes examined here.

What is the *Imago Dei*? *Imago Dei* is the Latin phrase for image of God. As originally conceived in Gen 1:26, it refers to the unique imprint God placed upon man, setting man apart within creation. Theologians differ about what precisely this means and how one should interpret it, but some major themes from their arguments are useful to capture for the research purpose of this project. If man is created in the image of God, what does that imply about man's ontology, and how can one see evidence of the nature of man and his calling played out in biological life? Is there evidence of God's intentionality at a "higher design" level that is also observable all the

way down to a molecular biological level? Evidence suggest there are multiple layers of design in human biology, which is illustrated in Figure 10.

This dissertation examines how human molecular biological evidence corresponds with the concept of *Imago Dei* and God's design for restoration in a supportive spiritual community. It does this by exploring three areas. In three areas, this dissertation's research points out how characteristics of God's nature are reflected in individuals who are created to be in community and where the results of engaging in spiritual and healthy activities promote redemption and restoration. Therefore, I will first examine the theology of creation and the concept of the *Imago Dei*. Second, I will explore spiritual social networking by looking at key biblical and early church champions and how they transformed God's world. By using the term *champion*, the intent is to convey how an individual can influence his or her network with an idea or innovation and be considered an innovation champion, which I will develop later. These champions transformed the world by acting upon their *Imago Dei* calling. This dissertation shows how man is made to interdependently thrive in a networked, supportive spiritual ecosystem. Finally, I explore how God's purposes for the *Imago Dei*, His divine signatures, and redemptive work may be seen human molecular biology through the example of alcohol metabolism.

Three outcomes of this investigation are examined: (1) God's intentions, theological directions, and imperatives that are conveyed in humankind's the *Imago Dei* calling, (2) the impacts of man's interdependent relationships in a networked community ecosystem and how this system reflects relational aspects within God in His triune nature, and (3) more robust understanding that better interpret the molecular biological signatures and interpretations that may show how the *Imago Dei* is seen in biology. These outcomes may show how biology

responds to God's mission given to mankind by the *Imago Dei* and the benefits from being in community. Both of these reflect aspects of the nature of God.

One goal of this project is to offer a distinct and creative way of thinking about spiritual formation, positive spiritual influences, and operating productively within a socio-spiritual ecology in light of the *Imago Dei* calling and man's mission. Therefore, I argue that a theologically-informed mind will have a better vantage point to observe and understand nature with the implications from man's *Imago Dei* mission and calling than a mind only using empirical data and methodological naturalism.

God, having committed Himself to active engagement in the affairs of humankind upon the act of creation, has left identifiable signatures of His design in multiple levels of creation, many of which act as mechanisms of redemption. This premeditated activity of God can be seen in all aspects of nature since the beginning when God created space and time. Thus, it will be shown that in any part of God's creation, one sees God's signature and an incredible record of His good pleasure in creating a purpose-filled world. If man is God's crowning achievement in creation, then there should be ample research areas to consider regarding how man is, indeed, fearfully and wonderfully made.

Mankind, reflecting the indwelling nature of the Triune God, is designed to operate in a communal ecosystem, interdependently working and living together as a unit. Therefore, God's handiwork can be traced throughout biology. God uses community environments to guide and shape His children. Through divine intervention and God's commitment to redemption, active prayer, the support of a Christian spiritual network, and the practice of faith and spiritual formation, one can cope with the challenges one faces in life. A case study of alcohol abuse and

recovery will act as a specific example of God's work in and through biological processes, particularly through genetic and epigenetic examination.

My motivation for focusing on this topic is a fascination with what I consider to be the observable evidence in nature that aligns with theological reflections on God's intention and design for the world—for natural imprints of the *Imago Dei*. Strict adherence to methodological naturalism does not adequately capture the impact of processes like epigenetic adaptation (i.e. biology's ability to adapt to its environment, which will be explained more in-depth later) that aligns with a biblical understanding of restoration and redemption. The line of reasoning captured in this approach can inspire specific threads for analysis, to include an exploration for what God intends mankind to uncover in the biological evidence. If God designed nature to be discoverable, there should be many things one can learn and reflect on from nature.

There are greater insights into the nature of reality and observable evidence in nature. Focusing only on what can be seen empirically causes one to deal with what is explicitly knowable. This explicate level of observable evidence is interesting, but it can leave one unsatisfied that this fully captures the extent of what one experiences is there. Consider awe-inspiring experiences with nature, the harmony found in biological life forms, or astronomical spectacles in the skies. One wants to consider things beyond the data and ponder implicit elements at the implicate level. As is revealed by knowledge at the implicate order level, which consists of looking at a deeper level of reality, by including theological knowledge and insight into the analysis and explanation of data, one has a better chance at seeing the big picture and more accurately understanding molecular biological order. As will be discussed later, implicate order refers to the meaning that can be found in evidence that is indirectly derived by looking at it holistically. This takes place in forming abductive arguments, which deals with the formation

of an argument by considering what our minds tend to gravitate towards, order, beauty, and harmony. As a result, one gravitates towards aesthetically pleasing things and tend to seek out a sense of the deeper implicate reality one sees in the natural world.

Research Question

If human beings are image bearers of God who struggle with sin and the impacts of sin nature, then the main research problem is this: *Can one, by looking at scientific and anthropological data with a theologically-informed perspective, identify evidence that shows God's redemption?* More focused research questions can be grouped into three sub-areas that align with the three research areas addressed above. The dissertation research offers additional insight by addressing the following more detailed questions:

- **Theological:** What are the anthropological implications that emerge from examining various theological understandings of the *Imago Dei* and the effects of sin on the human person? How are the reflections of God's attributes within creation and man's role as God's image bearer known? What are God's purposes for creation? How is God's plan for redemption seen in creation?
- **Spiritual Social Networks:** From a history of science (including Pannenberg's historical science) perspective, what happens when there are God - person encounters? What evidence is seen in the lives of specific individuals in biblical and early church accounts? What common characteristics can be seen in these encounters? How are the individuals influenced by their spiritual community? What influence do they have on others in the church, in their spiritual formation, and the outcomes of living within a supportive spiritual ecosystem?
- **Science and Creation:** Is there biological evidence of *Imago Dei*? What impact does faith have on our biology? Can one trace the impact of spiritual activity in our molecular biological self? Using alcoholism as a specific case study, what biological evidence demonstrates that God can intervene in the recovery and reformation of the individual, biologically, socially, and spiritually?

Topic Overview and Research Gap

This project examines productive ways for theology to directly inform researchers as they do scientific research. God tells us that when one asks, and He will answer. Although there is a specific context to any passage in Scripture, there is a universal truth regarding accessibility to

God that one sees when in Jeremiah God says to His people, “Call upon me and I will tell you great and mighty things you do not know” (Jer. 33:3). This project will therefore use an interdisciplinary model to examine who God is and what kind of insight one can draw from biology when considering perspectives from several other disciplines like theology and anthropology. God’s character can be seen in different ways within each discipline. Even more can be seen when considering two or more disciplines together.

In order to build upon already published scholarly literature, CHAPTER 2: PRECEDENTS IN THE LITERATURE contains thematic summaries of current thought on the three fundamental areas in the dissertation. The following highlights the current state of what is published in the literature in these three disciplines.

- As Christians, biblical and systematic theology and the study of God should influence everything one does. Scripture is the relevant starting point, and good exegetical work develops that point. From there systematic theology can incorporate the best of philosophical thinking to engage the best current science. With this foundation of biblical and systematic theology one can then construct new theologies in various areas, applying what one knows of God and His working in the world for specific application. This is a traditional task of practical theology as God wants us to apply revealed knowledge to specific cultural conditions. A theology of creation will thus be formulated for these purposes.
- Social networks are actively being studied today. God’s active engagement with human persons has taken place since the creation of humankind. Each encounter with God is fascinating but drawing together key biblical examples and along with the lives of early church leaders to characterize the common elements they share has not been done. With the advent of electronic social networking sites, there are interesting bodies of work that can be leveraged to draw conclusions about how human beings are social in nature and long to have community and connection.
- There are major advances taking place in the areas of biology, genetics, and epigenetics. Studies are mapping biological functions to specific areas of our human genome, like in the area of alcohol metabolism, which is explored in this project. There are effective methods and tools in molecular biology, genetics, and epigenetics for mapping out operational functions. These will be demonstrated by looking at alcohol metabolism and epigenetic adaptation as a result of various influences including spirituality, support networks, and other environmental factors.

Thus, while there is abundant scholarship to be leveraged from (1) theology, (2) social network analysis and spiritual formation, and (3) molecular biology, genetics, and epigenetics, unfortunately, there have been no attempts to look at them together in a holistic manner. In particular, there is limited literature suggesting how theology, anthropology, and being in the *Imago Dei* may provide people with insight that would be advantageous for scientific research, experimental design, and especially data interpretation. This project explores this gap by analyzing God's decrees, His intentions for creation, and how human beings are designed to operate in an ecosystem or social network. It then explores how these three factors mentioned above are observable in our genetic makeup and even influence our behavior. If God conserves (*conservatio*) and governs (*gubernatio*) the natural world, then there is likely a higher than the natural world order where it is possible to reprogram or override aspects of gene function through a process like epigenetic change. From a theological perspective, this suggests there is an implicate order that should be explored which will be developed later in this dissertation.

For example, a research driver is trying to better understand an aspect of the theology of creation by focusing on the *Imago Dei*. How does the *Imago Dei* impact operation in an ecosystem or social network? For a specific test area, alcohol metabolism, where might the impact of *Imago Dei* align with observables from molecular biology and influence behavior, perhaps epigenetically? As our molecular biological understanding improves, so does one's ability to discover and understand God's "design patterns," where perhaps it is possible to reprogram or override degraded portions of biological function from the impacts of sin and the fall in order to better equip people for their *Imago Dei* calling.

Hypothesis and Approach

This project's hypothesis is as follows: there is anthropological, historical, and biological

evidence for the *Imago Dei*. It suggests that aspects of God's design and redemptive intentions in creation are discoverable for human beings. An explicit explanation of empirical biological data is not adequate to cover the degree of what the findings suggests, necessitating explanations via implicate order. The nature of alcohol metabolism and abuse, along with the supporting molecular biological, genetic, and epigenetic evidence, exemplifies the need to include arguments for implicate order to explain the biological design features that address the redemption dynamic.

The dissertation assessment approach is threefold: (1) Do a theological assessment to explore a theology of creation and an anthropological examination of *Imago Dei*. This assessment will help answer the question, "What does divine (both general and special) revelation inform us should be look for in biology?" It will also look at biblical individuals and how God intervenes within them and in their community; (2) examine the phenomena of spiritual formation development in community, answering the question, "How do innovation champion participate in the intentions of God?"; and (3) examine a scientific research arc, inspired by the implications of the *Imago Dei*, focusing on alcohol metabolism and its relationship with genetic, epigenetic, and spiritual restoration components. What signatures, if any, can be seen in the psycho-somatic processes? What cause-and-effect relationships can be identified in genetic signatures that align with God's intentions in the *Imago Dei*?

Does a theologically-informed researcher have a greater chance of successfully recognizing and uncovering certain design pattern categories in nature than one who does not consider this information? There is an interesting opportunity to examine the influence of God the Designer in creation and whether there is evidence that God is working through individuals in the midst of their spiritual social network. By examining scientific evidence with this in mind,

additional research questions can be formulated that might result in new findings and perhaps complimentary insights that show God's design and intervention in the lives of individuals.

Methodology

Instead of using an epistemological dualistic approach that separates scientific evidence from other forms of knowledge, an approach that is common in current science since empirical data is considered the only source of knowledge, this dissertation integrates various sources of knowledge, leveraging natural, supernatural, and metaphysical sources of truth. It draws from three disciplines (theology, sociology, and genetics) and forms conclusions based on information derived from theology, network analysis (sociology), and common scientific tools for genetics and bioinformatic analysis. One goal of this project is to explore how theology can sharpen one's understanding of certain aspects of biology. In the molecular biology assessment, the possible pathway connecting genetics, epigenetics, and the spiritual is considered. A separate section will also identify possible problems that might result from incorporating a theological worldview into natural scientific endeavors.

In CHAPTER 3: METHODOLOGY, this dissertation's assessment basis and methodological framework for comparing alternative hypotheses to what is explored in this dissertation. Two competing models are (1) methodological naturalism, which uses an epistemological dualistic paradigm that separates the scientific and theological domains, and (2) Christocentric theologically-informed research with an epistemological basis that integrates supernatural and natural sources of knowledge. The three thematic focus areas of theology, sociology, and genetics are analyzed, developed, and then evaluated in an integrated synthesis in CHAPTER 4: ANALYSIS AND SYNTHESIS.

Theological Basis for Creation, Restoration, and Redemption

As Carl Henry strongly argues, divine authority and revelation are the key places to start to form a theology of creation, restoration, and redemption.¹ The section “Insights from Scripture” will argue that the Bible has a great deal to say about creation, God’s interests in man, and His redemption of fallen nature.

A robust spiritual ecosystem that trusts in the integrity of Scripture provides a variety of benefits. A supportive network inspires the best in individuals through the work of innovation champions (as introduced earlier and will be expanded upon later). A supportive spiritual network creates a robust network that promotes truth and wholeness. It enables supportive connections for redemption, restoration, and growth. On the flip side, a non-supportive community network or otherwise negative community has the opposite effect. It can promote pursuits of pejorative type behavior and focuses on self-benefit rather than the benefit of the community.

God created man and put him in the Garden of Eden. My hypothesis suggests that Eden provided optimized initial conditions for man to flourish. This is also where the mission of man being an image bearer of God was given. As one studies nature, one should see evidence of this design at multiple levels of biological creation, even down to the molecular biological level. At the beginning of creation, mankind had free access to God; man could eat from the Tree of Life. There was harmony and meaningful relationships between God and man, man and woman, man and nature, and within man himself. Man was created to be in community. This started with God, and expanded to the human community God set up. Man thrives in a community ecology that reflects the Trinity through mutual interdependence between the members. As individuals form a

¹ Carl Henry, *God, Revelation and Authority, Vol. 1* (Wheaton, IL: Crossway Books, 1999), 195-196.

complete ecosystem, they feed and help each other to be all that God wants them to be and thus become truly human.

Transcendent Redemptive Story: Three Domains Where Man Meets God

Since this dissertation is addressing complicated information in three different disciplines, there will be an attempt to relate all three and show how they fit into a unified theme or narrative, which is part of the redemptive story God shares with mankind. This will include an ongoing dialogue about the implications of the *Imago Dei* and the consequences of sin. The goal is not to get lost in the amazing details of multiple layers of design in the biological world, but to stay connected to God's redemptive story and transcend to a higher understanding of the meaning that is contained in the details, and to seek out the greater purposes in man's *Imago Dei* mission that have been revealed through Divine revelation. Therefore, this project purposefully acknowledges God's desire to be known.

One can experience a sense of the transcendent redemptive story and a yearning for a deeper understanding and connection to the things of God at all levels. For example, one knows God from His Word, when one experiences the incarnate Word of God and biblical truth in community. One experiences God in networked community and through the majesty of His creation, when one witnesses the holistic interrelatedness of special revelation, social relation, and natural creation. There is a theme of God's redemption throughout all of life, or a silver lining that shows God's desire for redemption and returning individuals to a more meaningful connection with Him. This story is included in this dissertation and is captured in three main points. First, God created the heavens and the earth. God has created an environment that is designed to function as a supportive environment for human beings to connect and walk with Him, to be in community and not alone, to do the creative work He empowers people to do, to

meet ongoing needs of both man and all of creation, and to bring man into restored relationship through redemption. Second, man is designed to be part of an ecosystem. The support of a spiritual network creates an environment that builds up, nurtures, and educates individuals. Third, one should find evidence in human molecular biology that supports creation design and points people's ability to change physically, e.g. via epigenetic adaptation through the power of God.

The implications of God's redemptive story and a distilled summary of the value for the research done in this dissertation is summarized in CHAPTER 6: CONCLUSIONS, IMPLICATIONS, AND FUTURE RESEARCH. There is plenty more to be done along the thematic lines that are introduced in this dissertation.

CHAPTER 2: PRECEDENTS IN THE LITERATURE

Overview

This chapter summarizes the relevant theological and scientific literature review. There is a section for each of the three major parts of the dissertation: (1) theologies of creation, particularly views on the *Imago Dei* and its anthropological significance, (2) research on spiritual social networks, and (3) data from molecular biology, genetics, and epigenetics dealing with alcohol metabolism.

PART 1: Theology of Creation, the *Imago Dei*, and Its Anthropological Significance

Introduction

This section introduces key lines of thought that will be used later in the work as the dissertation assessment in CHAPTER 4: ANALYSIS AND SYNTHESIS. In order to be mindful of the range of scholarly opinions, theologians ranging from liberal to conservative are

considered in the analysis section. This includes theological assessment from an atheistic perspective. Conservative evangelical scholars tend to hold to more strictly to a classical interpretations of the *Imago Dei* and the reality of sin. Put simply, Genesis states that on the sixth day of creation, God dedicated the day for the creation of man and woman *de novo*, stating that mankind was created in the image of God. In this creative act, God created man and woman and place them in the garden of Eden. Liberal scholarship has questioned whether or not there actually was a real garden of Eden. Still, others have persisted in reading the Genesis story within the genre of historical narrative and thus relating, minimally, some core truths about historical events and places. Regardless where one falls in this spectrum, all acknowledge the utility of the *Imago Dei* concept and its precepts in the Christian religion.

The Appendix contains additional theological material and molecular biological data that are useful to include but were not critical for the main discussion in the dissertation. The theological section surveys a number of Scripture verses and provides scriptural insights on key topical areas along with some reflection on God's intentions for creation.

Precedents for *Imago Dei* and Sin

Imago Dei and the reality of sin are two significant theological anthropological issues that are generally agreed upon by many scholars from a diverse range of theological positions as foundational to Christianity. Each position has been investigated from a wide variety of theological perspectives. In order to address the range in modern theological scholarship, perspectives from the following seven contemporary theologians on the *Imago Dei* and sin will be assessed. The precedents their views represent are introduced here and are then used in part of the analysis section in the next chapter. This group of theologians is composed of an atheist theologian, a continental scholar, a Catholic pope, two systematic theologians, a bioethics

theologian, and an Old Testament scholar.

Each theologian will be introduced in more detail, but a brief discussion of each with his respective main points is introduced here. First, LeRon Shults is a theologian and atheist who argues for an atheistic iconoclastic theology. As he developed academically, he decided to move away from a faith position and became an atheist. He rejects the centrality of the *Imago Dei*, the fall, and the reality of sin. Second, Wolfhart Pannenberg, an accomplished German Lutheran continental philosophy scholar and theologian, argues that although anthropological theology is no longer bound by Biblical dogma, historically it is still beneficial to talk about the *Imago Dei* in order to properly understand man in nature. One can gain anthropological insight about the *Imago Dei* through historical science and human biology. Third, Pope John Paul II, a Catholic leader who was instrumental in the Catholic Church's work in Vatican II, holds to the integrity of the *Imago Dei* and the real impacts of sin in the world and on creation. He also sees the body as an important theological component since the Word became flesh and dwelt among us. The implications of both sin and redemption of the human body must be considered. Fourth is John Frame, a reformed systematic theologian who argues for a traditional view of the Image Dei. Fifth is Wayne Grudem, a conservative evangelical systematic theologian who also agrees with the traditional view of the *Imago Dei* and its signification of man's likeness to God, our role of representing God, and the destructive nature of sin and the fall. Sixth is John Kilner, a theologian and professor of bioethics who advocates for the high value and mission of mankind given the mission of the *Imago Dei* calling and its ethical implications. Seventh is Richard Middleton, an Old Testament scholar who argues for understanding the *Imago Dei* within the Ancient Near East context of the author of Genesis. Middleton points out the value of the body when examining the *Imago Dei* from Old Testament scholarship (and not just Systematic Theological

scholarship). He argues that the body is often missed in theological considerations of the *Imago Dei*, even though the vitality of the body is a component of spirituality and supporting of man's *Imago Dei* calling.

According to Shults, man is not made in the image of God (*Imago Dei*), nor is sin real, as the Bible and tradition suggest. Rather, from a merely historical and literary point of view, Shults acknowledges the Christian model that is used for creation and redemption. Attempting to understand this model and its moral ramifications, Shults suggests how the importance of the image of God ideal became central in the formation of Christianity:

The basic thrust of the entire New Testament is that Christ is the one true image (icon) of the one true transcendent moralistic Entity, the only mediator between humanity and the supernatural Agent he called "Father." During the rise and eventual dominance of what is now called "Neo-Platonism" during the third and fourth centuries after Jesus' death, the notion of Christ as the image of God became even more important.²

Pannenberg, however, suggests history can be viewed as revelation, or what he calls "universal history" (*Universalgeschichte*, which can be thought of as a universal history narrative), which entails a complicated understanding of inspiration where Scripture is seen as "from below," but with some influence "from above."³ Pannenberg summarizes his agreement with the centrality of the two themes of historical science and human biology below, using his modern intellectual neo-orthodoxy and critical focus, as he discusses theological perspectives in anthropology:

Dogmatic anthropology has had two central themes: the image of God in human beings, and human sin. Also discussed have been the relation of soul and body, as well as a series of other questions for the most part connected with the soul-body question, but these have not been the specifically dogmatic themes in the theological doctrine of the human

² LeRon Shults, *Iconoclastic Theology: Gilles Deleuze and the Secretion of Atheism*, (Edinburgh: Edinburgh University Press, 2014), 32.

³ Philip Clayton, "Wolfgang Pannenberg – In Memoriam," *Patheos, Theology*, The Tony Jones Blog at Patheos, accessed March 9, 2019, <https://www.patheos.com/blogs/tonyjones/2014/09/07/wolfgang-pannenberg-1928-2014/>.

person. The two main anthropological themes of theology—the image of God and sin—will also prove to be central in the attempted theological interpretation of the implications of nontheological anthropological study.⁴

Pannenberg argues that the two disciplines required to do effective human anthropological examination are human biology and historical science. Human biology can be thought of as a bottom-up approach while historical science can be thought of as a top-down approach. Human biology examines the characteristics of a species and can also provide insight into individual characteristics when one considers molecular biology. Historical science provides a means to reflect back on how individuals have acted and how culture has been shaped. It examines the evidence of specific individuals and the way they interact in their own history.⁵

There are differences in opinions about what the *Imago Dei* and sin imply, including some at fundamental levels for more liberal scholars. The goal for this dissertation is to start with a minimum facts basis that shows a consensus of opinion from the academy. Concerning the *Imago Dei* Pannenberg suggests one can achieve an understanding of the image of God and sin by looking at the facts that are knowable by an anthropological evaluation. This understanding is important for the theological development portion of this project. Pannenberg, performing a historiographical assessment of the Genesis 1-3 text, shows the centrality of the historical science and human biology from the earliest Pentateuchal writings. Their significance of the *Imago Dei* and the reality of sin is agreed upon within all three monotheistic religions: Christianity, Judaism, and Islam.

In the early years of his papacy, Pope John Paul II gave 129 lectures on the theology of the body. The compilation of these, *The Redemption of the Body and Sacramentality of*

⁴ Wolfhart Pannenberg, *Anthropology in Theological Perspective* (New York: T&T Clark, 1985), 20.

⁵ Wolfhart Pannenberg, *Anthropology in Theological Perspective*, 21–22.

Marriage, touches deeply on *Imago Dei* and the impact of sin. In these sermons, John Paul II acknowledges the utility of considering the body theologically to provide greater understanding of how human bodies are a part of individual identity, and how one cannot be completely human without considering what the body contributes. He reflects on the Incarnation and the body:

The fact that theology also considers the body should not astonish or surprise anyone who is aware of the mystery and reality of the Incarnation. Theology is that science whose subject is divinity. Through the fact that the Word of God became flesh, the body entered theology through the main door. The Incarnation and the redemption that springs from it became also the definitive source of the sacramentality of marriage, which we will deal with at greater length in due time (Wednesday Audience on April 2, 1980).⁶

However, in spite of this centrality of the *Imago Dei* and the body, John Frame in his book *Systematic Theology* summarizes the difficulty in establishing what constitutes the image of God. He goes on to discuss the key roles individuals have as a part of bearing the image of God, a theme which will be discussed later. Frame states:

Theologians, however, have long puzzled over what exactly the image of God consists of. Some have referred it to man's unique intellectual power, others to the soul as distinct from the body, others to man's relationship to God. Karl Barth found a parallel between "image" and "male and female" and so argued that the image consists in sexual differentiation, and therefore, more broadly, social relationships. Others have thought the image consists in man's dominion over the rest of creation (Gen. 1:26, 28) because that is a mirror of God's lordship. Still others, with NT justification, have identified the image with ethical qualities such as knowledge, righteousness, and holiness (Eph. 4:24; Col. 3:10). Some have sought a Christological interpretation of the image, since the NT presents Christ as the image in a preeminent sense (2 Cor. 4:4; Col. 1:15; Heb. 1:3) and the image in which we are to be renewed (Rom. 8:29; 1 Cor. 15:49; 2 Cor. 3:18).⁷

In addition to the broader question of the *Imago Dei*, Grudem attempts to answer the narrower question of how sin affects that which is made in God's image:

⁶ Pope John Paul II, *The Redemption of the Body and Sacramentality of Marriage* (Vatican: The Catholic Primer, 2006), 59-60 (April 2, 1980), accessed March 9, 2019, https://d2wldr9tsuuj1b.cloudfront.net/2232/documents/2016/9/theology_of_the_body.pdf.

⁷ John Frame, *Systematic Theology: An Introduction to Christian Belief* (Phillipsburg, NJ: P&R Publishing, 2013), 784-785.

We may define sin as follows: Sin is any failure to conform to the moral law of God in act, attitude, or nature. Sin is here defined in relation to God and his moral law. Sin includes not only individual acts such as stealing or lying or committing murder, but also attitudes that are contrary to the attitudes God requires of us. We see this already in the Ten Commandments, which not only prohibit sinful actions but also wrong attitudes.⁸

From a theologically conservative point of view, Grudem goes on to point out the seriousness and pervasiveness of sin:

Finally, we should note that this definition emphasizes the seriousness of sin. We realize from experience that sin is harmful to our lives, that it brings pain and destructive consequences to us and to others affected by it. But to define sin as failure to conform to the moral law of God, is to say that sin is more than simply painful and destructive — it is also wrong in the deepest sense of the word. In a universe created by God, sin ought not to be. Sin is directly opposite to all that is good in the character of God, and just as God necessarily and eternally delights in himself and in all that he is, so God necessarily and eternally hates sin. It is, in essence, the contradiction of the excellence of his moral character. It contradicts his holiness, and he must hate it.⁹

John Kilner summarizes his views on *Imago Dei*, which he sees most clearly in the incarnation of Jesus Christ. Through this focus, he comments on the ways man bears the image of God:

Ultimately, the image of God is Jesus Christ. People are first created and later renewed according to that image. Being in the image of God involves connection and reflection. Creation in God's image entails a special connection with God and also God's intention that people be a meaningful reflection of God, to God's glory. Renewal in God's image entails a more intimate connection with God through Christ and an increasingly actual reflection of God in Christ. Connection with God is the foundation of human dignity. Reflection of God is the aspiration of human destiny. All of humanity participates in human dignity. All of humanity is offered human destiny, though some embrace it while others choose a subhuman destiny instead.¹⁰

Middleton, examining the *Imago Dei* from an Old Testament context, points out the utility of including the body in the anthropological discussion:

⁸ Wayne Grudem, *Systematic Theology* (Grand Rapids, MI: Zondervan, 1994), 490.

⁹ *Ibid.*, 492.

¹⁰ John Kilner, *Dignity and Destiny: Humanity in the Image of God*, (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co., 2015), 311-312.

First of all, the interpretation of the *Imago Dei* among systematic theologians almost universally excludes the body from the image (whether explicitly or by omission), thus entrenching a dualistic reading of the human condition. Although few contemporary interpreters come to the Genesis text with the ascetic predilections of Origen or Augustine, nevertheless the unwarranted limitation of the image (to either a set of properties of the soul or to the human-divine relation) continues to perpetuate an implicit devaluation of the concrete life of the body in relation to spirituality.¹¹

Precedents for Theology Speaking into Science

What do theology and theological method have that can speak directly into science and make an impact in our research and explanation of the results? David Clark suggests five areas of impact. First, Christian theology explains why the universe is orderly, why it is arranged to be easily understood by mathematical interpretation, why it exists, and why its existence makes a difference in a Divine plan for all of creation. Second, Christian theology provides a metaphysical foundation for the rational justification of science. Theology explains why natural science is a rational endeavor. Third, Christian theology explains why science makes a difference in the understanding of life. Christian thinking helps people gain knowledge through science and greater understanding about God and the beauty of creation. Science is a value-laden activity. Fourth, a growing subgroup of scientists argues that theology can speak to science in a way that can direct future research. This goes past offering metaphysical, rational, and axiological grounds for science and assumes pragmatic advantages. Fifth, theological knowledge might aid in assessing competing scientific hypotheses. Consider a situation where scientists evaluate two incompatible models, both of which appeal to and account for substantial portions of the same empirical data. Theology can help in this area.¹²

Vern Poythress, a mathematically-trained theologian (with a Ph.D. in theology and a

¹¹ John Middleton, *The Liberating Image* (Grand Rapids, MI: Baker Publishing Group, 2005), 17.

¹² David Clark, *To Know and Love God: Method for Theology*, 227-228, 254-256.

Ph.D. in mathematics), considers the intersection of theological and mathematical truth and how these truths come together in creation. As a result of his background in two different disciplines, he sees evidence of God's divine characteristics being manifested in creation. He notes that three characteristics of natural law correspond to traditionally conceived attributes of God: first, that God is omnipresent (i.e. present in all locations), second, that God is immutable (i.e. He does not change), and third, that God is eternal (i.e. present at all times). It is not an accident that these three attributes of God are also mirrored in scientific law.¹³ This approach forms a useful paradigm where theology corresponds with science, particularly in the study of nature. If God created the world, it is obvious that there would be a reflection of His character in what He has made. The fact that there are detectable elements of His handiwork is remarkable. It is part of His plan to reveal these things and to allow man to rediscover them. This is one of the joys found in science. One can uncover design and beauty in new ways from perspectives that have not already been revealed.

Appropriate engagements and boundaries between the two domains have to be defined. For example, where might theology be harmful to or hinder the natural sciences, like trying to apply certain aspects of theological truth when there is no scientific utility to do so? Conversely, where might science be harmful to theology? Carl Henry notes that trying to do theology with only scientific tools will lead to incomplete results since not all the sources of knowledge and truth are used. Henry has some caution when considering Bernard Lonergan's theological methodology, which tries to leverage scientific methodology in theology. Henry surmises that

¹³ Vern Poythress, "Why is Science Possible," David Bundrick and Steve Badger, *Faith and Science Conference: Genesis and Genetics* (Springfield, MI: Gospel Publishing House, 2014), 16.

reducing theological method to the methods of the natural sciences unnecessarily limits our approach to the study of God:

Theology preserves its vitality only when it is sure of its own ground and engages in discourse with other disciplines. But on what basis will it pursue this dialogue? Rather than permitting theological subject matter to determine its own relevant method, Bernard J. F. Lonergan (*Method in Theology*) seeks in advance a method common to all sciences, theology included. He therefore risks the subsumption of some subject matter, especially that of theology, to other sciences. Lonergan affirms only the “virtually unconditioned” (hence highly probable, yet not beyond possibility of revision), and hence is indifferent to Scripture as a basic instrument of final truth. But a theological method derived from other sciences really adjusts theology to a general methodology that denies to theology its own distinctive object and subject matter. If the attempt to discuss God’s nature is confined to theological statements related to objects within the field of other objects, God will remain a mystery. Current religious knowledge-theory is historically conditioned by modern scientific controls and imposes upon theology an ideal borrowed from Leopold von Ranke’s scientific historiography. Theology is not to be chained in advance to the method of other sciences. Does not a scholar like Lonergan, who can write almost interminably on epistemology and not mention God, need to reconsider the relation between revelation and reason? Nobody should be overwhelmed by a discovery that we cannot reach the Christian doctrines by Lonergan’s method.¹⁴

Finally, Dale Matthews, a Christian medical doctor who argues for the efficacy of prayer and faith in a medical context, states:

I have witnessed recoveries, even healings, that cannot be fully explained by science. In particular, I have frequently observed the power that faith and religious commitment can exert in maintaining health and in helping people recover from and cope with illness. I am not alone: many other physicians have made similar observations.¹⁵

In summary, PART 1: Theology of Creation, the *Imago Dei*, and Its Anthropological Significance has introduced relevant theological work and key authors that will be leveraged for this area in my dissertation. There are key aspects of the *Imago Dei* whose reflection can be examined in molecular biological evidence. If man is created in the image of God, individuals

¹⁴ Carl Henry, *God, Revelation and Authority, Vol. 1*, 195-196.

¹⁵ Dale A. Matthews, *The Faith Factor: Proof of the Healing Power of Prayer* (New York: Penguin Publishing Group, 1998), 2.

will have some similar characteristics. Plus, our biology will help sustain people to fulfill their *Imago Dei* calling. Considering how this takes place can be done effectively using Pannenberg's anthropological historical science approach, which will be developed more in CHAPTER 4: ANALYSIS AND SYNTHESIS. There are examples of theologians and scientists that argue that there is a potential benefit for theology to provide insight that can directly be applied into science. Plus, faith and prayer can impact health and well-being.

PART 2: Spiritual Social Network

Prayer and Networking with God

Calling upon the name of the Lord impacts every aspect of life. Man's relationship with the Lord is one He wants man to foster.

Prayer and Healing

God answers prayers. There have even been studies that show prayer makes a difference in recovery and treatment. Matthews is a medical doctor who has published about such benefits. He argues that the benefits of having a positive view of the impacts of prayer and participating in religious activities are supported by available scientific research data should be part of medical therapy. With the aid of scientific rationale, physicians could recommend religious involvement for the following areas: (1) Stay healthy and avoid various diseases and like cancer and heart disease. (2) Recover faster with less complications for situations where serious illness happens. (3) Live a longer life. (4) Have greater peacefulness and less pain when confronting life-threatening and terminal illness. (5) Avoid mental illness, such as depression and anxiety, and deal more effectively with stress. (6) Be able to avoid problems with alcohol, drugs, and tobacco. (7) Experience a happier marriage and family life. (8) Discover a more fulfilling sense of

meaning and purpose in life.¹⁶ These kinds of benefits point to discoverable biological evidence for the benefits of the lifestyle and spiritual activities God wants man to experience. This includes the benefit of a supportive community.

Candy Brown has an encouraging title for her book, *Testing Prayer*, but she never seems reach solid conclusions from the data available on prayer and healing. She states, “This book has not answered all the questions it raised, and this has not been the intention. My hope is that other researchers will build in various ways on the foundations laid here and accept an invitation to bring science and religion into dialogue to examine empirical effects of prayer for healing.”¹⁷ Her findings from her book are unfortunate, but other others like Craig Keener have extensively documented miracle healing accounts from all over the world:

Many healing claims involve blindness, inability to walk, and even raisings from death; other claims involve sudden changes in nature after prayers. Despite some debatable instances, some other cases are fairly clearly extraordinary. It seems to me that to dispute that such phenomena have sometimes occurred is not really possible for open-minded people. What is more often disputed is what to make of such phenomena. How can investigators explain such phenomena?¹⁸

Others have a less enthusiastic point of view but are open within their worldview paradigm and methodological approach. Galanter, who nonetheless does excellent scientific research on alcoholism and the positive effect of support communities like Alcoholics Anonymous (AA), makes little distinction between Christian faith, general spirituality, cultic groups, or other forms of religion. When focusing on Christian groups, he tries to faithfully represent the practices and approach to life and spiritual formation of the Christian tradition, but

¹⁶ Ibid., 3-4.

¹⁷ Candy Gunther Brown, *Testing Prayer* (Cambridge: Harvard University Press, 2012), 292.

¹⁸ Craig S. Keener, *Miracles: The Credibility of the New Testament Accounts, Vol. 1* (Grand Rapids, MI: Baker Academic, 2011), 599.

he is consistent in his epistemological dualistic understanding, maintaining a scientific method approach where he, in effect, assumes his vantage point is superior to those who fully commit to faith in Christ. Relief in alcoholic craving symptoms is possible. There is biological and medical value in having a spiritual awakening in Christian faith (or other spiritual experience, Galanter would argue). A conservative view of Scripture would be viewed as intolerant and questionable since it does not bend to the latest cultural demands fighting against conservative theological tenets.¹⁹

Prayer's Impact on Addictive Behavior

Selvam points out how prayer provides a protective effect on addictive behavior:

“Generally, religiosity has been found to have some protective effect on addictive behavior, and spirituality is said to sustain maintenance of recovery.”²⁰ Selvan also notes that contemplative prayer has significant impact on alcohol use: “The contemplative practice had some significant impact on the participants’ use of alcohol, at least based on how they reported it.”²¹

Lambert states that high spirituality and religiousness associates with lower alcohol use:

“Four methodologically diverse studies (N=1,758) show that prayer frequency and alcohol consumption are negatively related.”²² He goes on to state the following:

High spirituality and religiousness most often appear to be associated with lower alcohol consumption and alcohol-related problems, but why might this be the case? One possibility may be that prayer can be an alternative form of coping. Religion or spirituality may, in some instances, satisfy some of these motivations, thus reducing the motivation to drink. Religiosity or spirituality may be an alternative source people can

¹⁹ Marc Galanter, *Spirituality and the Healthy Mind*, 113-127.

²⁰ Sahaya Selvam, “Character Strengths in the Context of Christian Contemplative Practice Facilitating Recovery from Alcohol Misuse: Two Case Studies,” *Journal of Spirituality in Mental Health* 17 (2015): 190–211.

²¹ *Ibid.*

²² Nathaniel Lambert, et al., “Invocations and Intoxication: Does Prayer Decrease Alcohol Consumption?” *Psychology of Addictive Behavior* 24, no. 2 (2010): 209-219.

turn to cope with life's challenges, thus mitigating the motivation to use alcohol to cope.²³

Harrell points out that religious coping is associated with less alcohol use:

The present study examined social support and alcohol norms as mediators of the relationship between religious coping and college drinking (e.g., frequency and heavy drinking). The sample consisted of college students (n = 129) and their parents (n = 113). Religious coping (parent and student) was associated with less frequent alcohol use and less heavy drinking. Using a path model to test direct and indirect effects, the mediators were entered simultaneously and allowed to correlate with each other. Alcohol norms mediated the relationship between religious coping and drinking outcomes. Social support was not a significant mediator.²⁴

In reference to one of his studies, Byrd points out that prayer and intercessory prayer have a beneficial impact on medical conditions and recovery:

In this study I have attempted to determine whether intercessory prayer to the Judeo-Christian God has any effect on the medical condition and recovery of hospitalized patients. I further have attempted to measure any effects, if present, of those prayers. Based on these data there seemed to be an effect, and that effect was presumed to be beneficial.²⁵

Epperly notes that spirituality and medicine are working together. He states, "The wall of separation between spirituality and medicine is crumbling. Physicians are discovering the importance of prayer, spirituality, and religious participation in enhancing physical and mental health and responding to stressful life circumstances."²⁶

Brewer-Smyth and Koenig suggest that faith-based communities promote forgiveness rather than retaliation: "Despite many methodological problems, it appears that religiosity—

²³ Ibid.

²⁴ Zaje Harrell and Kandace Powell, "The Relationship Between Parent and Student Religious Coping and College Alcohol Use," *Journal of Religion and Health* 53, (2014): 895-903.

²⁵ Randolph Byrd, "Positive Therapeutic Effects of Intercessory Prayer in a Coronary Care Unit Population," *Southern Medical Journal* 81, no. 7 (July 1988).

²⁶ Bruce Epperly, "Prayer, Process, and the Future of Medicine," *Journal of Religion and Health* 39, no. 1, (Spring 2000).

encompassing all aspects of religious life—might be a protective factor against several mental health problems.”²⁷ They go on to argue that trauma is a precursor for many mental health conditions:

Trauma is a precursor to many mental health conditions that greatly impact victims, their loved ones, and society. Studies indicate that neurobiological associations with adverse childhood experiences are mediated by interpersonal relationships and play a role in adult behavior, often leading to cycles of intergenerational trauma. There is a critical need to identify cost effective community resources that optimize stress resilience. Faith-based communities may promote forgiveness rather than retaliation, opportunities for cathartic emotional release, and social support, all of which have been related to neurobiology, behavior, and health outcomes.²⁸

Kraus in his study shows that more frequent church attendance and frequent spiritual support are associated with a more benevolent view of God:

This study has two goals. The first is to assess whether a benevolent image of God is associated with better physical health. The second goal is to examine the aspects of congregational life that is associated with a benevolent image of God. Data from a new nationwide survey (N = 1774) are used to test the following core hypotheses: (1) people who attend worship services more often and individuals who receive more spiritual support from fellow church members (i.e., informal assistance that is intended to increase the religious beliefs and behaviors of the recipient) will have more benevolent images of God, (2) individuals who believe that God is benevolent will feel more grateful to God, (3) study participants who are more grateful to God will be more hopeful about the future, and (4) greater hope will be associated with better health . . . The findings involving the relationships among the latent constructs are provided . . . Taken as a whole, these data provide support for the core study hypotheses that were discussed earlier. More specifically, the findings indicate that more frequent church attendance ($\beta = 0.077$; $p < 0.01$) as well as more frequent spiritual support ($\beta = 0.362$; $p < 0.001$) are associated with having a more benevolent view of God.²⁹

²⁷ Kathleen Brewer-Smyth and Harold G. Koenig, “Could Spirituality and Religion Promote Stress Resilience in Survivors of Childhood Trauma?” *Issues in Mental Health Nursing* 35 (2014): 251-256.

²⁸ Ibid.

²⁹ Neal Kraus, Robert Emmons, and Gail Ironson, “Benevolent Images of God, Gratitude, and Physical Health Status,” *Journal of Religion and Health* 54 (2015): 1503-1519.

Impact of a Support Network

Hagen finds that a significant positive relationship exists between religiosity and mental health. He states, “Extensive literature suggests that religiosity is a protective factor in reducing a number of deviant behaviors, including sexual aggression (SA).”³⁰ He goes on to point out the following: “A significant positive relationship between religiosity and mental health was found (0.10, $p < 0.0001$) when combining all effect sizes and ignoring definitional or categorical variations in type of religiosity and type of mental health.”³¹

Spiritual Support Groups Including Twelve Step Groups

Jankowski suggests that religiousness can provide a protecting influence against substance abuse and adolescent hazardous alcohol use. He states, “Religiousness can exert a protective influence on adolescents’ hazardous alcohol use. Hazardous alcohol use refers to consumption patterns that are associated with increased risk of harmful consequences to self and others.”³²

Backing his assertions with clinical studies, Matthews states that being part of religious groups delivers greater health benefits than secular ones. Thus, it is more than just social networking; it is intentional, spiritually-based social networking where one draws support. Individuals in religious support networks have more and deeper engagements than those

³⁰ Timothy Hagen et al., “Religiosity Reduces Sexual Aggression and Coercion in a Longitudinal Cohort of College Men: Mediating Roles of Peer Norms, Promiscuity, and Pornography,” *Journal for the Scientific Study of Religion* 57, no. 1 (2018): 95-108.

³¹ Ibid.

³² Peter Jankowski, et al., “Religiousness and hazardous alcohol use: A conditional indirect effects model,” *Journal of Adolescence* 36 (2013): 747-758.

involved with secular ones. The support of general church community and spiritually aligned families are also components that have positive therapeutic values.³³

Researchers are concluding that there is a high value in mutually supportive communities, especially when they are included as part of a treatment plan:

Members of the lay public may conclude that certain healthcare issues are inadequately addressed by the medical community, particularly when doctors are not sufficiently attentive to the emotional burden that an illness produces. When mutually supportive groups of laymen coalesce to implement a response to this perceived deficit, they may form a spiritual recovery movement, one premised on achieving remission based on beliefs independent of evidence-based medicine.³⁴

Galanter has done research that shows that Alcoholic Anonymous members experience a spiritual awakening similar to what took place in the Great Awakening. He states, “Out of the 180 respondents, 161 (89%) reported having had at least one spiritual awakening.”³⁵ Galanter’s research demonstrates that there is a neuroscientific and biological grounding for substance abuse, addiction, recovery, and spiritual awakening, “A biologically grounded model for spiritual awakening can be considered as well. Based on recent empirical research, the relationship between cognition and personal change relative to the addictive process can be described from the perspective of neuroscience.”³⁶ He also states about the relationship between spiritual awakening and conversion, “The experience of spiritual awakening can be likened to religious conversion, because both involve a major transformation in personal disposition toward a

³³ Dale Matthews, *The Faith Factor: Proof of the Healing Power of Prayer*, 239-250.

³⁴ Marc Galanter, “The Concept of Spirituality in Relation to Addiction Recovery and General Psychiatry (Chapter 8).” Marc Galanter and Lee Ann Kaskutas, ed., *Recent Developments in Alcoholism* (Totowa, NJ: Springer, Humana Press, 2008), 134.

³⁵ Marc Galanter et al., “Spiritual Awakening in Alcoholics Anonymous: Empirical Findings,” *Alcoholism Treatment Quarterly* 32, nos. 2-3 (2014): 319-334.

³⁶ *Ibid.*

spiritually-oriented perspective on life; both carry implications for a change in behavior in line with a particular set of beliefs.”³⁷ Finally, he comments on benefits of religious conversion: “Studies on changes undergone by individuals who experience religious conversion have typically found that converts experience varying degrees of distress beforehand, and subsequently, relief of that distress and greater meaning in life.”³⁸ As a result, individuals can see how Galanter studies alcohol and substance abuse as an impartial scientist and that his findings accurately convey what can be concluded from the empirical results of the data.

Galanter notes that addiction is a chronic illness subject to relapse. In his studies, religious devotion buffered against life’s stressful events and helped protect against mental disorders. Moreover, he states that “[i]n recent years, this area of empirical research has been greatly enhanced by the availability of functional magnetic resonance imaging (fMRI), which allows for determining which brain regions are more active during specific psychological tasks.” He also was able to identify different kinds of empathy: “Two types of empathy have been differentiated in fMRI studies: emotional contagion and cognitive perspective taking, and they have been empirically determined to be associated with discretely different cortical sites.”³⁹ Brain studies are very important and are mentioned here to show there is valuable work being done exploring this area. Unfortunately, access to genetic and epigenetic samples of brain tissue from live patients in normal circumstances are difficult to get with the current available technology.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Marc Galanter, “Alcoholics Anonymous and Twelve-Step Recovery: A Model Based on Social and Cognitive Neuroscience,” *American Journal on Addictions* 23 (2014): 300-307.

Alcoholic Anonymous prayers are associated with self-reported reduction in alcohol craving. This suggests a neural process underlying the effectiveness of these prayers. Spiritual awakenings result in reduced alcohol use after treatment.⁴⁰ There are critical transition points in childhood where the risk for drug and alcohol use is elevated.⁴¹

Innovation Champions

Everett notes from his research the importance of an innovation champion in the adoption of a new idea, process, or belief. He argues that a champion is characterized as a charismatic individual who strongly stands behind an innovation. Thus, an innovation champion is key in overcoming the resistance to a new idea that an organization may have. Early on when a community is exposed to a new innovative idea, this will be significant. The innovation champion will help boost the idea in the organization or community. Opponents can try to resist with their own ideas (or technology), as two or more emerging positions begin to fend against each other. Everett points out how in past research an innovation champion has been key in the innovation process. There has to be a champion, or the idea will likely die.⁴² This idea is relevant in sharing the gospel message or developing and sustaining members in a supportive Christian community. This concept is leveraged by showing how early church leaders acted as innovation champions who imparted their God-inspired ideas into their communities, and the results exploded throughout the world. Individuals build upon their calling in the *Imago Dei* mission and add their own innovative contributions within the context of their communities and

⁴⁰ Marc Galanter, "An initial fMRI study on neural correlates of prayer in members of Alcoholics Anonymous," *American Journal of Drug and Alcohol Abuse* 43, no. 1 (2017): 44-54.

⁴¹ Rohan Palmer, John McGeary, "Models of drug addiction: Theories and future applications in prevention and treatment," *Brown University Child and Adolescent Behavior Letter*, May 2016.

⁴² Everett M. Rogers, *Diffusion of Innovations*, 5th ed. (New York: Free Press, 2003), 414.

networks.

PART 3: Molecular Biology, Genetics, and Epigenetics

Overview

This section introduces key molecular biology, genetic, and epigenetic precedents and insights from the literature. The associated science looks at human deoxyribonucleic acid (DNA), a fundamental compendium of organism functional information, in several ways that will be broadly introduced here. Most of the detailed research assessment will be in the analysis section. A few authors are mentioned here to summarize key areas of existing precedents, and the dissertation will examine these areas in more detail.

There is active research going on in molecular biology, genetics, and epigenetics. The number of organisms that have their genome sequenced is growing exponentially. Trying to associate the emerging findings with the existing naturalism scientific method paradigm has proven very challenging. One of the research threads that has emerged is trying to enhance the fidelity of the genetic and epigenetic characterization as time goes by.

Kendler notes that there is an important and beneficial relationship between religion and confronting mental illness and substance abuse. He states, “Given its importance in human society and behavior, religion is relatively neglected in empirical studies exploring the etiology of mental illness and substance abuse.”⁴³ He goes on to point out that his results verify and develop further the fact that “religiosity is significantly and inversely related to alcohol and drug use.”⁴⁴

⁴³ Kenneth Kendler, et al., “Religion, Psychopathology, and Substance Use and Abuse: A Multimeasure, Genetic-Epidemiologic Study,” *American Journal of Psychiatry* 154, no. 3 (March 1997).

⁴⁴ Ibid.

Use of Focused Molecular Biological Databases

Some online sources and databases attempt to bring various molecular biological research threads together topically. McKusik's Online Mendelian Inheritance in Man (OMIM) is useful to mention here. Their website states, "OMIM is a comprehensive, authoritative compendium of human genes and genetic phenotypes that is freely available and updated daily."⁴⁵ Leveraging reported research results on the molecular biological process of alcohol metabolism from OMIM can be found in the assessment and discussion in PART 3: Redemptive Evidence.⁴⁶ dbSNP is another resource that considers the functions of specific parts of the genome, observing how changes in one nucleotide (a single bit of DNA information) impacts function based on single nucleotide polymorphisms (SNPs). A specific SNP that is part of alcohol metabolism is identified in UNIT 2: Genetic and Epigenetic Data Assessment, and its function based on variants seen in biological samples for specific populations filtered based on survey data is examined.⁴⁷ The intent is to show a very specific example of the type of analysis that can be done when trying to address the biological component of the Research Question discussed in the introduction.

During the literature review and the initial research there was an attempt to find the most relevant and accessible data set that would allow the type of assessment being examined in this

⁴⁵ Victor McKusik, "Online Mendelian Inheritance in Man," www.omim.org/about, accessed February 20, 2019.

⁴⁶ Victor A. McKusick, "Online Mendelian Inheritance in Man," Ensembl RS129984 <https://www.omim.org/entry/103720?search=adh1b%20alcohol&highlight=adh1b%20alcohol>, accessed February 20, 2019.

⁴⁷ dbSNP Short Genetic Variation Reference SNP (refSNP) Cluster Report: RS1229984, www.ncbi.nlm.nih.gov/projects/SNP/snp_ref.cgi?rs=1229984, accessed February 20, 2019.

dissertation. The UK Biobank⁴⁸ and the processed data from Neale Labs⁴⁹ that is based on the UK Biobank resources. They were chosen since there is enough publicly available information to do the assessment.

Shortcoming of Existing Scientific Explanations

John Sanford has had a long career that involves seeing scientific evidence as supporting more than naturalistic results. The current naturalistic arguments do not adequately explain the evidence seen in the world. Even as science advances, there are signs upon which one cannot converge on a complete understanding with empirical tools and data only. From a biological standpoint, John Sanford argues, “Isn’t it remarkable that the Primary Axiom of biological evolution essentially claims that typographical errors and limited selective copying within an instruction manual can transform a wagon into a spaceship in the absence of any intelligence, purpose, or design? Do you find this concept credible?”⁵⁰ He suggests that it is unlikely that one will ever completely understand the complexity of the genome, and that one most likely cannot completely understand it. This suggests a Divine component:

The bottom line is this: the genome’s set of instructions is not a simple, static, linear array of letters— but is dynamic, self-regulating, and multi-dimensional. There is no human information system that can even begin to compare to it. The genome’s highest levels of complexity and interaction are probably beyond the reach of our understanding, yet we can at least acknowledge that these higher levels of information exist. While the linear information within the human genome is extremely impressive, the non-linear information must obviously be much greater. Given the unsurpassed complexity of life, this has to be true.⁵¹

⁴⁸ UK Biobank, www.ukbiobank.ac.uk, accessed December 14, 2018.

⁴⁹ Neale Labs UK Biobank GWAS Results. www.nealelab.is/uk-biobank, accessed December 3, 2018.

⁵⁰ John Sanford, *Genetic Entropy* (Ithaca, NY: FMS Publications, 2015), 2-4.

⁵¹ *Ibid.*, 9-11.

Molecular Biology, Genetic, and Epigenetic Research Related to Alcohol Metabolism

The focus area in the molecular biological assessment is alcohol related processing gene regions. Here are a few examples of precedents that motivate this exploration. Palmer notes that biometric studies have shown there are genetic factors for substance abuse. These factors increase with age. Plus, there are similar factors for drug addiction, personality traits, and conduct problems.⁵² Nieratschker points out that epigenetic mechanisms lead to functionally relevant modifications of the genome as they induce stable changes in gene expression, which consequently influence the phenotypic (observables components of an organism) outcome.⁵³

Edenberg provides the following description of alcohol metabolism, pointing to two key enzymes, ADH and ALDH; the ADH enzyme will be examined in detail in the assessment section:

The effects of ingested beverage alcohol (i.e., ethanol) on different organs, including the brain, depend on the ethanol concentration achieved and the duration of exposure. Both of these variables, in turn, are affected by the absorption of ethanol into the blood stream and tissues as well as by ethanol metabolism. The main site of ethanol metabolism is the liver, although some metabolism also occurs in other tissues and can cause local damage there. The main pathway of ethanol metabolism involves its conversion (i.e., oxidation) to acetaldehyde, a reaction that is mediated (i.e., catalyzed) by enzymes known as alcohol dehydrogenases (ADHs). In a second reaction catalyzed by aldehyde dehydrogenase (ALDH) enzymes, acetaldehyde is oxidized to acetate. Other enzymes, such as cytochrome P450 (e.g., CYP2E1), metabolize a small fraction of the ingested ethanol.⁵⁴

Ponomarev makes several interesting comments about epigenetic control of gene expression in a brain that has adapted to chronic alcohol use:

⁵² Rohan Palmer, John McGeary, “Models of drug addiction: Theories and future applications in prevention and treatment,” *Brown University Child and Adolescent Behavior Letter*, May 2016.

⁵³ Vanessa Nieratschker, et al., “Genetics and epigenetics of alcohol dependence,” *Journal of Molecular Psychiatry* 1, no. 11 (2013).

⁵⁴ Howard Edenberg, “The Genetics of Alcohol Metabolism, Role of Alcohol Dehydrogenase and Aldehyde Dehydrogenase Variants,” *Alcohol Research and Health* 30, no. 1 (2007).

Chronic alcohol exposure causes widespread changes in brain gene expression in humans and animal models. Many of these contribute to cellular adaptations that ultimately lead to behavioral tolerance and alcohol dependence. There is an emerging appreciation for the role of epigenetic processes in alcohol-induced changes in brain gene expression and behavior. For example, chronic alcohol exposure produces changes in DNA and histone methylation, histone acetylation, and microrna expression that affect expression of multiple genes in various types of brain cells (i.e., neurons and glia) and contribute to brain pathology and brain plasticity associated with alcohol abuse and dependence. Drugs targeting the epigenetic “master regulators” are emerging as potential therapeutics for neurodegenerative disorders and drug addiction.⁵⁵

Ponomarev argues that the “brain arguably is one of the most complex biological tissues and enables the organism to sense, remember, and respond to its environment. It constantly adapts to environmental stimuli through regulated changes in gene expression.”⁵⁶ He goes on to note, “Studies assessing epigenetic regulation of individual genes in the brain have shown that alcohol’s effects on DNA methylation depend on a variety of factors, including the specific gene targets, developmental stage of exposure, and type of neuronal tissue affected.”⁵⁷ There is a central epigenetic control processing role in an alcoholic brain that has undergone changes in brain gene expression and behavior. In reference to gene expression, this forms a key part of the development of alcohol addiction.⁵⁸ Therefore, alcohol addiction not only impacts functions in organs such as the liver, but in higher level functions in the brain. There is a system response to alcohol.

Alcohol Environmental Effects and Fetal Alcohol Spectrum Disorder (FASD)

There is detailed research on the impact of alcohol exposure in the womb. A good

⁵⁵ Igor Ponomarev, “Epigenetic Control of Gene Expression in the Alcoholic Brain,” *Alcohol Research: Current Reviews* 35, no. 1, (2013).

⁵⁶ *Ibid.*

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

summary of these results has been published in “Genetics and Epigenetics of Fetal Alcohol Spectrum Disorders,” edited by Feng Zhou and Stephen Mason.⁵⁹ Fetal Alcohol Spectrum Disorder (FASD) is linked to major changes in the hypothalamic-pituitary adrenal (HPA) axis, resulting in lifelong impairments with mental disorders, retardation, and sensitivity to stress. FASD comes from a complex combination of genetic and epigenetic factors. FASD may be traced back at least in part to aberrant epigenetic marks that occurred during gamete (mature male or female germ cell) production. At three critical early development phases of a baby, alcohol can cause epigenetic change in the brain for life, damaging gene expression, (1) when gametes are being produced or matured, (2) after fertilization but before implantation during rapid development changes, and (3) when three germ layers are being defined.⁶⁰ Epigenetic changes due to ethanol are permanent and can broadly impact the genome. A specific example is how male germ lines transmit the impact of the alcohol exposure during womb development across generations.⁶¹ Such findings indicate that the effects of alcohol exposure may be carried beyond expectation in subsequent generations. Alcohol induced FASD and accompanied mental and cognitive deficits are also likely to impose their action through epigenetics not only at the prenatal level, but also continuously in postnatal life.⁶²

⁵⁹ Zhou, Feng. Mason, Stephen. “Genetic and Epigenetics of Fetal Alcohol Spectrum,” *Frontiers in Genetics*, June 2015.

⁶⁰ Feng Zhou and Stephen Mason, “Genetic and Epigenetics of Fetal Alcohol Spectrum,” *Frontiers in Genetics*, June 2015. Edward Mead and Dipak Sarkar, “Fetal alcohol spectrum disorders and their transmission through genetic and epigenetic mechanisms.”

⁶¹ D. Govorko, R.A Bekdash, C., Zhang, and D.K Sarkar, “Male germ line transmits fetal alcohol adverse effect on hypothalamic proopiomelanocortin gene across generations,” *Biol. Psychiatry* 72, 378–388. doi: 10.1016/j.biopsych.2012.04.006, 2012.

⁶² Trygve Tollefsbol, *Handbook of Epigenetics: The New Molecular and Medical Genetics* (Birmingham. AL: Elsevier Science, 2017), 488.

CHAPTER 3: METHODOLOGY

Overview

Four criteria will be used in this dissertation to evaluate the evidence: (1) historical science and human biology, (2) explicate verses implicate order, (3) explanatory filters and the inference to the best explanation, and (4) abduction and aesthetic order. This dissertation challenges the claim is that methodological naturalism in the scientific method is an adequate model of investigation. Rather, a non-naturalistic method that embraces Divine non-physical agentive intervention can: (1) mitigate philosophical blind spots in science, (2) expand the possible “solution space domain” and provide an approach to help select the best viable explanatory alternative, and (3) provide more tool diversity, allowing for greater checks and balances in formulating experiment designs, analyzing data, and interpreting the results.

This research project will examine God’s character in relationship to creation and mankind. The intent is to summarize what divine qualities or attributes might be detectable in God’s design the way one might analyze a programmer’s code and learn about the coder’s methods in his use of design patterns. It will also examine God’s intentions with man, i.e. how He made people for relationship and how He allows individuals to have God encounters that can have significant lasting impacts. This will be done by exegeting Scripture and examining the early church. With this information, this dissertation will utilize research methods that embrace non-naturalistic means. It considers whether a theologically-informed researcher may assess scientific data with additional knowledge and insight, and existing scientific data is analyzed to explore the potential impact of this method.

Here are a few additional methodological comments for each of the three sub-areas:

Theologically, key biblical passages that characterize God's divine plan, His purposes in creation, and the impact of blessings and curses, sin, and the focus on redemption will be examined. Examples from the Old Testament, New Testament, and examples of the early church fathers will help to quantify some characteristics of individuals who had God encounters.

For spiritual social networking, the goal is to characterize the *Imago Dei* calling and spiritual formation similarities in both Old Testament, New Testament, and early church fathers and see how these findings could be applied to the population in the analyzed biological samples from the UK Biobank data.

Examples in the scientific literature show the limitations of natural science to explain scientific results when new results and challenges come up that do not align with the accepted paradigm. These challenges include complexity, wide ranges in time and distance scales, situations where mathematical infinity comes up, and potentially problematic energy requirements. In addition, approaches to theology and science integration will be considered from a philosophical point of view.

Research sampling applies in three ways. First, for the theological research, the sampling will examine Divine revelation from biblical texts, key theologians' views, and the historical testimony of the early church. Second, for spiritual social networking and ecologies research, representative samples from the Old Testament, New Testament, and early church will be evaluated, comparing twenty-three individuals. Third and finally, for science and creation, genetic data from the UK Biobank with large population sample sizes (between 1,000 and 500,000) will be used. Below is a summary of key efforts for each of the three areas of this dissertation in terms of research and technique.

- **Theology:** Perform biblical exegesis to develop a theology of God’s purpose and intention as expressed in God’s plan for creation, what Divine revelation says about creation, and the resources God has given man to deal with sin and experience redemption and recovery.
- **Spiritual Social Network:** Examine individuals in the midst of spiritual social networks, innovation champions, community and church ecologies, and idea contagion. Consider key figures in the Bible and the early church who had God encounters. Look at them from a spiritual social networking and spiritual formation context.
- **Science and Creation:** Analyze select sources of genetic and genome wide association study (GWAS) data, epigenetic and epigenome wide association study (EWAS) data, substance abuse data, and prayer, faith, and religiosity assessment data. Look specifically at alcohol metabolism, targeting the enzyme gene rich region in human Chromosome 4 (ADH), a key alcohol gene (ADH1B), and its allele variants (ADH1B*1, ADH1B*2, ADH1B*3).

Evaluation Framework and Criteria

Introduction

This dissertation leverages a previously published work by the author that introduces a methodological approach describing how theology can speak directly into science.⁶³ The claim is that this approach may suggest new insights outside of epistemological dualism, which separates knowledge of natural and supernatural truth. For example, are there things that cannot be explained adequately by science? Moreover, how can one know the capability of one’s measuring tools without an external calibration source and an absolute frame of reference to provide a basis for what one is considering? This section attempts to illustrate how including theological method and knowledge may be useful in science. In addition, the four evaluation criteria that will be used to assess the claim that there may be anthropological, historical science, and human biology evidence for the *Imago Dei* will be introduced.

⁶³ James Johansen, “Applied Theology: Exploring the Utility of Theological Method in Scientific Research with Genomic Research as an Example,” Jonathan Bartlett, *Naturalism and Its Alternatives in Scientific Methodologies: Proceedings of the 2016 Conference on Alternatives to Methodological Naturalism* (Broken Arrow, OK: Blyth Institute Press), 2016.

Motivation for the Methodological Approach

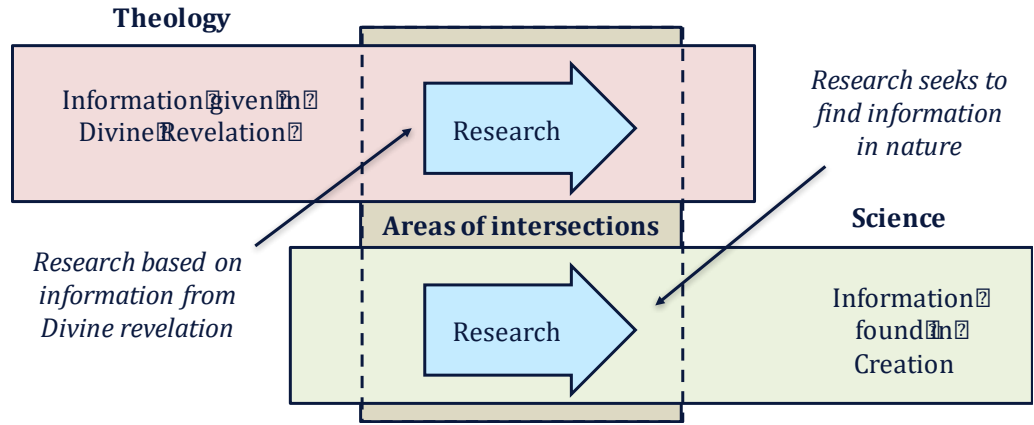
It is difficult to understand the challenging trends in the various areas of scientific development and continue to discover greater understanding and insight at the forefront within a number of these fields. The claim being explored in this research suggests that adding theology into aspects of scientific research can help. For example, the hypothesis that life comes from unguided processes has been explored for over 150 years, but comprehensive data validating this hypothesis has not materialized as hoped. If researchers remain open to other epistemological models, especially ones that allow a broader metaphysical range, then one might uncover implicate insight unavailable to models that are strictly empiricist. There are examples of scientists who have done this, even if not in a structured way. This does not nullify the current scientific method; instead, this approach should be considered as an option that can be used in research and discovery.

Theology can help inform naturalistic science in following ways: it can inform a researcher about science's philosophical limitations and shed light on what some would call science's blind spot; it can enhance the possible solution space domain and provide an approach to evaluate explanatory alternatives; and it can provide greater insight in formulating experimental designs, analyzing data, and interpreting the results.

How can theology be directly applied to the natural sciences? Theology and science do not easily mix in many ways since their primary foci serve very different things. The study of God and how the study of God can draw man closer to God are categorically different from the study of the physical world. Still, there are intersections between the two disciplines, and, at boundary conditions, one may need to switch to a larger metaphysical scope—a scope allowed by a theologically-enhanced domain that includes both physical and nonphysical phenomena for better explanatory perspectives.

Theology begins with Divine revelation (i.e., information for our purposes here, plus a great deal more) and then does research, while science does research and experimentation in order to uncover information about the physical world. There is an intersection where these two could work together in the research domain and is illustrated in Figure 1.

Figure 1. Intersection of Theological and Scientific Knowledge and Research



Benefiting from research in both domains, this dissertation shows that greater insight can be made into man’s understanding of reality and the nature of the scientific world. Part of this methodology will utilize insight from philosophy of science and philosophical theology. Philosophy can act as a mirror while theology can act as a measuring stick. The theologically-informed researcher can gain greater insight into the nature of God’s kingdom and mission through the examination of how the natural world functions.

By utilizing both domains, one can consider the realm of Divine truth with both physical and non-physical reality. Theology provides a basis for truth claims and knowledge claims, and it can even provide a “sanity check.” If one allows theology to be brought into the discussion, one can consider implicate areas that go beyond what one can fully examine empirically in order to gain full comprehension. There are some guidelines provided from theology that can be delineated by utilizing theological method, and these principles can be applied as augmentation

to scientific analysis. If the physical world around us is not completely knowable, then allowing divine revelation to provide a basis for understanding is useful. It is also claimed that with theology one can more precisely define the characteristics of a designed world, and perhaps discern teleology in nature.

If God does exist and all is not revealed or knowable by man, theology can highlight the knowledge gap between what one knows empirically, and what one knows as theological and metaphysical truth. Thus, theological principles can help provide a basis for determining truth and what is knowable. By effectively having a yard stick to measure the world, it may highlight science's shortcomings and suggest where scientific research may be profitably done.

Several theologians and their applicable ideas will be considered in this chapter. For example, Clark argues theology can help science improve its process and results, and Poythress uses both theological and mathematical approaches in his consideration of the evidence of divine characteristics in the created world. This is a useful concept that is utilized in this work and proposed to be included in follow-up efforts.

Because theological and scientific methods can work together, it is useful to briefly introduce both for the context of this paper. First, theological method is similar in philosophical concept to the scientific method. Theological method defines the approach one takes to study theology and make decisions on how to address the nature of God, the ultimate source of truth, Divine authority, and an assessment of biblical content. Defining a structured theological process can enable an individual to explain to others how his or her theological analysis can be a rigorous process that can identify objective truth. The realm of truth can extend beyond empirical data from measured results. A general theological method is not as common as the ubiquitously used scientific method. Divine revelation is given in the Bible, and there is an examination of this

information given in the Appendix section Theological Insights on Creation and God's Plan.

Second, the scientific method is conceptually understandable to most people. Scientific research looks at empirical data without *a priori* knowledge of how it is meant to work. This is challenging and limits what one can measure under the circumstances in which the measurements are taken. Genomic research is a good example of an active area of research where new associations are being made between functions and specific aspects of organisms' genomes. Scientific examples in this chapter include (1) bioinformatics and genome sequence assessment, (2) DNA multi-functionality and polymorphisms, and (3) what could be classified as an area of system biology, looking at cellular function as a holistic system.

My claim is that augmenting scientific research with theological method and knowledge can improve scientific reasoning. Looking at a specific scientific area, theological reflection can improve science in the examination of genomic information in that it can: (1) generate better approaches for experiment design, (2) allow for more robust data interpretation, and (3) improve the calibration of what can be known. Calibration here deals with how to interpret what specific signatures mean. Calibration would then quantify the meaning of the signatures and the amount of information that is seen.

In support of this claim, one can consider examples of what some call the limitation of the existing methodological paradigm. The current naturalistic arguments do not adequately explain the evidence seen in the world around us. For example, after 150 years, there is no comprehensive molecular biology scientific data assertion that supports common tree of life biological development by unguided processes. Concepts like Neo-Darwinism and emergence are being postulated as theories, but these concepts suggest movement away from the current scientific paradigm rather than evidence in support of an already defined theory. Even as science

rapidly advances, there are signs that one cannot, in principle, converge on a complete understanding of nature with empirical tools and data only.⁶⁴

In this section, I introduce an approach to evaluate if, when, and how theological method can be included in scientific exploration and data analysis. From a cross-domain perspective, how can existing theories be evaluated? How can the gap between what is known and what is not known be quantified?

In this dissertation, I propose the use of filtering (and effectively creating decision gates). Filtering is a method of selecting certain explanatory and hypothetical options and eliminating others that do not apply for desired outcome. These clarifying filters are used in a step-by-step fashion to consider how theological and scientific methodologies could be synthesized to provide more meaningful results. Filtering may give insight and help quantify major components that are being analyzed in a controlled experiment. One of the goals is to see how one can quantify and utilize theological method in a structured way.

The following four evaluation criteria are used to assess the claim that there may be anthropological, historical science, and human biology evidence for the *Imago Dei*. First, Pannenberg suggests that historical science and human biology are two important areas to derive an anthropological understanding of the nature of man. Second, David Bohm, looking at the world of physics, observes that there is a need to look at a deeper level of reality, the implicate order level, instead of just the explicate order level by only considering known empirical data. Third, explanatory filters and inference to the best explanation are considered when assessing when and how theological method and knowledge can be applied. Fourth, abductive arguments

⁶⁴ Thomas Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (Oxford: Oxford University Press, 2012), 4.

and aesthetic awareness are considered to frame how and why one makes arguments and how they tend to move towards aesthetically pleasing themes and the designer who made them.

Evaluation Criteria 1: Historical Science and Human Biology

This first criteria considers the implications of the *Imago Dei*, the impact of sin, and their resulting anthropological significance. Pannenberg suggests an anthropological methodological approach that combines both historical science and human biology.⁶⁵ This dissertation does both of historical science and human biology examinations by exploring the history of twenty-three specific biblical and early church innovation champions and then looking at a specific aspect of molecular biology. Following Pannenberg's approach, two sections examine these two fundamental areas. In historical science, while doing a historiographical study of the Bible and church father texts, the comparison of twenty-three individuals are used to highlight anthropologically significant factors that exemplify these leaders who were seen operating in their *Imago Dei* calling (moral agents made in the image of God). In terms of human biology, human alcohol metabolism and the impact of religiosity factors show that individuals as human beings have the unique ability to experience redemption and recovery within their very biology, and this is likely due to their being designed to reflect God.

Evaluation Criteria 2: Implicate and Explicate Order

This second criteria considers a factor that considers two types of order: explicate, what is directly knowable from empirical data, and implicate, which requires one to consider higher levels of reality beyond what can be directly observable or logically follow just from known scientific data. David Bohm in his book *Wholeness and the Implicate Order* notes that there is a

⁶⁵ Wolfhart Pannenberg, *Anthropology in Theological Perspective*, 10-23.

need to have a more comprehensive understanding of what is observable than just explicit empirical data. To truly understand the big picture, one should be aware of the explicate and implicate order. Bohm considers this insight as he examines quantum theory. He offers the motivation for examining evidence from an implicate order point of view:

All this calls attention to the relevance of a new distinction between implicate and explicate order. Generally speaking, the laws of physics have thus far referred mainly to the explicate order. Indeed, it may be said that the principle function of Cartesian coordinates is just to give a clear and precise description of explicate order. Now, we are proposing that in the formulation of the laws of physics, primary relevance is to be given to the implicate order, while the explicate order is to have a secondary kind of significance (e.g., as happened with Aristotle's notion of movement, after the development of classical physics). Thus, it may be expected that a description in terms of Cartesian coordinates can no longer be given a primary emphasis, and that a new kind of description will indeed have to be developed for discussing the laws of physics.⁶⁶

Quantum theory provides evidence that does not align with our experience of our macro-level interaction with nature. This is one of the dilemmas that has emerged when considering modern physics and how to harmonize it with classical mechanics. When a theory does not completely agree with all the evidence, techniques for accommodation can be useful. The use of epicycles by Ptolemy to correct earth centric astronomy worked to a certain degree, but it only focused on the explicate order; perception as a whole must be considered. Therefore, from an implicate point of view, what is the data telling the observer? Bohm argues this is the other half of proper evaluation of scientific data, considering the implicate order.⁶⁷

This is useful for the assessment performed in this dissertation. The goal is to consider both explicate and implicate order in human molecular biology. Without doing this, one can easily fall into a Ptolemaic dilemma, creating systems to align with an incomplete explicate order

⁶⁶ David Bohm, *Wholeness and the Implicate Order* (New York: Routledge & Kegan Paul, 1980), 189-190

⁶⁷ *Ibid.*, 177-182

model. For Ptolemy, this consisted of creating epicycles to align astronomical predictions to an incomplete earth centric solar system model and failing to grasp the big picture of a sun centric solar system. However, if one takes into account theological knowledge and insight, then one has a better chance at seeing the big picture of reality (plus recognizing a broader ontology), which ultimately results in a more accurate view of molecular biological order. This will prove to be an important outcome of applying theological insight to science.

Evaluation Criteria 3: Explanatory Filters and Inference to the Best Explanation

This third criteria considers how to frame information that may have elements that extend beyond empirical scientific results and evaluate how to align empirical and non-empirical information for assessments. This is done by considering filters, or alternatively, gates, in a decision tree. There are four levels of filters used to assess when there is a need for added domain scope in order to see how sensitive the major elements are in the data via sensitivity analysis, to support analyses of alternatives, and to evaluate the utility of experimental designs. This four-level process is summarized below.

First, the *explanatory filter* evaluates how well the current theory explains the experimental results. It does this in light of both scientific and theological sources of knowledge. It seeks to quantify what may not be explained adequately with the existing theory. It allows for both physical and nonphysical sources of knowledge.

Second, there is the *domain filter*. If the first filter identifies a potential shortcoming of the theory when only the scientific method is applied, then the next step is to determine whether the inclusion of the theological domain would help. What aspects of theological method are useful? For example, do natural law theories that expound on God's character in light of creation

offer an approach worth considering that might inform specific lines of experimentation or analysis?

Third, the *sensitivity filter* seeks to find principle components in the data that seem the most promising and can be captured in an experimental design. This allows theological modes of thinking to be actively involved in the discovery process by helping one select a line of argumentation that might not be obvious if one only considers methodological naturalistic approach.

Fourth, the *explanatory filter* seeks to quantify-specific phenomena that support a line of argument that has been identified at a high level in the third filtering step of sensitivity analysis.

1. *Explanatory filter*: how well does the current theory perform?
 - a. How well does the current approach explain the data?
 - b. What assumptions are required to make it valid?
 - c. What alternative theories exist? What is not explained?
2. *Domain filter*: should the scientific method be augmented with theological method?
 - a. Can one determine if the theory is reality or just a well thought out hypothesis?
 - b. If things are not explained does the theological method help?
 - c. What possible sources of truth, knowledge, information, and insight could help?
 - d. How might this be useful?
 - i. Biomimicry: leverage nature design techniques in man-made products
Theo-mimicry: this is coining a term to capture where one notices theological principles found in nature
 - ii. Symphonic filtering methodology: Assessment of Scriptures that follows a particular theme
3. *Sensitivity filter*: what are the principle components to study?
 - a. Functional decomposition: what are the major elements to analyze?
 - b. Principle component analysis: what is the most significant element that should be focused on?
4. *Characterization filter*: what known signatures are present?
 - a. What “design pattern” or template concepts should be recommended for analysis and design of experiments?
 - b. Build a reference library over time of characteristics to consider

Moreover, this dual domain approach provides a larger set of tools to objectively conduct analyses of scientific findings. This is another endeavor, analyzing experimental results to see if the findings make sense and if they correspond with reality based on the larger explanatory scope

that is available through the inclusion of theological and scientific methodologies. Understanding rich information sources like those found in genomes is a good example. This approach could provide justification for efforts to search the genome for higher-level non-structural elements like conformity to specific design pattern rules. In genomics, this could be a focus area within bioinformatics, or a tool used in sequence assessments. Examples of initial questions to evaluate scientific findings are: Where did the information come from? What is the information content? How should the information be examined? What do results mean? What organizational principles can one make from the information analysis?

It is useful to point out there are previously developed ideas that this approach leverages. One assessment approach developed by William Dembski is used here. The *explanatory filter* described above is based upon Dembski's methodology.⁶⁸ As a criterion for detecting design, specified complexity enables one to decide which of these modes of explanation apply. Specified complexity is assessed by answering three questions: Is it contingent? Is it complex? And is it specified? For contingency, Dembski argues a materialistic definition of contingency, as chance governed by probability is inadequate. Instead, contingency should be evaluated as a derivative of intelligence.⁶⁹ For complexity, Dembski considers this an evaluation of information, usually done via probabilistic techniques.⁷⁰ For specified, Dembski considers whether or not there is an unambiguous role or function a design feature might possess.⁷¹ Putting these three together, one can consider if something has contingent specified complexity. By arranging these questions

⁶⁸ William Dembski, *Being as Communion* (Burlington, VT: Ashgate Publishing, 2014), 270-272.

⁶⁹ *Ibid.*, 155-157.

⁷⁰ *Ibid.*, 184-185.

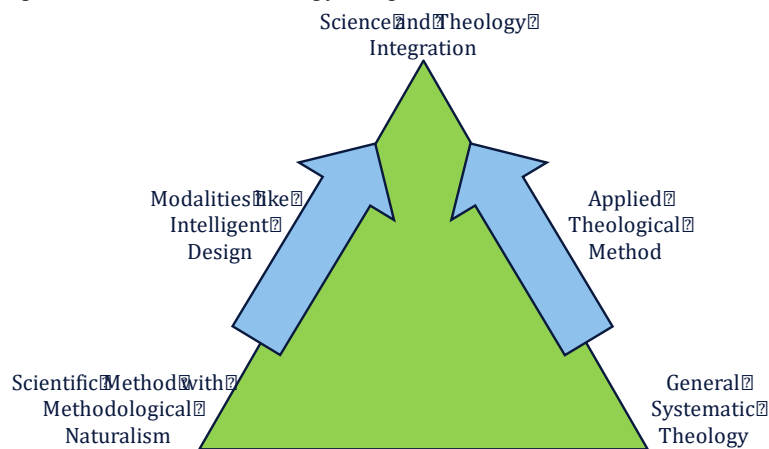
⁷¹ *Ibid.*, 76-81.

sequentially as decision nodes in a flowchart, one can represent specified complexity as a criterion for detecting design and, subsequently, form an evaluation methodology.

Triangulation

An application of triangulation is shown in Figure 2, which illustrates what could happen as a result of a cooperative engagement between scientific ideas and theological insights. For example, how could the implications of *Imago Dei* be coupled into assessing scientific data or suggesting new research experiments to gain insight into possible ways this might be expressed in aspects of biology? Here, triangulation, as suggested by Paul Nelson, can be used productively in scientific assessment and exploration.⁷² If theology and science can help each other, then perhaps there is a triangulation concept that may be applicable. The scientific method, using methodological naturalism, is in one corner, and theology is in another corner. Moving up the scientific path is intelligent design. This assumes a minimal integration of theological principles. More specific theological integration moves science up further on the science scale.

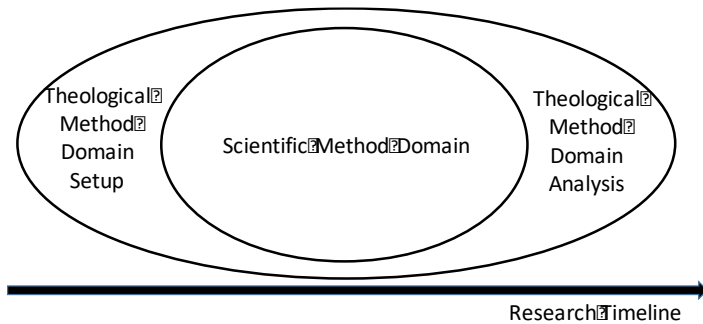
Figure 2. Science and Theology Integration



⁷² Paul Nelson, “Design triangulation.” In 2016 Conference on Alternatives to Methodological Naturalism, video. www.youtube.com/watch?v=rNY_i1kJAnk, accessed February 20, 2019.

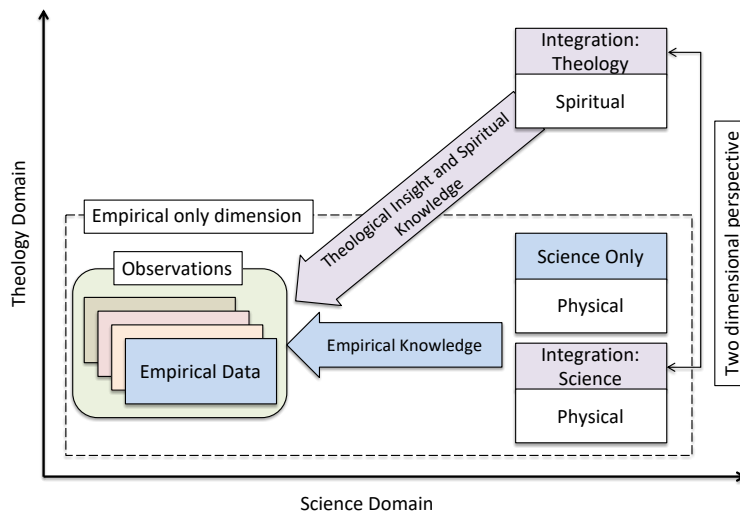
The theological method can be a tool to help guide scientific endeavors, set up and define experiments, and extend what can be understood by them. My claim is that there are consistent laws of nature that are natural outcomes of a theological perspective. Figure 3 shows how the theological and scientific methods can vary in significance during the research timeline. In the beginning and towards the end, the theological method can have a greater impact.

Figure 3. Science and Theology Collaborative Methods Emphasis in Research Timeline



Finally, in terms of perspective, Figure 4 illustrates how when using both the scientific and theological domains, one has a better vantage point to see beyond a limited human perspective. When epistemological dualism falls short there is a desire to find answers from a fuller implicate order understanding, and this is explored in this dissertation.

Figure 4. Leveraging Theological and Scientific Domain Knowledge



Evaluation Criteria 4: Abduction and Aesthetic Awareness

The fourth criteria considers abductive arguments and aesthetic awareness. Before one forms an inductive or deductive argument, one starts with an abductive sense for a direction (one could consider this a hunch or gut feeling); one wants to move in.

Beauty can be hard to define, but everyone knows it when they see it. The exploration of God's beauty was a key part of theological investigation for an extended period, but it lost its significance in recent centuries. Fortunately, thanks to a few key theologians (notably Hans Urs von Balthasar), it gained some of its former significance in the 1800s.⁷³ Von Balthasar is a significant proponent of the importance of beauty and is useful in establishing awareness of aesthetically pleasing pursuits. Treier comments on the importance of beauty in theology:

After a period of considerable neglect in modern religious thought and church culture alike, beauty has begun to reclaim its rightful place in the larger scheme of Christian theology. For many centuries, along with goodness and truth, it formed part of the triad of transcendental ideals that the Christian tradition inherited from the classical age and appropriated for its own uses. From the beginning of the Christian era to the dawning of the modern world, a rough consensus about the interrelationships of beauty, truth and goodness governed Western conceptions of everything from the workings of language to the intricacies of creation and the mysteries of providence. "Beauty is the splendour of truth," observes Stephen Dedalus in James Joyce's *A Portrait of the Artist as a Young Man*, and to explain his passion for beauty, Stephen draws upon the thought of Plato, Aristotle and Thomas Aquinas, among others. In doing so he crisply outlines the synthesis of nature and grace that for centuries had assured beauty of a central role in Christian reflection on the nature of God and the drama of redemption. Under a number of pressures, that synthesis gave way in the early modern period, and the theological interest in beauty entered a period of slow but steady decline.⁷⁴

Walton suggests that abduction is the process of forming an explanatory hypothesis. It is an approach to narrowing down the number of alternatives by selecting only a few hypotheses. It

⁷³ Hans Urs von Balthasar, *The Glory of the Lord: A Theological Aesthetics*. 7 volumes, (San Francisco: Ignatius Press, 1982-1989).

⁷⁴ Daniel Treier. Mark Husbards, Roger Lundin, *The Beauty of God: Theology and the Arts* (Downer Grove, IL: InterVarsity Press, 2007), 7.

is also a means of guessing the right choice between competing hypotheses, and it is used when a new phenomenon that has not been explained is encountered.⁷⁵

All cultures see and are drawn to beauty. With this in mind, Davis develops the understanding of abduction and the aesthetic order. He concludes that one can make the following claim based on two premises: First, all human cultures possess the ability to apprehend aesthetic value. Second, the best explanation for this ability is supernatural causation. Therefore, God's existence (and more) is the supernatural cause of man's ability to understand and appreciate aesthetic value.⁷⁶

CHAPTER 4: ANALYSIS AND SYNTHESIS

Overview

This chapter will analyze and synthesize the material relevant to answering the research questions associated with this project. There are three threads examined here, each building on what has been covered up to that point. Since this is an interdisciplinary dissertation, I will attempt to provide enough introductory explanation so that a reader from any discipline can understand the big picture that is being addressed. However, I will also attempt to be rigorous enough in each discipline and show enough detail from current scholarship in each area in order to demonstrate an effective understanding from each of these disciplines' point of view. In addition, contemporary scholarship from journals and research consortiums are used.

First is the theological section on creation and the *Imago Dei*. Is there consensus of opinion among theologians of various persuasions in regard to the *Imago Dei* and sin? This

⁷⁵ Douglas Walton, *Abductive Reasoning* (Tuscaloosa: The University of Alabama Press, 2005), 8.

⁷⁶ Walter Davis, "Humanity's Capacity to Apprehend Aesthetic Value as an Argument for God's Existence," (PhD diss., Liberty University School of Divinity, 2016), 169.

section discusses what various theologians consider are the meaning and implications of *Imago Dei* and the doctrine of sin. This includes proposing key anthropological takeaways from key theologians who have written on *Imago Dei* and the roles man plays as an imager bearer of God. The nature of sin and the fall into sin are also considered, as man is both an image bearer of God and caught in a struggle with the effects of sin. This information and analysis is consolidated in the attempt to use it for the next two sections. Pannenberg argues that understanding the anthropological nature of man requires an examination via historical science and human biology.

Second, twenty-three individuals from Scripture and the early church are examined in order to assess their activities as image bearers and innovation champions. What do scholars and the examples of the innovation champions reveal about man's *Imago Dei* calling from their own engagements with their particular spiritual social networks, their family and community, and their culture at large? This includes an element of anthropological examination using Pannenberg's suggestion of looking at historical science.

Third, the influence of the *Imago Dei*, sin, and spiritual social networks on human biology will be addressed. Published scientific results will be evaluated along with the analysis done in this dissertation of scientific data from molecular biology, genetics, and epigenetics. This includes an element of anthropological examination similar to what Pannenberg recommends in human biology, showing the unique features that are only found in human beings and how they tie into man's *Imago Dei* mission.

Finally, the results from the three research areas of looking at the *Imago Dei*, surveying the lives of Biblical and Early Church Father's lives, and analyzing alcohol metabolism with epigenetic adaptation that shows an example of biological redemption will be synthesized. It will show how findings from the three areas work together to answer the research question for this

dissertation, which is: *Can one, by looking at scientific and anthropological data with a theologically-informed perspective, identify evidence that shows God's redemption?* It shows how an anthropological understanding of mankind through historical science and human biology provides evidence for biological redemption.

PART 1: Theology of Creation and *Imago Dei*

Introduction

The purpose of this section is to outline a theology of creation and of the *Imago Dei*. It also suggests possible points that a theologically-informed researcher could use when seeking to uncover and explain aspects of the created order.

UNIT 1: Anthropological Insights from *Imago Dei* and Impacts of Sin Doctrines

This section will further examine the insights from the seven theologians that were discussed in the previous chapter. It will summarize their relevant comments on *Imago Dei* and sin. In addition to formulating a theological basis for my analysis, it also acknowledges areas of commonality among the various points of view. While there is not consensus amongst this diverse group of theologians in terms of the biblical authority or even divine (i.e. transcendent) inspiration, there is still agreement on the value of the *Imago Dei* from a cultural and historical point of view.

LeRon Shults and Iconoclastic Theology

In his book *Iconoclastic Theology*, Shults argues for an atheistic theology with a goal of finding an inspiring atheism. He looks at the historical and cultural elements of Christianity that have been inspiring. He tries to determine what motivated those that were key in the formation of Christianity. Then he makes an attempt to find what essence there is that can still be inspiring today, examining human developed elements of imagery and iconic components of theology.

Some would debate whether or not this is possible, and they would argue that having the longing to ponder whose image one reflects or the desire to create gods might reflect evidence of *Imago Dei* in humanity. Thus, even an atheist could stumble on evidence of the *Imago Dei* in mankind, although he or she would not fully develop it to the logical conclusion that a theist would pursue. Below are examples of Shults' thoughts on iconic images as well as his historical and cultural understanding of sin and how it functions in theological models. First, Shults acknowledges the centrality of Christ as the image of God. He concedes the historical and cultural contribution of Christ in a similar manner to how he would hold other significant religious human leaders. In this vein, he describes the iconic Christ from his point of view:⁷⁷

The basic thrust of the entire New Testament is that Christ is the one true image (icon) of the one true transcendent moralistic Entity, the only mediator between humanity and the supernatural Agent he called "Father." During the rise and eventual dominance of what is now called "Neo-Platonism" during the third and fourth centuries after Jesus' death, the notion of Christ as the image of God became even more important ... Nevertheless, Thomas Aquinas's thirteenth-century formulations of Christ as the image of God remained within the Platonic Eidetic framework, presupposing a transcendent model as the ground for selecting among rival images.⁷⁸

Shults claims that the doctrine of the image of God in light of modern biblical textual criticism and scholarship no longer has the force that it once had, and although he acknowledges Jesus' existence, he rejects Christ's divinity. Bringing up a similar point that Middleton develops about man's *Imago Dei* call reflecting man acting as an emissary for a king, Shults concludes that the language used for image of God should reflect a political representative based on the Ancient Near East context. He also brings up a known artifact of the language that was used, but

⁷⁷ LeRon Shults, *Iconoclastic Theology: Gilles Deleuze and the Secretion of Atheism*, 31-32.

⁷⁸ *Ibid.*, 32-33.

based on other relevant scholarship, there is room for the phrase *image of God* to have eschatological and protological elements.⁷⁹

Shults, from a bio-cultural (the scientific exploration of the relationship between human biology and culture) science point of view when examining wisdom traditions, would prefer to adopt the option of a shared imagination describing supernatural agents instead of accepting Christ as a central figure with the sacerdotal trajectory of Christian theology with the image of God.⁸⁰ In other words, Shults rejects the supernatural and instead endorses humanity to create theology and a system of spirituality (a sacerdotal trajectory) without God, including defining what an image of God would mean.

Concerning Christ as the Logos of God, Shults understands the attempt to link Jesus with the divine Logos, as seen in the introduction to the Gospel of John, but he also notes other passages where this is seen as well. From a cultural, historical, and literary point of view, Christ is seen as the ordering principle of creation. Shults acknowledges these cultural and historical ideas but does not endorse them as metaphysical realities.⁸¹

Shults emphasizes the connection between Neo-Platonic metaphysics and Christianity. Even though there have been attempts by theologians to develop Christologies that do not depend on Neoplatonic metaphysics, there still are components of dogmatic images of thought, meaning that one cannot get completely away from having a concept of God. Even in these Christologies, there is the desire to explain Christ as the image of God. Shults notes that any liberal Christian group that embraces a theology that completely removes itself from Christ's

⁷⁹ LeRon Shults, *Iconoclastic Theology: Gilles Deleuze and the Secretion of Atheism*, 33.

⁸⁰ *Ibid.*, 56.

⁸¹ *Ibid.*, 69.

deity tends to lose its cohesion as a religious coalition. Similarly, conservative Christian groups that tenaciously hold to a metaphysically robust view of Christ say the image of God is tightly bound together by belief in the divine and human attributes of Jesus and His place in the trinity.⁸²

Concerning sin, Shults clearly articulates the impact of sin in the debt that man possesses:

Within the sacerdotal (priestly) machines of Christianity, however, the activation of anthropomorphic promiscuity and sociographic prudery is reinforced and intensified, leading to an even more secretive and more powerful form of repression. One of the most important motifs in the Christian doctrine of salvation is the satisfaction of infinite debt. It is taken for granted that such a debt exists; if personal alliances and filiations are managed through debt, it is quite natural to assume that any relation to an infinite Person would involve an infinite debt. Hypotheses about the cause of this debt, and the mode of payment that resolves it, however, have varied significantly over the centuries. Until the nineteenth century, all versions of this motif traced the debt back to Adam and Eve, whose sin placed them in bondage to Satan, the “ruler of this world.” One popular approach during the patristic period was to depict God as paying a ransom (Christ) to Satan, as a Roman general might do to buy back captives after a war.⁸³

Shults also reflects the traditional interpretation (to many, the misinterpretation) of baptism as a means of removing original sin and guilt inherent to the person as a descendent of Adam.⁸⁴ Shults adequately describes the nature of the fall of man in acknowledgement of the historical narrative that exists, although he does not agree that it actually happened.

After their “fall” from a paradisiac state, Adam and Eve were subordinated to the forces of sin and the Devil. All of their offspring are now powerless to resist worldly captivations and demonic captors. On this model, salvation can only be actualized if God defeats these forces and provides new conditions for the freedom of humanity.⁸⁵

In his development of iconoclastic theology, Shults tries to reinterpret many things based on his understanding and methodological and philosophical interpretation of theology and the

⁸² Ibid., 92-93.

⁸³ Ibid., 169.

⁸⁴ Ibid., 170.

⁸⁵ Ibid., 173.

implications of science. The third point he makes is that he hopes to change people's minds about the basis and definition for theology. Yet in the midst of this, Shults still in a sense implicitly acknowledges the cultural and historical impact of Christianity and the importance of the central beliefs of Christ and the *Imago Dei* teachings. He also states how one longs for group identity and to be networked with others. These ideas correlate with elements of *Imago Dei*, where like God in His Trinity, one longs for and is most productive and whole in a community; and in community, finds identity, emotional energy, and inspiration in the midst of a social network. Shults states,

Third, I hope to have demonstrated how fruitful it can be to release the flows of the iconoclastic trajectory of theology by cracking open the arboreal edifices of monotheistic religion with a precision hammering that is even more intense than Deleuze's, thereby increasing the secretion of a productive atheism that liberates thinking, acting, and feeling. Whether or not we call this "theology," it is, as Deleuze would say, interesting and important work to do. Can't we all be Friends? Probably not. The findings of the biocultural sciences suggest that human cognition has evolved in such a way that coalitional binding depends upon widespread anxiety about in-group identity and hostility toward defectors and out-groups. These evolved defaults are deeply embedded in the matrix of psychological and political networks that organize our lives. They have been reinforced by thousands of years of religious entrainment involving shared imaginative engagement with axiologically relevant supernatural agents.⁸⁶

In summary for the purpose of this dissertation, Shults sees value in the historical theological development that has taken place since it has developed a useful system of spirituality that can be beneficial to humanity. He does not think there is any supernatural agency, and the concept of the *Imago Dei* is man-made. Even with this point of view, the fact that he seeks to understand the theological significance of what it means to be created in the image of God shows a veiled desire to understand the things of God.

⁸⁶ Ibid., 195-196.

Wolfhart Pannenberg and Anthropological Theology

In his book *Anthropology in Theological Perspective*, Pannenberg develops his anthropological method in his exploration of traditional dogmatic anthropology and fundamental-theological anthropology. He argues that human existence can be productively investigated by utilizing human biology, historical science, psychology, cultural anthropology, and sociology. Human biology is useful since it deals with human beings at the highest level of generality and delimits the concept of human beings. Historical science is useful since it deals with the concrete lives of individuals and how they interact with their history. The history of humankind comes at the end of anthropological reflection

In the first section of *Anthropology in Theological Perspective*, Pannenberg examines persons in nature. He discusses three theological areas: the uniqueness of humanity, the image of God, and the notions of dominion, duty, and sin. He argues that the uniqueness of the nature of man in terms of God as found in Scripture should be replaced with a dialogue about man in his natural surroundings. With regard to the image of God, man is not like the animals, and there is clear historical and anthropological evidence for this distinction. The image of God guides man and gives him a guide for behavior. Finally, concerning dominion, duty, and sin, Pannenberg suggests that ambiguity in dominion brings ambiguity in behavior. In his second section, Pannenberg discusses humans as social beings and touches upon three areas in which this reality is reflected. First is subjectivity and society, where man finds identity in community but also has to confront situations in which he experiences nonidentity. Second is the problem of identity, where man, in society, has to evaluate how he defines and maintains a sense of identity. Third is identity in affective life, where sin, guilt, and alienation are all forces that confront man that must be dealt with. These have to be considered in the midst of the human ego. In his third section,

Pannenberg deals with man in a shared world. Here he examines man in three different ways. First, through foundations of culture; man has to live and operate in a cultural setting. Second, for the cultural meaning of social institutions; individuals have to determine to what level they embrace that meaning. Third, for human beings in history; this is where Pannenberg looks at historical science and how it is key in an anthropological examination. In a concrete form, historical science can act as validator by looking at specific individuals, peoples, and states.⁸⁷

As discussed in the previous chapter, two central issues in theological anthropology are *Imago Dei* and sin. Pannenberg is convinced that theology can only be understood by including a contemporary intellectual evaluation of the material:

The anthropological concentration in the history of modern theology is therefore not traceable solely to philosophical influences; it has also, and indeed principally, been stimulated by properly theological motifs, although it is only in the recent period that these have exerted their full influence. This makes it clear that this development in theology can be understood only as an expression of the overall intellectual situation in the modern era. The same conclusion follows from the fact that the anthropological concentration in theology has been strongly influenced by the social history of the modern period.⁸⁸

Pannenberg in his introduction discusses his proposed methodology. He questions which disciplines can provide the best groundwork in evaluating the human person. The two disciplines he focuses on for the anthropological investigation of man are human biology and historical science. Human biology can be thought of as a bottom-up approach to characterize the anthropological nature of man, while historical science can be thought of as a top-down anthropological approach. Human biology examines the characteristics of a species and can also provide insight into individual characteristics when one considers molecular biology. Historical

⁸⁷ Wolfhart Pannenberg, *Anthropology in Theological Perspective* (London; New York: T&T Clark, 1985).

⁸⁸ *Ibid.*, 13.

science provides a means to reflect back on how individuals and cultures in a society interact. It examines the evidence of specific individuals and the way they interact in their history.

Unfortunately, this entails abstraction since all the details of one's life cannot be considered.⁸⁹

Instead of starting with theological principles, Pannenberg seeks to find an anthropological basis for the essence of man by examining mankind in the midst of his natural surroundings. This is captured within an assumed evolutionary framework. Scheler argues that man's special place in nature is due to his openness. There is an awareness of influences on man that come from outside of man, and this can be traced to God. Thus, for Scheler, God is essential if one wants to establish the origin of spirit, and accordingly the special anthropological place of man. Pannenberg then points to Plessner, who argues for the exocentric position of mankind, where instead of focusing strictly within for survival, mankind looks outside himself. Man has the ability for self-reflection, which he also calls exocentricity, and to think abstractly about things. As a result of man's exocentricity, man can reason dispassionately about reality and his environment.⁹⁰ Pannenberg further builds upon Herder's point that animal instincts have been replaced by divinely supplied directions for human life. As animal instincts regressed (from his evolutionary paradigm), God put into man a direction of self-improvement to follow. Herder argues that the direction of man's self-improvement is the direction of God's image impressed on mankind.⁹¹ Thus, even from an empiricist and evolutionary framework, this may suggest that Pannenberg argues for the existence of the *Imago Dei* in man.

⁸⁹ Ibid., 21–22.

⁹⁰ Ibid., 36–37.

⁹¹ Ibid., 45.

Pannenberg develops many aspects of his methodology beyond what this dissertation will cover, but in terms of relating that development with what will be done in this dissertation, the comment below will be useful since molecular biology, a part of analyzing human biology, will be explored. Pannenberg argues that human biology is key for complete anthropological investigation of man, and this dissertation will develop a new area that increases the biological evidence:

From this point of view, the fundamental anthropological discipline is the one that deals with humans beings at the highest level of generality and thus first delimits the concept of human being, even if at the cost of remaining very abstract. That discipline is human biology.⁹²

In summary, Pannenberg provides a useful two-pronged imperative for one to gain an effective anthropological understanding of man. One should consider what he or she knows of mankind by looking at history through what he calls historical science. Moreover, one should look at the evidence of human biology. Both of these subjects will be considered later in this dissertation.

Pope John Paul II and the Theology of the Body

Over a four-year period, Pope John Paul II spent a significant amount of time during weekly addresses exploring the theology of the body and its implications within the sacrament of marriage. More specifically, these implications pertained to the incarnation, the original meaning of the body, the redemption in the body, and in the image of God seen within marriage. These will be highlighted below.

First, what did John Paul II think about the incarnation and the body? Clearly, he thought one should include the body in complete theological discussion.

⁹² Ibid., 22.

The fact that theology also considers the body should not astonish or surprise anyone who is aware of the mystery and reality of the Incarnation. Theology is that science whose subject is divinity. Through the fact that the Word of God became flesh, the body entered theology through the main door. The Incarnation and the redemption that springs from it became also the definitive source of the sacramentality of marriage, which we will deal with at greater length in due time (Wednesday Audience on April 2, 1980).⁹³

John Paul II invites readers to think of life in the Garden of Eden with this theological prehistory and the experience man had in the body:

Through the category of the historical a posteriori, we try to arrive at the original meaning of the body. We try to grasp the connection existing between it and the nature of original innocence in the “experience of the body,” as it is highlighted in such a significant way in the Genesis narrative. We conclude that it is important and essential to define this connection, not only with regard to man’s “theological prehistory,” in which the life of the couple was almost completely permeated by the grace of original innocence. We must also define this connection in relation to its possibility of revealing to us the permanent roots of the human and especially the theological aspect of the ethos of the body (Wednesday Audience on February 13, 1980).⁹⁴

Another important area to address is the redemption of the body. John Paul considers this in the context of marriage and resisting the temptation to act out in lust. Marriage allows man a forum to be fulfilled sexually while also being faithful to how individuals should operate as image bearers of Christ:

To understand all that the redemption of the body implies according to Paul’s Letter to the Romans, an authentic theology of the body is necessary. We have tried to construct this theology by referring first of all to the words of Christ. The constitutive elements of the theology of the body are contained in what Christ says: in recalling “the beginning,” concerning the question about the indissolubility of marriage (cf. Mt 19:8); in what he says about concupiscence, referring to the human heart in his Sermon on the Mount (cf. Mt 5:28); and also in what he says in reference to the resurrection (cf. Mt 22:30). Each one of these statements contains a rich content of an anthropological and ethical nature. Christ is speaking to man, and he is speaking about man: about man who is “body” and who has been created male and female in the image and likeness of God. He is speaking about man whose heart is subject to concupiscence, and finally, about man before whom

⁹³ Pope John Paul II, *The Redemption of the Body and Sacramentality of Marriage* (Vatican: The Catholic Primer, 2006), 59-60 (April 2, 1980), accessed May 29, 2019, https://d2wldr9tsuuj1b.cloudfront.net/2232/documents/2016/9/theology_of_the_body.pdf.

⁹⁴ Ibid.

the eschatological prospect of the resurrection of the body is opened (Wednesday Audience on July 21, 1982).⁹⁵

John Paul suggests that within marital union man can experience an aspect of *Imago Dei* by sharing love and intimacy, and also in having the potential to procreate and fill the earth:

Following the narrative of Genesis, we have seen that the "definitive" creation of man consists in the creation of the unity of two beings. Their unity denotes above all the identity of human nature; their duality, on the other hand, manifests what, on the basis of this identity, constitutes the masculinity and femininity of created man. This ontological dimension of unity and duality has, at the same time, an axiological meaning. From the text of Genesis 2:23 and from the whole context, it is clearly seen that man was created as a particular value before God. "God saw everything that he had made, and behold, it was very good" (Gen 1:31). But man was also created as a particular value for himself - first, because he is man; second, because the woman is for the man, and vice versa, the man is for the woman (Wednesday Audience on November 14, 1979).⁹⁶

John Paul II argues for the value of including the body in one's theology. One's theology is not complete if he or she does not include the role of the body in the incarnation, the theological prehistory in the garden, man's redemption, and the union of bodies in marriage.

John Frame and His Views on the Three Offices Associated with the *Imago Dei*

In Frame's *Systematic Theology*, his detailed theological work, he discusses the three roles in which mankind operates as image bearers of Christ. Frame notices two things in the Genesis passage on the creation of man. First, there is a distinctive manner in God's counsel for man that informs his view of the *Imago Dei*. God states in this passage that God made mankind after God's likeness. This is different from what he states about the animals who are made according to their kind, following a pattern prescribed by God. But the pattern for mankind is the image of God. Frame notes that "in our image" and "after our likeness" are roughly the same concept in Hebrew. In the Ten Commandments, it is clear that there are supposed to be no man-

⁹⁵ Ibid., 221-222

⁹⁶ Ibid., 24.

made images of God, since the one image of God that one finds in ourselves, as individuals are the image bearers of God. Part of man's image of God calling includes qualities that authorize man to be lord of the world under God. These qualities have analogies with God's Lordship attributes.

Frame discusses three particular lordship attributes and their resulting anointed offices presented in Scripture: king, prophet, and priest. God, and in particular, Christ, the Anointed One, modeled these roles for man. In nature, man has an analogous position to Christ in his *Imago Dei* roles, and has a clearly different role as compared to other animals. One also sees as redemptive history continues that God appoints specific individuals to be kings, prophets, and priests for his people.⁹⁷ Concerning the kingly office, which deals with control, Frame summarizes the following:

In Genesis 1:26, the image of God equips man to exercise great power: "And let them have dominion over the fish of the sea and over the birds of the heavens and over the livestock and over all the earth and over every creeping thing that creeps on the earth." In verse 28, God says that to have dominion over the earth, man will have to "subdue" it (kabash, "make subservient"). This dominion extends to everything God made in the fourth through sixth days of creation. ... So man's dominion does not extend to the work of God's first two creative days. But the fact that he subdues and rules the creations of the last four is immensely significant. Man is not omnipotent as God is, but he is able to accomplish amazing things by his physical strength, intellectual acuity, and linguistic ability ... abilities that no animal can match.⁹⁸

Frame, in a similar fashion to several other theologians discussed here, acknowledges the contribution of the body in man's ability to fulfill his role as image bearer of Christ:

Theologians have asked whether the image of God pertains to man's body or only to his soul ... it should already be evident that the image of God does pertain to the body. Man's physical strength is a major aspect of his power to subdue the earth and take dominion of it. Some have objected that the human body cannot be God's image because God is incorporeal. But God's incorporeality does not mean that he can never take

⁹⁷ John Frame, *Systematic Theology*, 784-786.

⁹⁸ *Ibid.*, 786-787.

physical form, only that he is sovereign in his choice of whether or not to take a physical form; and if he chooses to take one, he is sovereign in choosing the form he takes.⁹⁹

Frame further considers the prophetic office, which deals with the role of having authority. This involves the manner in which one constructs our culture in accordance with the standards of God. In this office as image bearers, one brings God's Word, God's language, to other individuals and to the world.¹⁰⁰

The third office is the priestly office, which Frame argues includes the concept of presence. Frame points out how this office includes mankind's mandate to be fruitful and multiply, and to fill the earth. One can have a presence everywhere by filling the earth.

But Adam is not to be an absentee king. He is not only to subdue the earth and have dominion over it, but also to "be fruitful and multiply and fill the earth" (Gen. 1:28; cf. 9:1). As God transcends the world by his control and authority, but becomes immanent in the world by his covenant presence, so Adam, God's vassal king and prophet, is to fill the world over which he rules. Since he is not omnipresent as God is, he can fill it only by marrying and having children.¹⁰¹

In summary, Frame highlights the three roles individuals have in man's *Imago Dei* calling. Individuals have a mission that God wants them to fulfill. In the office of king, individuals are called to execute kingly control. In having dominion over the earth and subduing it for the Lord's purposes. In the office of prophet, individuals are called to use prophetic authority to encourage society to act in accordance to God's will and law. In the office of priest, individuals are to extend a priestly presence to the ends of the earth by filling the earth so that everywhere there will be an imager bearer of God.

⁹⁹ Ibid, 787-788.

¹⁰⁰ Ibid., 788.

¹⁰¹ Ibid., 790.

Wayne Grudem and His Views on the *Imago Dei*

Grudem's widely used and very accessible systematic theology work is presented in a manner in which the casual reader can come to a comprehensive understanding of theological principles, put in layman's terms, yet with scholarly references. As a part of this work, Grudem deals with the meaning of the image of God and the ramifications of the fall. In terms of the meaning of the image of God, Grudem tinkers with the insights of other theologians like Frame, who argues that mankind is the only creature that is said to be made in the image of God. In general, this means that man is like God and represents God. Grudem suggests it is not necessary to derive theological understanding strictly from the Genesis passage since it is laid out in the rest of Scripture. It is sufficient at this point to acknowledge that this is the case. Another common consideration is whether man can still be in the image of God after he sinned.¹⁰²

Grudem suggests that God's image may be distorted but is not lost:

We might wonder whether man could still be thought to be like God after he sinned. This question is answered quite early in Genesis where God gives Noah the authority to establish the death penalty for murder among human beings just after the flood: God says "Whoever sheds the blood of man, by man shall his blood be shed; for God made man in his own image" (Gen. 9:6). Even though men are sinful, there is still enough likeness to God remaining in them that to murder another person (to "shed blood" is an Old Testament expression for taking a human life) is to attack the part of creation that most resembles God, and it betrays an attempt or desire (if one were able) to attack God himself. Man is still in God's image. The New Testament gives confirmation to this when James 3:9 says that men generally, not just believers, "are made in the likeness of God."¹⁰³

For the purposes of this dissertation, this short section on Grudem's views of the *Imago Dei* is enough. Grudem is a frequently used reference for teaching the evangelical theological

¹⁰² Wayne Grudem, *Systematic Theology*, 442-443.

¹⁰³ *Ibid.*, 444.

position and reflects the common evangelical consensus opinion on the *Imago Dei* and the effects of sin. For completeness purposes, it is important to include this kind of reference.

John Kilner and His Views on Humanity in the Image of God

Kilner agrees that individuals are created in God's image. This starts with Adam and Eve. In terms of priority, God wants man's primary focus not on creation, but on Christ; individuals bear the image of Christ. Yet even more than this, God wants man to live in the image and reflection of Christ. This brings about renewal and revitalization, not only in man personally but in man's communities. Kilner has a straightforward way of understanding what image means. He states, "Simply put, image is about connection in a way that may also involve reflection. Being the image of God turns out to mean having a special connection with God and indeed being a meaningful reflection of God."¹⁰⁴ Kilner elaborates on what he sees as our purpose of holding God's image:

The New Testament reveals that God was engaged in planning before the beginning (e.g., see Titus 1:2; 2 Tim. 1:9; 1 Cor. 2:7). In fact, God had a "purpose" (the language of Rom. 8:28 and elsewhere) that included creating humanity with a dignity and a destiny bound closely with Christ, whom the Bible calls God's "Son." God intended that people would fulfill their purpose as created "in" God's image by developing toward the fullness of what God's image entails ... This was God's desire — that none would perish (1 Tim. 2:4; 2 Pet. 3:9) — in a way that was in harmony with God's own sovereign will.¹ God foreknew that all people would reject the divine purpose for them, yet God would not let people, sin, or Satan have the last word.¹⁰⁵

Christ is the enabler and ultimate standard of God's image. According to Kilner, this is a good reminder when one has to face sin:

Because of sin, humanity is not able to live out God's intentions for people created in God's likeness-image. Christ, however, can live them out precisely because Christ is fully God and free from sin. If humanity is not only to be created according to the standard of God's image but is also actually to fulfill God's intention for people,

¹⁰⁴ John Kilner, *Dignity and Destiny: Humanity in the Image of God*, 54.

¹⁰⁵ *Ibid.*, 52.

something must be done about sin. Christ is God's gift to humanity, not simply as the image of God, but also as the likeness of humanity and provision for sin. Without Christ as the image of God and the likeness of humanity, humanity's destiny as God's likeness-image could never be fulfilled.¹⁰⁶

Kilner states that God's image is something that people can see in their bodies. It is important, therefore, that one considers the whole person:

Seeing in these Genesis texts the idea that being in God's image is primarily about the body is going too far (see more below). Nevertheless, these texts together suggest the idea that the body is part of a larger whole. Creation in God's image includes the whole person — or viewed corporately, includes all of humanity.¹³⁹ There is no dichotomy of body and spirit here.¹⁴⁰ There is a union or, better, a unity of the person here.¹⁴¹ People do not have bodies; they are bodies (though not just bodies).¹⁴² In other words, as noted earlier in Chapter 3, the concept of God's image includes the body, along with every other aspect of being human as God intends it.¹⁰⁷

Kilner argues for the importance of the *Imago Dei* and the contribution of the body. One can see the image of God in our bodies. The inclusion of a theology of the body is useful for this dissertation, and it will help us develop an implicate understanding of the implications for how one metabolizes alcohol and recovers. There are ethical implications of people being made in the image of God and how one should value all of humanity. One must consider the whole person at all times.

Richard Middleton and His Old Testament Insights on the *Imago Dei* in Genesis 1

Middleton suggests an interdisciplinary approach in the interpretation of the *Imago Dei*. In order to get a full understanding of the *Imago Dei*, one must consider both the writings of systematic theologians and the massive literature in Old Testament scholarship. The first concern that Middleton points out is the fact that the semantic range of *selem* for the Hebrew word *image* in Genesis 1 includes the English "idol." Shulze, as discussed above, also points this out along

¹⁰⁶ Ibid., 69.

¹⁰⁷ Ibid., 305-306.

with the fact that an image would typically be dealing with royal functions, as is elaborated in Old Testament contexts:¹⁰⁸

Although its semantic range is broader than this single meaning, we need to account for *šelem* in many contexts clearly referring to a cult image, which in the common theology of the ancient Near East is precisely a localized, visible, corporeal representation of the divine. A basic word study would thus lead to the preliminary observation that visibility and bodiliness may well be important for understanding the *Imago Dei* and that this dimension of its meaning should not be summarily excluded from consideration.¹⁰⁹

The emphasis that is seen among Old Testament scholars is the importance of proper interpretation:

This virtual consensus is based on a combination of two factors. The first (less prominent) factor is exegesis of Genesis 1:1–2:3, the textual unit that forms the immediate literary context of 1:26–27. Such exegesis notes the predominantly royal flavor of the text, beginning with the close linkage of image with the mandate to rule and subdue the earth and its creatures in 1:26 and 1:28 (typically royal functions). But beyond this royal mandate, the God in whose image and likeness humans are created is depicted as sovereign over the cosmos, ruling by royal decree (“let there be”) and even addressing the divine council or heavenly court of angelic beings with “let us make humanity in our image,” an address that parallels God’s question to the seraphim at the call of Isaiah: “Whom shall I send? And who will go for us?” (Isaiah 6:8). Just as Isaiah saw YHWH “seated on a throne, high and exalted” (6:1), so the writer of Genesis 1 portrays God as king presiding over “heaven and earth,” an ordered and harmonious realm in which each creature manifests the will of the creator and is thus declared “good.” Humanity is created like this God, with the special role of representing or imaging God’s rule in the world.¹¹⁰

Middleton goes on to show that there is a near consensus among Old Testament scholars regarding the Ancient Near East background for the *Imago Dei*, a background that would point to the notion of an earthly king claiming his dominion, who would then place an image of himself in their empire in places where he would not personally appear. Thus, they would have an image

¹⁰⁸ Richard Middleton *The Liberating Image: The Imago Dei in Genesis 1*, 16-17.

¹⁰⁹ *Ibid.*, 17.

¹¹⁰ *Ibid.*, 17.

or emblem of the king placed in various parts of his domain. This image of the sovereign would show subjects the authority of the king when he was not there. This idea aligns with what is being conveyed within the idea of *Imago Dei* as revealed in Genesis 1.¹¹¹

Middleton suggests that the proper hermeneutical understanding of acting as an emissary of the king provides insight into understanding the *Imago Dei*. Metaphysically speaking, instead of focusing on substance, which emphasizes the image of an analogy of being, or relational, which emphasizes the image of a personal encounter, Middleton suggests a functionalistic interpretation, which focuses on the image of mediation of (causal and creative) power. Thus, Middleton argues, “the *Imago Dei* designates the royal office or calling of human beings as God’s representatives and agents in the world, granted authorized power to share in God’s rule or administration of the earth’s resources and creatures.”¹¹² Finally, Middleton provides some additional insight into rulership that is a part of been an image bearer. This aligns with the offices that Frame discusses the above:

Since the main function of divinity in both Israel and the ancient Near East is precisely to rule (hence kings were often viewed as quasidivine), it is no wonder that Psalm 8 asserts that in putting all things under their feet and giving them dominion over the works of God’s hands, God has made humans “little less than ’ēlōhîm” (8:5–6 [MT 8:6–7]). It does not matter whether ’ēlōhîm is translated “God” or (with the Septuagint) “angels,” the meaning is virtually unchanged. In the theology of both Psalm 8 and Genesis 1, humans (like the angelic heavenly court) have been given royal and thus godlike status in the world.¹¹³

In summary, Middleton stresses the meaning of the *Imago Dei* within the context of the Old Testament. From this assessment of Middleton, one gets a clearer understanding of the

¹¹¹ Ibid., 17-18.

¹¹² Ibid., 18.

¹¹³ Ibid., 18.

Genesis account and its intent for *Imago Dei*. Middleton's recommendation for a hermeneutical context one should use for interpreting the author's intent for the Genesis concept of the *Imago Dei* helps one see the meaning the *Imago Dei* conveys for individuals to have the authority to represent God our king and be his emissaries wherever one goes.

Conclusions from *Imago Dei* and the Impact of Sin

From these seven contemporary theologians, one sees an array of distinct opinions. Still, there is a level of common ground where they all embrace at least at a cultural and historical level the centrality of the *Imago Dei* and the reality of sin and its effects. These two areas will be considered as one assesses individuals operating in *Imago Dei* roles and within the authority suggested by the Genesis narrative. This will include examining aspects of human biology, specifically in the molecular biological area. This is done in an effort to gain insight into measurable biological components that support man's *Imago Dei* calling and the availability of redemption and recovery from the effects of sin.

UNIT 2: Characterizing the Impacts of Sin and the Fall

Introduction

This section summarizes a conservative evangelical position on the nature of creation, sin, and the fall. From this framework, it develops what might be possible outcomes that perhaps have signatures that one could observe or measure in nature. Within this epistemic context, this section attempts to provide an explanatory context for the implications and outcomes due to man's fall from an original state of grace. The impact of this fall is the most tragic event in human history. At a fundamental level, much about human nature changed after this fall. Although man looked physically the same right after the fall, there was a line that was crossed that could not be undone. As a result of these changes, human beings had to deal with the

awareness and presence of evil, physical decline from aging, alienation from God, the loss of free fellowship with God (i.e. spiritual death), and a new self-imposed existence in a rebellious state of mind. The Genesis account hints at man's nature before the fall and how it was restricted after. In Eden, Adam felt emotions, like loneliness, before receiving Eve. Adam was physically strong and capable. Spiritually, he was completely connected with God, and having good mental capabilities was able to work in creation and name the animals. Pannenberg suggests that by man naming the animals, he could grasp external reality, and by participating in the divine Spirit, he could grasp the nature of things.¹¹⁴ Adam was emotionally connected with God, Eve, and creation. Perhaps a molecular biological mechanism that was being adapted in a new way was epigenetics, in which cellular function was being turned on and off in new ways. This will be examined in more detail later in PART 3: Redemptive Evidence

The Fall

Man chose rebellion by disobeying God and following the advice of Satan. Getting knowledge through rebellion was not what God intended. Hodge argues that the Tree of Life and the Tree of Knowledge were next to each other in the center of the garden: "Out of the ground the Lord God caused to grow every tree that is pleasing to the sight and good for food; the tree of life also in the midst (*tavek* – midst, middle, among) of the garden, and the tree of the knowledge of Good and Evil (Gen 2:9)."¹¹⁵ The Tree of Knowledge in the Garden of Eden contained knowledge of Good and Evil. God told Adam and Eve that they could eat from any tree except the Tree of Knowledge. If the Tree of Life and the Tree of Knowledge were both in the center of

¹¹⁴ Wolfhart Pannenberg, *The Historicity of Nature* (West Conshohocken, PA: Templeton Press, 2007), 113-114.

¹¹⁵ Charles Hodge, *Vol. 2: Systematic Theology* (Oak Harbor, WA: Logos Research Systems, Inc. 1997), 123-149.

the garden, they both would have been observed on a regular basis as man ate from the Tree of Life and refrained from eating from the Tree of Knowledge. So, Adam and Eve knew about the existence of Good and Evil, but in their naïve state, they had no experiential understanding of what this could mean. At most, this was a purely propositional knowing of what moral evil and moral good were like. Nagel points out the significance of consciousness in the context of the mind-body problem discussions. Like Pannenberg, Nagel points to the fact that human mental faculties do not fit with a reductionist interpretation, and a reductionist interpretation does not reflect the experience of Adam and Eve.¹¹⁶

Hodge suggests that the nature and significance of the Tree of Knowledge of Good and Evil are not clear. He argues that the Tree of Knowledge was designed to pass on knowledge, and eating of the tree would open one's "eyes" to that knowledge. Because of Satan's bidding, Adam and Eve decided in their disobedience to gain wisdom. Unfortunately, as a result, man became like God in one small way by having the capacity to know both good and evil and to have a real experience where this happened.¹¹⁷

Hatchett argues the knowledge of Good and Evil would make man godlike in some manner (Gen. 3:5, 22). Others think the tree held all knowledge for the complete range of human experience, and the tree offers moral knowledge. Still, others claim that the knowledge was focused around sexual experience. In the passage context, the tree embodied an object and symbol of God's authority. Hatchett points out that the tree should have made Adam and Eve remember that their freedom was conditional upon God. In rebellion, Adam and Eve sought

¹¹⁶ Thomas Nagel, "What Is It Like to Be a Bat?" *The Philosophical Review* 83, no. 4 (1974): 435-450, accessed June 5, 2019, <http://links.jstor.org/sici?sici=0031-8108%28197410%2983%3A4%3C435%3AWIILT%3E2.0.CO%3B2-Y>.

¹¹⁷ Charles Hodge, *Vol. 2: Systematic Theology*, 123–149.

independence that only belongs to God, and their ambition impacted all aspects of human experience. They thought they had the right to decide what is good and evil, and one could argue that this concept has never found intellectual consensus, and this attitude at least contributes to tragic results in human history.¹¹⁸ A discussion of moral system development is out of scope here, but there are various, and often incompatible, moral systems that have been proposed over the centuries following this approach, including Utilitarianism, Social Contract Theory, Deontological Ethics, Kantian Ethics, Virtue ethics, etc. They give concrete examples of the real outcome of man's fall from grace.

Adam and Evil were tempted and acted upon that temptation. Satan's deception of Adam and Eve in the garden led to a severe disjunction between man's nature and function prior to the eating from the tree and after gaining the knowledge of Good and Evil. Yet, God offers a path to redemption.¹¹⁹ This graceful response from God will be explored more in this dissertation, including how human biology acts a part of redemption.

Curses on Earth

Adam's plight now included dealing with natural evil. God told Adam the unfortunate consequences of his curse were "Because you have ... eaten from the tree about which I commanded you, saying, 'You shall not eat from it'; cursed [*arar* – to bring on a curse] is the

¹¹⁸ Randy Hatchett, "Fall," *Holman Illustrated Bible Dictionary*, ed. Chad Brand, Charles Draper, Archie England, (Nashville, TN: Holman Bible Publishers, 2003).

¹¹⁹ Charles Hodge, *Vol. 2: Systematic Theology*, 123–149. As Hodge conveys, as well as key highlights from the Genesis account summarized in my words here, Satan's temptation was an attempt to motivate Adam and Eve to want something they did not need. Satan was crafty and knew how to deceive Adam and Eve in their naïve state. He distorted God's truth and pitched the lie he acted upon personally. He convinced them the fruit was pleasing to the eye and that they could gain knowledge. Man got what he asked for but ended up with far more than he bargained. Since man was naïve, he did not know evil experientially. Because of the fall, he had a new sense of guilt and shame. He acquired the desire to hide from God and felt immediate judgment, which soon was specified in divine curses on Adam, Eve, and Satan. Finally, they were expelled from the garden to prevent them from eating from the Tree of Life and permanently left in this fallen state.

ground because of you; in toil you will eat of it all the days of your life ... by the sweat of your face you will eat bread, till you return to the ground, because from it you were taken; for you are dust, and to dust you shall return” (Gen. 3:17-19). Smith points out that Adam’s sentence was severe. He chose the love of creation rather than God, but now creation turned against him. Having eaten the forbidden fruit, the earth now refused him food. Having disobeyed God, the earth, which he had been given dominion over, now did not yield to his will. Five specific aspects of man’s punishment are laid out.¹²⁰

- Ground is cursed (3:17).
- Toil for food in misery (3:17).
- Uneatable earth products multiply thus making it difficult to cultivate (3:18).
- Continuous labor required throughout life making it arduous (3:19).
- Destined to return to the ground from which created (3:19).¹²¹

Impact of Knowing Good and Evil

There is an impact of knowing good and evil. One possible theory is that man was not created to know the knowledge of good and evil. If this were the case, then this would be the heart of the problem one suffers with now and knowing evil causes problems since individuals were not created to possess that knowledge. Paul addresses this problem when he talks about sin not being part of man’s original nature, resulting in internal war: “I find ... evil is present in me, the one who wants to do good. For I joyfully concur with the law of God in the inner man, but I see a different law in the members of my body, waging war against the law of my mind and making me a prisoner of the law of sin which is in my members” (Rom 7:21-23).

One sees the one post-Edenic judgment of God in the flood. God decided it was better to

¹²⁰ J. E. Smith, *The Pentateuch. 2nd ed. Old Testament Survey Series. Genesis 3-21.*

¹²¹ *Ibid.*

destroy man when He said, “I will blot out man whom I have created from the face of the land, from man to animals to creeping things and to birds of the sky; for I am sorry that I have made them” (Gen. 6:7-8). While this may appear harsh to modern moral sensibilities, amidst this judgment Noah found favor in the eyes of the Lord and God saved a faithful remnant, but unfortunately, sin survived the flood and man’s fallen nature stayed with him. Since in this dissertation redemption is considered, a larger perspective on God’s view of the judgment of sin should be summarized. From Romans 6:23 one sees that the wages of sin is death. Yet it also points out that the free redemptive gift of God is eternal life in Christ. Individuals are meant to be in Christ, connected to Him as a part of the body. By accepting Christ’s sacrifice, one does not have to pay the price for his or her sins. As will be shown, redemption in Christ has a biological component that occurs when salvation and spiritual formation take place. This is shown in epigenetic adaptation.

Confronted with Evil in the World

After the fall, man could do evil things. Death is a natural outcome of the evil that is man’s separation from God. Enmity exists in all of life and is seen in (1) man’s rebellion against God, (2) man’s struggle within himself (*psychomachia*), (3) man’s fight with nature, and (4) man’s war against man (Gen. 3:14-19, Eph. 2:13-16). Groothuis expands on this: “The presence of evil in the face of a good God has classically been called the problem of evil. Simply put, if God exists, there should not be such evil, since God would have the power and desire to stop it. Therefore, the existence of goodness and power of God is brought into question.”¹²² There was a biological reaction to pain, suffering, envy, greed, etc. as man experienced things he never knew

¹²² Douglas Groothuis, *Christian Apologetics: A Comprehensive Case for Biblical Faith* (Downers Grove, IL: InterVarsity Press, 2011), 614-615

before and will never go away. Individuals developed coping mechanisms. There is aggregation of evil building upon evil-making, worsening the human conditions. Also, tools and technology can enhance the impact of evil and in some cases mitigate against evil in specific situations for individuals or groups when acting in accord to their *Imago Dei* calling and mission.

How can an omnipotent, omnibenevolent God and evil coexist? This is called the logical problem of evil. Feinberg contends that from Plantinga's free will defense there is acknowledgment among both atheists and theists that the logical problem of evil is solvable. Feinberg thinks other defenses also answer this logical problem, but Plantinga's free will defense is the best known.¹²³ Moreland and Craig also agree that Plantinga solves the logical evil problem, since if it were even possible that man has permissive freedom then the inability of God and evil to coexist is not necessarily valid, and the atheist is left with the burden of proof to show the impossibility of the coexistence God and evil.¹²⁴ Thus Hume's logical problem of evil argument fails.¹²⁵ The historical attempts create logical problems fall short. As Clay Jones points out, sin matters. God offers redemption, but it came at the price of the sacrifice of Christ.¹²⁶

The Evil Man is Now Capable of Doing

Sin and evil in man's heart unfortunately bear fruit—rotten fruit. The early biblical account shows how things got worse by sin as man moved away from God and acted against God's plans in more destructive ways, developing evil further from generation to generation.

¹²³ John Feinberg, *The Many Faces of Evil: Theological Systems and the Problems of Evil: Revised and Expanded Edition* (Lima, OH: Good News Publishers, 2004), 24-27.

¹²⁴ JP Moreland, William Lane Craig, *Philosophical Foundations for a Christian Worldview* (Downer Grove, IL: Intervarsity Press 2009), 539.

¹²⁵ Clay Jones, *Why Does God Allow Evil?: Compelling Answers for Life's Toughest Questions* (Eugene, OR: Harvest House Publishers, 2017), 20.

¹²⁶ *Ibid.*, 207-208.

First, one sees Cain who, when faced with the temptation to envy, did not overcome it and committed the first murder (Gen. 4:6). Second, Lamech shows how this sin is transmitted generationally and how sin progresses in intensity and effect. Lamech boasted he was worse than Cain: “Lamech said ... ‘I have killed a man for wounding me; and a boy for striking me. If Cain is avenged sevenfold, then Lamech seventy-sevenfold’” (Gen. 4:23-24). Sin propagates horizontally through communities, and historically through generations. A biological example that shows this propagation will be explored with alcohol metabolism. The impact through communities will be addressed when discussing the impact of innovation champions. The generational impact will be considered when looking at biblical and early church leaders.

It is an unfortunate, yet indubitable, fact that ordinary men have the capacity to embrace evil and even become killers. One concrete example of this is retold by Christopher Browning in his book *Ordinary Men* about the Nazi execution force from Reserve Police Battalion 101.¹²⁷ This Battalion, composed of “ordinary” Germans, thinking they were fulfilling their obligations to the government and nation of Germany, came to embrace, even enjoy, their role as a Jewish death squad, thus perpetrating terrible mass Jewish killings in their duties.¹²⁸ Objectively, evil actions are always available and can be exercised as a choice. As is often laid out in biblical examples of case law and situations when actions are wrong (Ex. 21-23), actions that are evil and sinful before God should be condemned and not performed.

Assessing Changes in Man’s Character by the Fall

It is clear that the fall of man had massive ontological, epistemological, and axiological

¹²⁷ Christopher Browning, *Ordinary Men: Reserve Police Battalion 101 and the Final Solution in Poland* (New York, NY: Harper Collins, 2013).

¹²⁸ Ibid.

effects (man's nature, will, and make-up)—all of them negative, it would seem. An immediate change occurred in man after he sinned. He had to deal with emotions he never knew before, like fear. There is a clear loss of innocence in the fall. From a conservative evangelical point of view, fallen man is born depraved with a seared conscience. Ordinary men can do extraordinary evil. Man sins and cannot avoid it, since he is a slave to sin in a fallen state. Augustine in his book *The Enchiridion* presents four states of man regarding sin: (1) in the Garden of Eden: able to sin, able not to sin (*posse peccare, posse non peccare*); (2) after the fall: not able not to sin (*non posse non peccare*); (3) after conversion: able not to sin (*posse non peccare*); and (4) in heaven: unable to sin (*non posse peccare*).¹²⁹ The first three states are considered below, where I reflect on the differences between the three, particularly in terms of human relationships and aspects of our biology.

Man may have knowledge of perfection (e.g. thoughts of the pre-fallen world) and what life could be like without evil and the effects of sin. As a result of the fall, however, man went from an eternal state, never experiencing death (immortal), to a state full of death (mortal). Man was changed and lost the freely available direct divine fellowship he originally had.

In addition to these ontological changes within the human person, there were epistemic shifts. Adam and Eve had fading memories of open connection with God, but those born after the fall had no personal knowledge of this connection. As is developed in PART 2: Spiritual Social Networking, since the early generations of man lived for a long time, Adam and Eve could have told multiple generations of their first-hand experiences with God. Unfortunately, over time, this first-hand knowledge of connecting with God would fade away from man's personal experience, awareness, knowledge, and for at least some, interest. Smith notes after the fall man knew good

¹²⁹ Augustine, *The Enchiridion* (Seattle, WA: CreateSpace Independent Publishing, 2012), 170-171.

and evil, but not the same way God does (see Gen. 3:22). A sick man knows suffering, but this is different from the discernment of the doctor who treats him. Since God is omniscient, He knows all about evil, but man knows evil through his personal experience.¹³⁰ Because of our rebellion and sin in the Garden of Eden, our *sensus divinitatis* was impaired. Plantinga discusses how man struggles with lost knowledge of God and the difficulty one faces with our *sensus divinitatis* being damaged and corrupted by sin. It is partly restored to proper operation by salvation and the work of the Holy Spirit. Plantinga argues that a properly functioning *sensus divinitatis* can produce theistic belief, which can have sufficient warrant for knowledge.¹³¹ Based on the information from the Genesis account and the information from scholars mentioned above, a summary of various possible changes that took place in man are listed in Table 1.

¹³⁰ J.E. Smith, *The Pentateuch. 2nd ed. Old Testament Survey Series. Genesis 3-21.*

¹³¹ Alvin Plantinga. *Warranted Christian Belief*, 185-186.

Table 1. Human Characteristics Before the Fall, After the Fall, and After Salvation¹³²

Characteristic	Before the Fall <i>posse peccare, posse non peccare</i>	After the Fall <i>non posse non peccare</i>	After Salvation <i>posse non peccare</i>
Will	Holy	Damaged	Damaged but has God's grace
Citizenship	God	Satan	God
State of living	Alive in God	Threatened by physical, spiritual, and eternal death	Spiritually alive in God
State of physical body	Immortal – no disease, seeds of death, no unnatural cravings	Mortal – vulnerable to disease, contains death, unnatural cravings	Mortal
Aging and DNA	No age or degradation	Age and degradation. Negative DNA expression changes.	Age and degradation. Positive & negative DNA expression changes
Relationship to disease	Lake of disease and death	Full of disease and death	Full of disease
Physical view of self	Unaware of nakedness	Ashamed of nakedness	Ashamed but know grace
Relationship to God	Free fellowship	Fear of God	Fear of God
Moral condition	Innocence	Guilty and full of shame	Grace from God
Connection with sin	No connection and unaware of sin's impact	Controlled and full of sin	Sinful but not controlled by sin
Relationship to lust	Outside self-potential influence on desire	Inward lust and sinful desire	Inward lust and sinful desire at war in believer
Covering	No covering needed	Covered their loins	Covered
Blessed or cursed	Blessed	Cursed	Blessed in a cursed world
Ground – effects of natural evil	Ground blessed man's efforts	Ground cursed man's efforts	Still deal with cursed environment
Knowledge of evil	Awareness of evil	Experience with evil	Experience of evil
Fellowship	Fellowship with God	Broken fellowship	Some fellowship with God
Tree of life	Access to tree of life	No access to tree of life	No access but have new spiritual life

Looking for relational and biological changes between Augustine's first three states of man.

Possible Biological and Physical Changes from the Fall

What biological and physical changes occurred after the fall? No first-hand biological evidence exists from Adam and Eve, yet to a certain degree, one may be able to derive information and inferences from sources like the biblical record. Beyond this, one could examine many other things like (1) sociological character studies of man, (2) religiosity studies comparing

¹³² J.E. Smith, *The Pentateuch. 2nd ed. Old Testament Survey Series. Genesis 3-21.*

those holding to a Christian spirituality versus those who do not (using evaluation metrics like what Kendell suggests¹³³), (3) psychological surveys comparing individuals' responses to the human condition, (4) studies looking at response and coping mechanisms to pain and evil in the world (including addiction studies), and (5) scientific studies on specific physical characteristics of human make-up. Most of this falls outside the scope of this paper, but there is significant work done within these areas to warrant mention. Sociological insights are included in PART 2: Spiritual Social Networking. In this section, a few comments on aging are addressed, and in PART 3: Redemptive Evidence a more detailed look at alcohol metabolism and epigenetic adaptations is considered.

Human historical demographics (including biblical evidence) show that the human lifespan has changed and is influenced by various biological, spiritual, and environmental factors. From the biblical account, human life has gone from infinite (immortal) before the fall to the order of a millennium (mortal) in the early biblical record, and slowly decreasing to 120 years around the time of the flood (Gen. 6:3), assuming that this is not composed of honorific ages, which will be discussed later.¹³⁴ Other factors like disease, medicine, and lifestyle impact lifespan, but nothing has been proven to extend it much beyond 120 years. As discussed by Sanford, accumulating abnormalities are manifested via expressed genetic mutations, some of which are passed on in reproduction. The known high human mutations rates have negative

¹³³ K.S. Kendler, et al. "Religion, Psychopathology, and Substance Use and Abuse: A Multimeasure, Genetic-Epidemiologic Study," *Am J Psychiatry* 154, no. 3 (March 1997).

¹³⁴ Steven Collins and Latayne Scott, *Discovering the City of Sodom* (New York: Howard Books, 2013), 137, 143, 146, 240, 254.

impacts and neither lead to positive results nor amplify organism function.¹³⁵

Human DNA expression may have changed through mechanisms like epigenetic adaptation after the fall. It is possible that an aging mechanism was activated with the curse. Two theories about aging and genetics are: (1) aging of the genome causes errors in cellular reproduction, and (2) genes may exist in the human genome that cause aging. Genetic faults can be viewed as an accumulation of genetic errors that cannot be prevented in the reproduction mechanism. Since the genetic error is included in the offspring's DNA, it is continually passed on. Epigenetic changes can alter the physical structure of DNA, and this can cause external DNA modification to turn genes on or off. It does not change the DNA, but rather alters gene expression as cells read and deliver instructions for manufacturing via messenger RNA.¹³⁶ Epigenetic disruption of gene expression can cause the same type of effect as a genetic predisposition to developing an abnormality.¹³⁷ Thus, immortal gene expression corresponding to pre-fall cellular activity could have been prevented post-fall. In terms of aging of an individual's genome, Vijg argues that DNA damage could contribute to aging-related cellular degeneration and death.¹³⁸ Vijg also thinks cytogenetic studies have established that the occurrence of chromosomal aberrations increases with age in white blood cells in both humans and mice. As one ages, physically various biological functions slow down, have reduced function, or fail, and

¹³⁵ John Sanford, *Genetic Entropy* (Ithaca, NY: FMS Publications, 2015), 182-183, plus, the fourth edition is expanded with an extra chapter dealing with this area, considering the latest research publications, and the results from the ENCODE Project.

¹³⁶ Rachael Rettner, "Epigenetics: Definitions and Examples," accessed June 6, 2017, www.livescience.com/37703-epigenetics.html.

¹³⁷ Robert Cheng and Wan-ye Tang, "Environment, Epigenetics, and Diseases," ed. Sahu Saura, *Toxicology and Epigenetics* (Hoboken, NJ: Wiley 2012), 37.

¹³⁸ Jan Vijg, *Aging of the Genome: The Dual Role of DNA in Life and Death* (New York, NY: Oxford University Press, 2007), 198.

genetic DNA errors accumulate.¹³⁹ Pedro de Magalhães and his colleagues show assessments of human aging research is a debated process. Many age-related changes have been characterized, but there are multiple and conflicting theories for the underlying mechanisms that cause these changes. It is unknown why distinct species age at different rates, and there is no known mechanism to interfere, delay, or postpone human aging.¹⁴⁰

Looking at Man – Before the Fall, After the Fall, and After Salvation

Man, according to the biblical *Imago Dei*, is created in God's image and is His image bearer. He is the crowning achievement of His creation (Psalm 8). Yet, with the introduction of sin, separation from God becomes reality. As a result of man choosing his own fate, he has to live with the consequences.

One way to understand the impact of the fall is to attempt to create a model of what man is like before the fall, after the fall, and even after salvation and sanctification. How can this be modeled to assess the impact of the fall? Plantinga has attempted a model to support his argument for warranted Christian belief; perhaps some type of model could go further and look at aspects of man's nature that were changed by the fall and salvation. The fall clearly changed human beings. Man's conversion shows redemption of some aspects of human nature, and this may help one explore aspects of man before the fall. Because of the fall, the following changes took place:

- Spiritual – free access to God changed to alienation from God
- Mental – truth is not certain
- Physical – the body ages, contracts diseases, and dies (even if the spirit remains disembodied until resurrection)
 - Possible DNA or gene expression change, aging, plus no tree of life rejuvenation

¹³⁹ Ibid., 203.

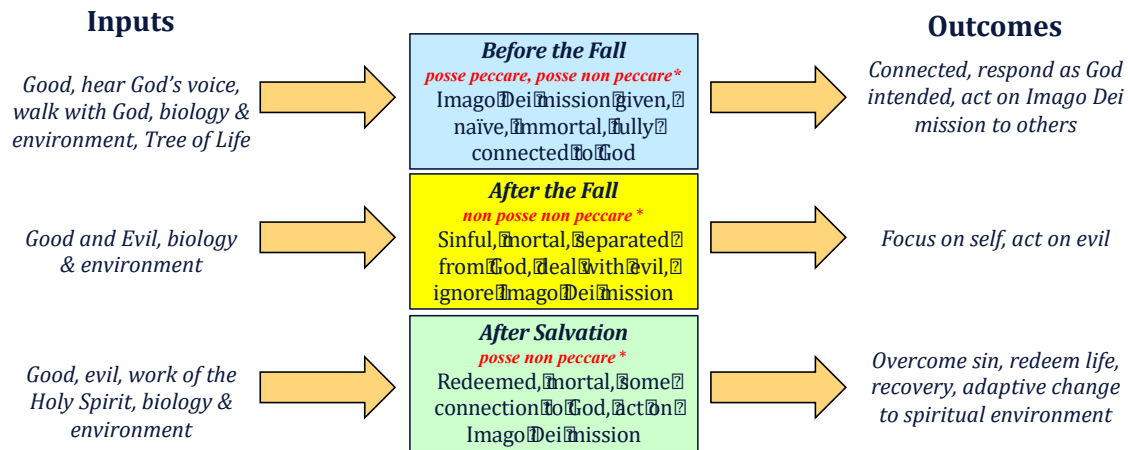
¹⁴⁰ João Pedro de Magalhães, et al., "The Human Ageing Genomic Resources: online databases and tools for biogerontologists," *Aging Cell* 8 (2009): 65–72.

- Emotional – negative emotions like fear and shame are known in a personal way

Man is a thinking, emotive, physical, and spiritual being with a body and soul. Emotional experience is altered through sinful rebellion, both from the fall and man’s sinful nature.

These models that reflect Augustine’s first three states of man (*posse peccare*, *posse non peccare*, and *non posse non peccare*), create high-level, abstract representations of reality to look at behaviors and relationships by establishing analogies with only the necessary components to accurately match specific behavior being considered. A top-level frame of reference or model could be viewed as a transfer function where inputs flow into a function $F(x)$ that translates the behavior into the corresponding outputs. A model outline for three states of man is shown in Figure 5 along with a possible example of input stimuli and outcome responses for each state in Table 2. Developing more detailed modeling is not attempted in this section.

Figure 5. High Level Models of Man Before the Fall, After the Fall, and After Salvation



* Three of Augustine’s four states of man regarding sin

Table 2. Input Stimuli and Responses for Three Models of Man

Stimulus	Man, Before the Fall <i>posse peccare, posse non peccare</i>	Man, After the Fall <i>non posse non peccare</i>	Man, After Salvation <i>posse non peccare</i>
Temptation	Not impacted	Slave to sin	Sins but not slave to sin
Knowledge	Knows good only	Lacks supernatural insight	God reveals greater truth and knowledge
Evil	Naïve	Capable of doing evil	Can transcend thru power of Holy Spirit
Relationship	True and complete intimacy	Broken intimacy	Some restoration in intimacy
Time	No age or degradation	Age and degradation	Age & degradation, but spiritual regrowth
Biology & Environment	Access to tree of life	Epigenetic adaptation to fallen environment	Epigenetic adaptation to restored relationship with God

Epigenetics and What May Have Taken Place After the Fall

Epigenetics represents a current area of research in molecular biology that is uncovering how some gene function can adapt to environmental conditions (and retain memory of these changes). Some of these changes are inheritable, e.g. when germ line cells are impacted. Spiritual formation activities and supportive spiritual networking can promote beneficial adaptations. One can grow spiritually, emotionally, and even biologically and have the results recorded all the way down to a genomic level by epigenetic adaptation. How one operates physically can be altered. Destructive behaviors, abuse, and unsupportive networking can cause generational problems (like alcohol abuse, as seen in conditions like fetal alcohol spectrum disorder (FASD)) that can worsen without some kind of redemption. The example of alcohol metabolism and alcohol recovery will be explored later. Unfortunately, through epigenetics, adaptation that can take place biologically, the effects of sin, and even the memory of past sin, can be coded and reinforced in biological gene expression of an individual and also passed on. This forms a possible place for God’s redemptive hand to work as well. There is plenty in human

lives that needs redeeming.

Concerning models, the further study of epigenetics could be an area that would allow for an abstract model as suggested above to become more concrete. This process is started by the synthesis of the molecular biology results that are analyzed for alcohol metabolism. One can consider the impact of how memory in human cells aligns with the evidence seen before the fall, after the fall, and after redemption. What may be called “cell memory” in general, except what may be possible by epigenetic adaptation, goes beyond what will be addressed in this section, but it is suggested here for an opportunity for further exploration.

Addiction as a Coping Mechanism

Life prior to and after the fall is starkly different. Our fallen vantage point results in the loss of some access to God, and therefore, having to cope more independently with a range of negative emotions, the multi-faceted impacts of sin, and the collateral damage that occurs living in a world full of evil. Examples of the impact of sin and evil include (1) the increasing ease of enabling societies to kill classes of individuals like babies, elderly, and the sick, (2) promoting easy access to suicide, (3) legalizing more types of recreational drugs, (4) coping with feelings of hate, despair, and anxiety, and (5) dealing with the impacts of war and post-traumatic stress disorder (PTSD). There is a range of coping mechanisms one can chose to handle such evils. Some are good, like turning towards God and developing spiritual formation, while some are bad, like substance abuse. Some individuals suffer from depression, past hurtful issues, or a desire to escape from the unwanted pressures of reality. Turning to what might appear to be helpful substances and behavior is a well-known alternative. Unfortunately, this reliance on substances leads to destructive and addictive behavior, in turn leading to the abuse of substances and unintended consequences. Instead of moving one closer to a state of good health, addiction

moves one in the opposite direction. A case where this can happen is with alcohol, which will be examined in this dissertation.

Addiction and Brain Imaging – Evidence Showing Alcohol Addictive Coping

Galanter points out how functional magnetic resonance imaging (fMRI) has let us see which parts of the brain are active during specific psychological tasks. As an example of what has been found from this tool, fMRI studies have differentiated two types of empathy: emotional contagion and cognitive perspective taking, showing they are centered in different parts of the brain, in cortical sites. fMRI studies have shown many brain areas that can be activated by alcohol cues.¹⁴¹ Additionally, craving is triggered with enhanced dopamine signaling in individuals with deficits in dopamine activity.¹⁴² Schacht notes that alcohol cues, which induce cravings, are believed to contribute to relapse, and these cues activate a number of brain areas, such as VS, ACC, and vmFPC.¹⁴³ Kalivas suggests that addiction is in part an inability to regulate habitual drug seeking and drug taking behavior. So even with negative social and personal consequences, the addict continues.¹⁴⁴

Redemption in Christ – The Target for Our Spiritual Formation

One needs spiritual direction in order to move away from destructive ways of coping with problems. My claim is the clearest identification of a twelve step “higher power” in recovery is

¹⁴¹ Rohan Palmer, John McGeary, “Models of drug addiction: Theories and future applications in prevention and treatment,” *Brown University Child and Adolescent Behavior Letter*, May 2016.

¹⁴² Marc Galanter, “An initial fMRI study on neural correlates of prayer in members of Alcoholics Anonymous,” *American Journal of Drug and Alcohol Abuse* 43, no. 1 (2017): 44-54.

¹⁴³ Joseph Schacht, et al., “Functional neuroimaging studies of alcohol cue reactivity: a quantitative meta-analysis and systematic review,” *Addiction Biology* 18 (2012): 121-133.

¹⁴⁴ Peter Kalivas, “Addiction as a Pathology in Prefrontal Cortical: Regulation of Corticostriatal Habit Circuitry,” *Neurotoxicity Research* 14, nos. 2-3 (2008): 185-189.

to look towards Christ. God opened an opportunity to restore man to life. Sin came through man's rebellion by eating from the Tree of Knowledge of Good and Evil, and the impact of sin was overwhelming. Further, man forget to hate sin like God does.¹⁴⁵ ¹⁴⁶ Through salvation in Jesus Christ, God can change parts of man's nature, as one can see in passages like John 10:10, which talks about Jesus coming so that all who believe in Him may have life and live abundantly.

My claim is that individuals all have an internal awareness of the reality of God. There is a God, and God calls out for mankind to connect with Him in many areas of life. Individuals have a sense of the divine, which is called *sensus divinitatis*. As Plantinga suggests, man's *sensus divinitatis* is partially restored through salvation: "*sensus divinitatis* is partly healed and restored to proper function by faith and the concomitant work of the Holy Spirit in one's heart."¹⁴⁷ There is a spiritual rebirth where man is born again or brought back to life. Jesus states in John 3:2, "Truly, truly, I say to you, unless one is born again he cannot see the kingdom of God." He goes on to state in John 3:5, "Truly, truly, I say to you, unless one is born of water and the Spirit he cannot enter into the kingdom of God. That which is born of the flesh is flesh, and that which is born of the Spirit is spirit. Do not be amazed that I said to you, 'You must be born again.'" Spiritual rebirth cleanses man from sin and brings transformation and renewal.¹⁴⁸ Through the process of spiritual formation and engaging in spiritual social networking, individuals develop spiritually, the *sensus divinitas* becomes clearer, and people know Christ at a deeper level. This

¹⁴⁵ Clay Jones, *Why Does God Allow Evil?* (Eugene, OR: Harvest House Publishers, 2017), 45

¹⁴⁶ Clay Jones, "We Don't Hate Sin So We Don't Understand What Happened to the Canaanites." *Philosophia Christi* 11, no. 1 (2009).

¹⁴⁷ Alvin Plantinga, *Warranted Christian Belief* (New York: Oxford University Press, 2000), 184.

¹⁴⁸ John 3:5 Commentary, Crossway Bibles, *ESV Study Bible* (Wheaton, IL: Crossway Books, 2001).

forms the motivation to keep going.

Conclusions from Sin and the Fall

This section explored the impacts that came with the fall and the evil that plagues humanity. The worst thing that has ever happened to man is the fall—so much so that man’s character changed so that man now must deal with evil around him and evil in his heart. Individuals are never completely broken in a place where God cannot seek and save them. Man’s inheritable nature changed with the fall. Through Adam’s sin, man’s citizenship went from God to Satan. Through salvation, man’s citizen reverts to God, and some aspects of man’s character is restored—and perhaps even physical parts of genomic expression that existed before the fall.

Moreover, the presence of such evil does not provide a defeater for Christian theism. Alvin Plantinga and others have shown that God and evil can logically coexist. Therefore, the logical problem of evil is not an issue. Dealing with the problem of evil was not a major focus of this section, but God’s reaction to the fall and His offering of salvation shows that He is interested in helping man overcome a fallen, evil world.

Finally, this section suggested a possible approach for a model of man’s state before the fall, after the fall, and after salvation. Such a model could provide further insight into human biological nature and what changes going from state to state. One sees what God chose to redeem in salvation and what was left fallen. In addition to this basic model, the memory that is utilized in epigenetics is introduced. This is one way the effects of sin and redemption can be stored in human bodies and passed on to future generations.

It is possible that human DNA changed because of the fall or that other factors caused certain gene expression to stop and things like aging to come about. The onset of aging is also impacted by not having the fruit from the Tree of Life; to live forever in one’s fallen state is not

what God wanted. Since epigenetic changes can alter gene expression in DNA, epigenetic change may be a mechanism (or part of a mechanism) that caused man's loss of immortality.

UNIT 3: Summary of Creation, *Imago Dei*, and the Anthropology of Man

Characteristics of Creation and *Imago Dei*

Looking at the anthropological implications of the *Imago Dei*, the impact of sin, the extra material in the Appendix, and building upon what has been discussed so far, God is intentional in His plan for creation and the specific role of man. In the order of creation, there are: (1) creation of the heaven and the earth, (2) separation of land and sea, (3) creation of light, seasons, illuminations to guide day and night, (4) sea living creatures, (5) land living creatures, and (6) creation of man in God's image. Even with the creation of man, God noted that it was not good for man to be alone, so He created woman. In the Garden of Eden, man and woman were exactly in the state God wanted. Unfortunately, man disobeyed God and ate from the Tree of Knowledge of Good and Evil, choosing to listen to the advice of Satan rather than trusting in God. As a result of sin, man felt shame, fear, naked, and uncomfortable around God. This was not the state in which God wanted man. Fellowship had been broken. There was no turning back to the way things were. Since God did not want Adam and Eve to eat from the Tree of Life and forever be locked in this state, He cast man out of the Garden of Eden and prevented him from returning. God clothed them with animal skins, which ended up being the first of many sacrifices of animals.

Man would have to toil for the rest of his life and ultimately die. However, the good news is that man would not forever live in this fallen state. The road ahead would be hard, but it would end. God began talking about sending a redeemer, and within a few generations man began calling on the name of the Lord.

Even with sin, man is an image bearer of God. Christians are called to bring the image and message of Christ to others. This image includes people's bodies. Any discussion of spirituality should include the dimension of the body and how the body helps one fulfill the various roles as an image bearer.

Centrality of Relationship in an Ecosystem

A key driver for God is relationship. God has always experienced relationship in the Trinity. Man, being created in the image of God, is also designed to be in community. The primary relationship God wants restored and nurtured is man's relationship with Him. Everything God created is about ecosystems of individual parts being part of a whole. One sees this being reflected in plants, animals, and the cycles of the seasons. In all of these views one sees images of the nature of God. Within the various levels of macro creation, there are layers of order and design. Things work together, and one can see glimpses of the perfect order God intended man to know for all time. The further one looks into the heavens and the deeper one peers into molecular biology, the more of these same messages will be seen. One simply discovers more layers of life, order, design, and harmony. Solar systems fit into galaxies, and galaxies fit into the universe. Man does not fully understand extent of the universe, and perhaps never will. When one looks deep into molecular biology, he or she finds incredibly complicated and finely tuned processes that are robust, interdependent, and resilient. Life is more complicated than just the physical world. It is like jumping from a two-dimensional to a three-dimensional world.

Creation and Man's *Imago Dei* Calling

Divine revelation gives us insight into the purpose of creation, which is outlined in the Appendix section on Insights from Scripture. The biblical information man has on creation and

the *Imago Dei* comes mostly from contextual passages focusing on the life and situations of individuals and nations with whom God is actively engaging. One can infer general truth from these passages about creation and how one should view it. People's bodies are temples of the Holy Spirit (1 Cor. 6:19), so there is a special presence of God in people's bodies at a level that goes beyond the biochemistry. God engages all of His resources to bring man back to Himself. The heavens themselves declare the glory of God and form a witness (Rom. 1:18-20). God has redeemed mankind. By the works of Christ and His precious blood on the cross, one can restore his or her relationship with God.

As part of man's calling as an image bearer of God, he should acknowledge that some aspects of his biology may be observables that reflect his status as an image bearer. Remember the three offices that Frame summarized above that one possess with the *Imago Dei*. Some of these offices are straightforward, like man's role of presence (priestly role) of being able to reproduce and fill the earth. Other roles have to be unpacked more like man's role to control and subdue (kingly role), where individuals are empowered to take dominion over the earth. This gets into the specific make-up of individuals. Not all are called to major leadership roles, but one still has a governance role in areas such as family. In man's role of authority (prophetic role), one has a mandate to impact culture and communities. This prophetic authoritative role that one has on human communities gets into a key area that will be developed next by looking at spiritual social networking and innovation champions—individuals who take seriously the calling to bear the image of Christ and actively engage in their *Imago Dei* mission and calling.

Plan for Redemption

God's redemptive plan to recover man from his fallen and lost state was fulfilled by Christ's sacrifice. There is no indication that man was genetically changed. If he was the same,

but would now experience death, there would have to be a mechanism for death. Within current biological understanding, epigenetics is a reasonable mechanism by which the aging process could have started. Through geological changes, most notably the flood, the earth changed, the environmental conditions for human life became harsher, and the expected lifespan was reduced to 120 years. This came to pass gradually as the genealogical records show lifespan reductions, with the last of the near-millennials being Noah. Life on earth as it now stands supports an environment of limited life. Physical death is normal, and dying in our fallen state is better than facing immortality in that state, as, reflecting back to the garden, one can see that God did not want man to stay alive in this fallen state.

UNIT 4: Conclusions from *Imago Dei* and Implications for Biology

Imago Dei and Our Divine Calling and Mission

From the exploration of the *Imago Dei*, one sees that man's Divine calling and mission takes place in the context of living and operating in bodies. Scripture makes it clear that there is redemption for our sins in Christ. The scope of that redemption is not just spiritual in nature, but it is also supported by missional redemptive initiatives animated in human bodies. When one takes action in the *Imago Dei* roles of king, prophet, and priest and ask to be filled with the Holy Spirit, individuals are operating spiritually the way God intends. Empowered as God's emissaries, God's children bring to the ends of the earth God's message and presence. Individuals are redeemed from the penalty of sin and given daily what they need to bout in the good contest of laboring to do their part in God's calling.

Earlier in this dissertation, I discussed studies that show the impact of prayer and engaging in faith. Prayer involves asking, making commitment, aligning oneself with the will of God, and abiding with the outcomes. Selvam points out that prayer provides a protective effect

on addictive behavior. Byrd suggests that prayer and intercessory prayer have a beneficial impact on medical conditions and recovery. Lambert states that high spirituality and religiousness correlates with lower alcohol use. Harrell points out that religious coping is associated with less alcohol use. All of these examples show a redemptive biological component. Galanter found that Alcoholic Anonymous prayers are associated with self-reported reduction in alcohol craving. This suggests a neural process underlying the effectiveness of these prayers, an undeniable biological component that he examined with his fMRI brain scans. Spiritual awakenings result in reduced alcohol use after twelve step recovery treatment as found in Alcoholic Anonymous.

Thus, research evidence shows the impact of prayer and religion on our biology. These factors are instrumental in impacting our medical conditions and recovery. Since individuals are created for good works in Christ (Eph. 2:10), acting on their *Imago Dei* mission helps them in redemption and recovery from the effects of sin. Since individuals are created for action, acting for Christ and helping others takes their focus off themselves and onto the mission they were made for. One gives what one knows away to others.

Biology with a Mission

With the *Imago Dei* mission, human biology has a supportive role in ensuring that individuals are able to do their calling. In this light, even man's biology has a mission. Of course, there are other aspects of reality that human beings also know are true. One lives in a fallen world and suffers the effects of sin and the fact that the penalty of sins led to death. Yet in the midst of human beings' lives, they are still called to fulfill their mission. Thus, in the time one has on earth, his or her biology will respond the way it was designed: to be supportive and responsive to man's higher calling. In this regard, the complexity of biology's function is high enough that it will be narrowed down to a particular area where scientific data can help answer

the research question for this dissertation. From a triangulation point of view, it follows that man's biology, created in the Garden of Eden, is designed to draw him closer to God and to another and will adapt to positive environmental, spiritual, and relational threads that one acts on even in a fallen state. Human biology had to adapt to life in a fallen world, but the fundamental design imperatives are still in place. Human biology helps to lock man more into positive and connected relationships with God and those in man's communities. Unfortunately, it can also lock man into negative behaviors and mindsets, which can be seen in addictive behavior, which moves man out of relationship and away from acting on his *Imago Dei* mission.

Biological Redemption Taxonomy with Biblical Instances

When one looks at Scripture and the findings from the three researched areas of *Imago Dei*, spiritual social networking, and molecular biology, one sees various kinds of biological redemption. In order to make distinctions between them and align evidence with biological processes, three taxonomical categories were discussed, (1) direct biological redemption, (2) indirect biological redemption, and (3) special or supernatural biological redemption. Direct biological redemption captures "biology correcting biology," as evidenced by the pre-designed epigenetic mechanism of grace. This mechanism is the same for the believer and unbeliever. This common redemptive covering is seen when Jesus shares that the sun rises and the rain falls on the just and unjust alike (Matt. 5:45). Indirect biological redemption captures behavioral adjustment due to spiritual obedience that results in health benefits. This redemption could have a biological component, just like direct biological redemption, but would only be accessed by those who are informed by the fruit of the Spirit as a result of spiritual formation and supportive community involvement. Indirect biological redemption can be seen in Scriptural examples like the life-changing encounter of Mary Magdalene after anointing Jesus with oil (Mark 14:3-9). It is

also exemplified in the life-redemptive experience of the Paul and the disciples even in the midst of their suffering. Even though their outer man was wasting away, the inner man was being renewed (*amakainoo* - to make new) day by day (2 Cor. 4:16). Special or supernatural biological redemption can be seen in Scriptural examples like Jesus healing the paralytic (Jn. 5:1-15), raising Lazarus from the dead (Jn. 11:1-44), and the woman recovering from her chronic bleeding by touching Jesus' robe (Mark 5:25-34). Clear outside supernatural influences have to intervene in this form of biological redemption. In this case, the biology cannot act upon redemption in its broken state.

The research in this dissertation examines indirect biological redemption, looking for the evidence showing how individuals adapt and change as a result of having supportive spiritual environments and acting upon their *Imago Dei* mission. The concept of indirect biological redemption links the biological and spiritual factors that are reported in the studies and data discussed in this dissertation.

PART 2: Spiritual Social Networking

Introduction

This section discusses how Christians are meant to live and thrive in a networked community. The more one is actively involved in a community ecosystem, the more one will experience and benefit from (1) support, (2) motivation, (3) education, (4) nurturing, (5) healing, (6) group talent, and (7) group resources. This section examines spiritual social networks and spiritual formation and transformation in Scripture, as inspired by the Holy Spirit's hand. Part of this assessment looks at twenty-three Biblical and early church individuals who had a prominent role in God's redemptive history and the development of Christianity. Their efforts are recorded in the major thrusts of Scripture, and one can see how these influences were passed on to the

early church. Three evaluation tools will be used: (1) spiritual formation factors, (2) the idea of innovation champions, and (3) the impact of family, both biological and spiritual. These tools will be applied to Biblical and early church leaders, who championed in their life situations the cause that God put into motion in their time. The goal of this section is to gain insight into spiritual formation and transformation by surveying individuals used by God in the Bible and the early church. This section looks for common spiritual formation and spiritual network characteristics. How did they practice their spiritual disciplines? How were they shaped and transformed? How was this taught and shared? What observations are seen when comparing them side by side? What one knows now in spiritual formation leverages what was practiced in the Old Testament, New Testament, and the early church. In the Old Testament, God worked with specific individuals, teaching them about Himself, guiding their spiritual development, and encouraging them to share and connect others to this message. In the New Testament, the apostles and others experienced the risen Christ and were transformed. They learned spiritual formation disciplines from Jesus. In their disciple-making ministries, they continued these practices and passed them on to others in small groups and other communal settings. In the early church, Christ followers acted on the mission Jesus gave to the apostles. They studied what was given to the apostles and put it into practice. This included their spiritual formation. Just as in the lives of these individuals, God works in all believers, and one does his or her part to enhance his or her spiritual tuning to God by cultivating spiritual life, which results in spiritual formation, transformation, and growth.

Spiritual Formation Factors

Inspired by Panneberg's recommendation of utilizing historical science to understand the anthropology of man, three factors will be considered in this section as one explores the lives of

twenty-three Biblical and early church leaders who promoted innovative methods of acting upon their *Imago Dei* calling. These factors include (1) Dallas' Willard's spiritual formation elements, (2) Roger's concept of innovation champion, and (3) Walter Brueggemann's view of the spiritual importance of family and our community.

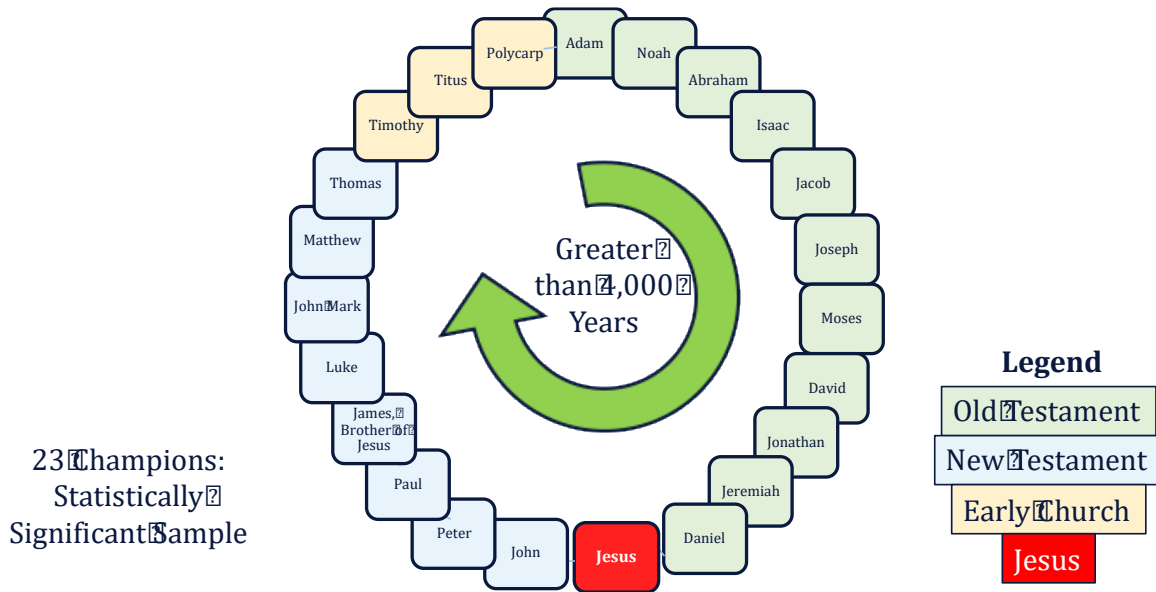
First, Dallas Willard's elements of spiritual formation are used to examine how each individual exemplified these characteristics. Dallas Willard states that spiritual formation is composed of (1) training in spiritual disciplines, (2) shaping the inner (spiritual) side of man, and (3) transforming man's spirit by the Holy Spirit, Scripture, community, and other spiritual agencies.¹⁴⁹ These spiritual formation disciplines help one more fully be able to execute his or her *Imago Dei* calling. The Bible consists of various genres, and each passage has its major purposes, such as giving the details of a historical narrative or focusing on Jesus' life as seen in the gospels (Greco-Roman biographies or *Bios*). As a result, looking for the specifics on spiritual formation details for certain individuals can take work. Some, like David, have ample coverage. Others, like Adam, are more limited. As a result, some evaluations will be more robust, and others will be more anecdotal. The first task is gathering this data and assembling key features. Next is summarizing the historical, social network, and spiritual formation factors. Finally, an assessment of these factors is done both individually and in a comparison fashion. In terms of assessment, the section develops (1) history sketches (*Geschichte*) by looking at a historical synopsis, story highlights, and temporal development to support an anthropological historical science assessment, (2) spiritual social network summaries, by listing mentors, disciples, and support from family and communities, and (3) spiritual formation highlights, by highlighting

¹⁴⁹ Dallas Willard, "Spiritual Formation in Christ: A Perspective on What It Is and How It Might Be Done," *Journal of Psychology and Theology* 28, no. 4 (Winter 2000): 254

spiritual training, how they shaped their spirit, and how they were transformed by the Holy Spirit.

To gain a representative number of individuals from Scripture and the early church fathers (similar to the approach used for the UK Biobank data discussed later in the molecular biology section), twenty-three biblical and early church innovation champions are used to develop a population of innovation champions that had God encounters and acted upon their *Imago Dei* mission. Scripture shows how God works with specific individuals, and the goal here is to discern repeated patterns that took place in their God encounters and actions in their *Imago Dei* mission. The selected individuals range over a 4,000-year time frame. From the Old Testament, individuals are taken from creation, the flood, the patriarchs, the unified kingdom, the end of the divided kingdom, and exile, specifically focusing on Adam, Noah, Abraham, Isaac, Jacob, Joseph, Moses, David, Jonathan, Jeremiah, and Daniel. This period of time spans several millennia, touching on very different cultures and circumstances. From the New Testament, Jesus, the disciples, and the disciples of the disciples are used, namely Jesus, John, Peter, Paul, James (the brother of Jesus), Luke, Mark, Mathew, and Thomas. This period of time spans several decades, with this segment of my study mainly focused on the first generation of Christ followers. From the early church, individuals who were the second and third spiritual generations from Jesus are used, namely Titus, Timothy, and Polycarp.

Figure 6. Biblical and Early Church Innovation Champions



Second, this section leverages Everett Roger’s concept of innovation champions. Roger traces how the ideas of innovation champions multiply in social and business-related circles, but one can consider the men of faith in this section as innovation champions. Roger examines a number of ways where an innovation champion embraced an idea that worked and then took the time and effort to share the idea and its benefits within his network trying. When this is done well, the influential and transformational ideas of an innovation champion expand, and there is a gradual adoption of the new innovation or idea. Along this line, the survey of each of the champions will trace how each of these individuals embraced the heart of God and the message they received along with how they passed it on to their community. At its heart, this is evangelism.¹⁵⁰

¹⁵⁰ Everett Rogers, *Diffusion of Innovation* (New York: Free Press, 5th Edition, 2003), 11.

Third, Walter Brueggemann argues for the importance of family in evangelism and the life of the church. This is one aspect of how individuals are called to be connected in community. One loves in relationship, and this is a natural way to bring people to a deep spiritual experience in Christ and start them on their journey of spiritual formation. One experiences Jesus through biological and spiritual family members who love (*agape*) and accept him or her unconditionally.¹⁵¹ With this view, to the degree possible based on what is available in the biblical text, the biological family and spiritual family component for each champion is examined and compared. Each individual's biological and spiritual family is examined for what motivates, inspires, and transforms it. Another related area that is discussed in UNIT 4: Thriving in Our Ecosystem, considers how one is connected in networks and how one lives, thrives, and exchanges ideas in ecosystems. This is true with friends, family, church, and communities. With this network in place, one has the opportunity to influence, inspire, and pass on innovation.

UNIT 1: Old Testament Spiritual Formation

Here, examples of the main themes (or thrusts) in the Old Testament are examined. Given more time and more words, this list could be expanded. God has worked through individuals. In the midst of what appears to be very different circumstances of each innovation champion, the same God intervened and brought each individual closer to Him and to a meaningful relationship. God was active in the affairs of each individual. Individuals of faith are considered in this survey.

Transformed Lives in the Old Testament

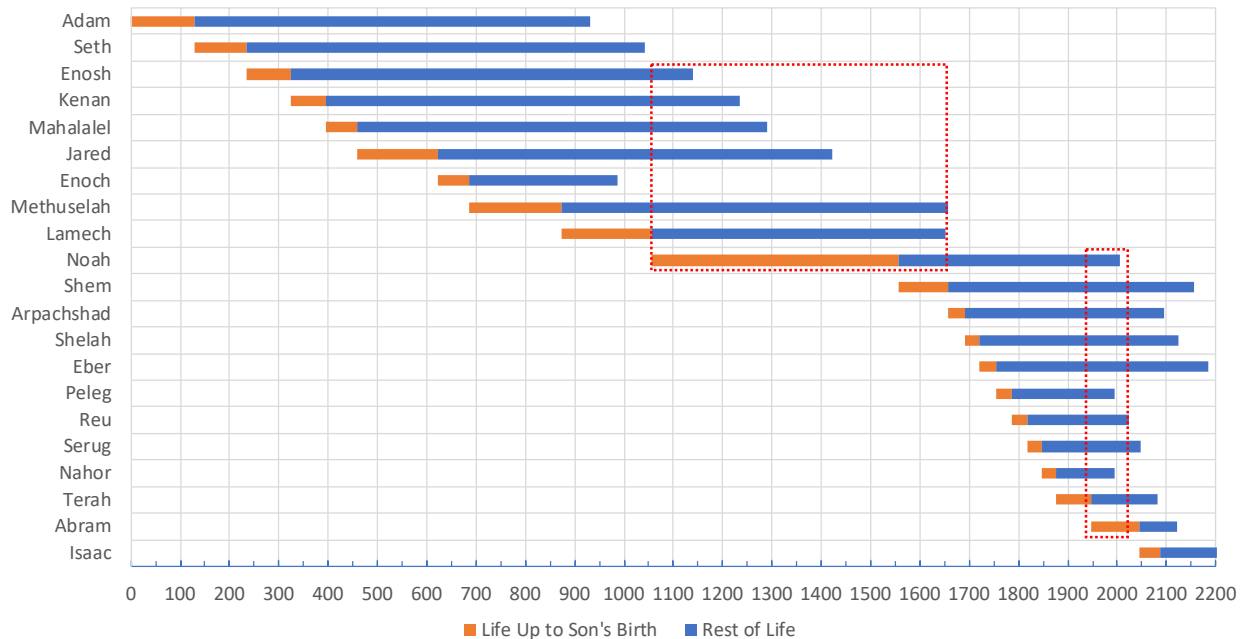
From the Old Testament, this dissertation examines vignettes about seven temporal and

¹⁵¹ Walter Brueggemann, *Biblical Perspectives on Evangelism* (Nashville: Abingdon Press, 1993), 47.

cultural situations: (1) creation, (2) the flood, (3) the patriarchs, (4) the seeds of a nation, (5) the unified kingdom, (6) the end of the divided kingdom, and (7) the exile. None of the Old Testament individuals evaluated died as martyrs, although Jonathan died in battle. See Figure 7 for the temporal relationship of Adam, Noah, and Abraham along with the intervening generations. They did not quite span a two-millennia range, but their historical oral tradition and spiritual insights were passed on over this wide time range. This was information passed on orally from generation to generation. The long lifespans of pre-flood individuals made extended spiritual social networking and shared spiritual formation possible.

A key champion is Noah. The red dashed boxes show his multi-generational dialogue engagements:

Figure 7. Old Testament Lifespans and Genealogies with Noah's Key Overlaps



The red dashed boxes show how Noah had access to six previous generations of his elders before the flood, and the ability he had to pass on this information first hand to ten generations, including Abraham.

From creation, Adam had to deal with a huge spiritual letdown, once knowing free and unencumbered fellowship with God, and then having to know fear, shame, and remorse. He could never go back to what he knew before. His spiritual world was shattered, and he had to

begin the journey of restoration. The stories he knew and the connection with God he had would have been passed to many generations for nearly a millennium. Adam walked with God, naked and unashamed. He had connection with God and had no need to be transformed, since he was already in the right position spiritually with God. He was created in the image of God and designed to rule over the earthly creation. After Adam's decision to choose sin rather than God, their relationship immediately deteriorated. The rest of man's story has been one of trying to reconnect with God.

Mankind continued to deteriorate spiritually, and when God chose not to allow it to continue, He decided to destroy the earth while saving one family. Noah was the head of that family and was the last to have an extended life, lasting closer to a millennium than a century. Through his extended lifespan, he had the opportunity to pass on to multiple generations the oral tradition of man's historical relationship with God. Noah would have known the grandson of Adam. Noah's depth of relationship with God was great enough for him that he would have called on the name of the Lord. God spoke with him and told him to build an ark. Noah was faithful in his mission, even when it did not make sense to those around him. From the time of the flood, he had the opportunity to transfer the oral tradition, spiritual knowledge and practices, and character formation he had received to others. As shown in Figure 7, although Noah would not have met Adam, based on the genealogical records of Genesis 5, Noah would have been able to know Adam's grandson Enosh for approximately 80 years. Therefore, from Enosh and about two more generations with Kenan and Mahalalel (Enosh's son and grandson), he could have internalized the truths of walking with God. Noah brought this knowledge this into the post-flood world. From the generation of Enosh, men began calling on the name of the Lord (Gen. 4:26). This would be another aspect of the spiritual formation intergenerational influence Noah

experienced.

The patriarchs were a key generational group of individuals that God ordained to use in order to fashion as-a people He would call his own. Abraham proved his faith in God, even being willing to sacrifice his only son born to him from Sarah. Isaac grew up knowing that he was a child of promise, along with his son, Jacob. This formed an aspect of the “blessed to be a blessing” mandate (Gen. 12:1-3). Unfortunately, there were sinful examples passed on, such as Abraham telling half-truths when he was concerned for his safety (Gen. 20). Isaac would do the same (Gen. 26:6-11). Jacob, though still in the line of promise, revealed more character issues, cheating his older brother out of his birthright and blessing (Gen. 27). For a season, he also went to the old home of Abraham and his ancestors in Paddan-aran rather than the future land of promise (Gen. 28). Abraham was the first in a new movement of God extending from the lineage of Adam, then through the narrowed lineage of Noah, to developing a nation that would be blessed to be a blessing. According to the genealogy of Genesis 11, when Abraham was born, Noah would still have been living. This creates an 80-year window during which Abraham could have gone back to this historical source. He could have conversed with a fourth descendant of Adam, one of those who were influenced by patriarchs who called on the name of the Lord throughout the generation of Enosh. This would have been a rich spiritual base Abraham could draw upon. Insights about God from Noah would have been defined more in terms of the specifics on salvation and the character of God than the new experiences Abraham received from God intervening in his life. Abraham would come to know *El Shaddai* and the life of faith God challenged him to live. He was given the promise of a great nation, but his faith was stretched. An example of this testing was having a child of promise, and then being asked to sacrifice him.

Isaac was the first member of the Abrahamic line to be born in Palestine, which would

later become the promised land. He would have learned of their family history. In his spiritual formation, he would likely have heard the stories of Noah from his father, the calling on the Lord from Enosh's generation, and the life with God that Adam had experienced. Abraham experienced the angel of the Lord saving his life and not being sacrificed. He was also personally given the Abrahamic mandate (Gen. 26:23-24).

Jacob had his spiritual transformation clearly given to him, with his name being changed to what would become the emerging nation. He experienced both the old and the new. He knew Palestine as well as what would eventually become the promised land. He also went back to the land of his great grandfather, Terah. There, God engaged with him directly through dreams and visions (Gen. 28:10-22). Jacob would have heard about the revelations that came from his grandfather Abraham (and the family of Terah his father), stories of Noah, the perseverance of a faithful remnant through the flood and a new world, what Noah conveyed about calling on God from the generation of Enosh, and the creation account with Adam. He would pass this on to all of his children, and it would be engrained into their family clan heritage that slowly was forming into the precursor for a nation.

Joseph had high self-esteem and confidence in his family situation. He had no problem telling his brothers and his parents what he thought and described powerful dreams of him being a leader over them all (Gen. 37:1-17). Experiencing betrayal and being sold into slavery by his family were extremely difficult, but Joseph grew despite these experiences, leveraging his strong character and abilities. Eventually, he became a ruler and key figure leading to the formation of the nation of Israel (Gen. 41:38-49).

Moses was born into the time period when the birth of Israel was in its forging crucible. Moses was the adopted son of Pharaoh, who did not know Joseph. For his first forty years, he

would have learned about the Egyptian heritage. Then for the next forty years, he found solace as an exile and formed a family and a community within his true Jewish heritage. In his final years, God called him from a burning bush and led him to his true calling of prophet and the first spiritual leader of Israel. Even though Moses was a stutterer, he went before the pharaoh, his step brother, and demanded the will of Yahweh. He clearly had an upward trajectory with his spiritual formation, even to the point of having a face radiant with the glory of God from a mountain top experience. Over his life, he learned the works of God and His people and began writing it down; this was something that had to be preserved. With the years of Israel's slavery, perhaps the stories had begun to fade. However, they had to be kept for the future. He received the Ten Commandments directly from God. Therefore, he was recording the past, but also documenting the present with the Israelites' specific laws, salvation history, and treasured works of God.

David was known as Israel's king, and was a man after God's own heart. Even though he sinned as an adulterer and murderer, he had a deep connection with God, who saw his repentant and seeking heart. Everyone is blessed with David's psalms, which give readers comfort in their challenges and allows them to come alongside David and see how God answered his prayers in the manner He saw fit. One can ponder the Scriptures and seek to be transformed by calling out to God, as David did, knowing he or she needs Him for his or her spiritual formation.

Jonathan was probably raised under a theocracy like most Jewish boys at that time. God was their king. But Israel wanted to be like other nations, so they forced Samuel to provide them a human king. As a result, Jonathan's life was elevated from a boy to a prince. A deep part of his spiritual formation was tied to the relationship he had with David. The Holy Spirit was working through David, as God's anointed. There was a rich spiritual connection that sustained them both. Jonathan was willing to give up his future as a king, and instead submit to the will of God

and support David. Jonathan never made it into this position, as he died along with his father Saul, who was not able to follow God faithfully and instead chose to act in his own power rather than that of the Lord. Saul grew impatient and did not work with his anointing as the first king. Jonathan and David established a powerful friendship, which provides a good example of what a healthy spiritually connected friendship can offer. Both were spiritually strong as a result of their mutual investment. Jonathan was willing to yield to the will of God that anointed David to be the new king rather than demand he become king.

During the end of the divided kingdom, Jeremiah, the weeping prophet (Jer. 31:27-34), had a very difficult situation. Jeremiah warned the decaying nation of Judah that they had to repent. They had reached the point of no return. God was going to send them to captivity, and they had to accept this judgment. Jeremiah was the weeping prophet and was not liked due to his harsh message that many did not want to hear: Judah was going to be punished. He called the failing nation to submit to God's punishment and constantly had to deliver harsh news to the many who preferred to remain in denial; they would rather shoot the messenger and hope for the best. God sustained Jeremiah through this experience.

In the time of the exile, Daniel was carted away into Babylon. Daniel was brought into a life of captivity and sought to do the best he could in a foreign land, trying to stay faithful to Yahweh. He prayed, as Jewish tradition directed, and kept a kosher diet, even though it meant turning down Babylonian delicacies. Showing himself as a capable youth, he passed exceptionally well all the filtering and training requirements he was subjected to. However, in the midst of this, he never forgot his true spiritual identity. He was committed to Yahweh and embracing the spiritual life and practices that had been good to him. Humbly praying to God, he received answers, obtaining the wisdom and understanding to interpret the king's dream. All of

this displays a spiritually faithful life, even when the external evidence indicated he should choose a different path and compromise. No matter what happened, he would not waiver in his faith. God blessed him, elevating him to be the ruler over Babylon. At this level, he was able to serve the Lord and engage with Nebuchadnezzar, Belshazzar, Cyrus, and Darius.

Passing On Spiritual Formation in the Midst of a Developing Nation

As the Jewish national identity developed, there was a more focused spiritual and cultural context from which individuals could begin their spiritual formation. Still, all the way back to Adam, God reached out to individuals and revealed Himself in a way they could understand. God gave them enough to reach the spiritual level He wanted them to have. As highlighted in Figure 7, Noah was a key individual who knew about life in Eden and could communicate this directly to Abraham. Noah could have communicated with six eyewitnesses who could have communicated with Adam and heard his stories: Enosh, Kenan, Mahalel, Jared, Methuselah, and Lamech. With Noah's long life, he could have communicated this directly to Abraham over an 80-year period. This information about the life of Adam, from two thousand years in the past, would have been just four generations removed. There was the opportunity to pass on life lessons in spiritual formation and share the common legacy they had tracing back to God and life in Eden. Nine other generations in Noah's family line would also have heard Noah's story and been able to participate in the passing on firsthand of information to Abraham: Shem, Arpachshad, Shelah, Eber, Peleg, Reu, Serug, Nahor, and Terah. Even the names of God that He used to reveal Himself showed a gradual deeper revelation of His nature as suggested by the meaning of the names He used to reveal Himself by: *Elohim* (God, a more general name), *El Shaddai* ("All Sufficient One," describing more about His nature), and *Yahweh* (God's most revered name by the Jews, "I am Who Am"). They all are connected with the same God. Some, like David,

Daniel, and Moses, had more spiritual development based on the circumstances in their lives (and what one knows from the writings available to us). Through trials and tribulation, they reached their rock bottom point, called out to God, and developed a deeper relationship with Him. One sees David's laments, repentance, and calling out to God in his psalms. One sees Daniel's faithful commitment to prayer, even if this meant his arrest and punishment. One sees Moses' intimate connection with God, even asking to see God's face. God let Moses see His glory, and Moses' face shone with His radiance.

Honorific Generational Age Argument

In *Discovering the City of Sodom*, Steven Collins and Latayne Scott consider the age chronologies of the Old Testament as a part of their assessment. Establishing the right dates for the life of Abraham is useful for their assessment. They argue the generational ages of forty years that are often used may not be accurate and instead argue for generational ages of twenty-five years. Instead, of a literal understanding of these dates, Collins and Scott suggest the possibility that these could be honorific dates. If this is correct it would compress the ages of the timeline, but the overlap of generations would still be present.¹⁵²

The impact of spiritual social networks takes place mainly in face to face interaction, but also remotely through written material and other means of communication like oral tradition, and, today, through online media sources. The impact of innovation champions and social networks can be even greater with online content, which includes sources like social media. Thus, it is not necessary that there be physical social or community contact for an impact to take place.

¹⁵² Steven Collins and Latayne Scott, *Discovering the City of Sodom* (New York: Howard Books, 2013), 137, 143, 146, 240, 254.

The Role of the Family and Relationship

Family and relationships play an important role in passing on faith from generation to generation. The impact of passing on faith can be biological and spiritual. Brueggemann develops these concepts of the significance of family in his study on different modalities in the taxonomy of evangelism. This idea of the importance of family relationships is set out conceptually in Psalm 78:1-8, where one sees the importance of passing on the things of the Lord to the next generation, as well as in several independent texts in the Hexateuch (Ex. 12:26; 13:8-14; Deut. 4:5-9; 6:4-9; 20-25; Josh. 4:6-7; 20-24; Judges 5:10-11). One can also see examples where this important relational element did not properly function. For example, in Judges 2:10-13, there is an indication that this procedure for passing on the faith to the next generation did not occur in Joshua's generation.¹⁵³ Brueggemann spells out below what the heart of evangelism should be along with the familial or relational context in which this needs to happen:

Imagine the church as the place for an alternative conversation. In a society of denial, as the church we speak what we know, evoke resistance and yearning, permit alternative, authorized newness. As liberals and conservatives, we could settle for shared acknowledgment that the church is this relentless conversation, bearing witness to the news in the face of all brands of fear and ideology. The subject of the evangelical conversation is how our life, our bodies, and our imagination can be weaned from the deathliness of the world to the newness of life in the gospel. It is a conversation to which all are invited. From our several enslavements we are summoned to a common, liberated obedience. That conversation is difficult and unfinished. It is a conversation that promises our life shall come together in wonder, love, and praise.¹⁵⁴

UNIT 2: New Testament Spiritual Formation

The level of understanding for spiritual formation and transformation grew significantly by the works of Jesus on earth. He modeled for mankind what a person could do being fully

¹⁵³ Walter Brueggemann, *Biblical Perspectives on Evangelism*, 14-47.

¹⁵⁴ *Ibid.*, 47.

yielded to the will of the Father. Praying all night, fasting forty days, remaining faithful in His fellowship with the disciples, and other spiritual disciplines all kept Him able to do the Father's will. A cornerstone of the Christian faith is Jesus dying for man's sins and then rising from the dead. One celebrates the resurrection, and in terms of spiritual formation and transformation, the resurrection was a key event that was the mountain-top experience for eyewitnesses. The stories of these encounters were told often. People were eager to hear about them and they were shared in the oral tradition, notes, letters, and then the Gospels. Within the New Testament, one sees examples of evangelical outreaches, revivals, and awakenings. Peter was the spokesman highlighted at Pentecost who conveyed the truth of Christ in a miraculous way where all of the people present heard the Word in their native tongue. As one moves through Acts, there are more examples of the works of Paul as he demonstrates his missionary skills. One can observe what was done in these evangelical and spiritual formation situations and seek to apply them in his or her life and ministry today.

Transformed Lives in the New Testament

There were transformations that took place from Christ's engagements and His resurrection. The story of each of these individuals shows interesting aspects of the transformation that came about from experiencing the risen Christ, based on the encounters they had with Him. Each person had at least one highly impacting experience with Christ that transformed him at a very deep level.

Jesus, of course, is the main event. He was perfectly spiritually formed in regard to His being fully God. By being fully man, he knew all the spiritual disciplines He had to use. For His well-being, He vigorously pursued these disciplines in a meaningful way to maintain a continuing relationship with His Heavenly Father. He modeled communion with God, working

in a small group, acting as an innovation champion, and acting on an *Imago Dei* calling, and He did it so individuals who wanted to know how He did could observe and follow in His practices. Oftentimes, Jesus conveyed multiple parallel messages to various groups around Him when he spoke, such as (1) His disciples, (2) the larger group of Christ followers, (3) the multitudes, (4) His adversaries, (5) the Jewish leadership, and (6) the Roman government.

John had a close relationship with Jesus. He was the youngest apostle, so he knew Jesus when Jesus was young. In his gospel, he calls himself the beloved disciple, so he had a very personal and transformational experience with Jesus, and ultimately the risen Jesus. Through his gospel, one sees his emotional and relational depth. His life extended for decades after his encounter with the risen Christ, lasting towards the end of the first century. Not only did John take in his experience with Christ; he gave it away. He took on disciples, like the pattern of Jesus who took on disciples. Tradition says that one of these was Polycarp, who was personally mentored by John and was chosen as bishop of Smyrna (modern day Izmir in Turkey) by a subset of the apostles. He was able to give this real experience of the risen Christ to Polycarp. Part of the ministry of a church community was now about passing on the experience of the risen Christ.

Peter had the start of a relationship with Jesus stemming early on in Jesus' ministry with Jesus healing his mother of a fever, even before he was formally called to be an apostle (Luke 4:38-39). He rightly identifies Jesus as the Christ (Matt. 16:16). Jesus helped Peter grow in His understanding of the Living Word as he grew from being a fisherman to becoming a sold-out follower of Jesus Christ. Peter was excited and actively engaged with Jesus, even walking on the water at Jesus' bidding (Matt. 14:22-33). Peter still faltered and denied Jesus three times (Luke 22:54-62). Yet after His resurrection, Jesus asked Peter if he loved (*agape*) Him three times

(John 21). Peter experienced a low point of denying Christ, but soon afterwards, he was invited by the risen Christ to reframe his failure in denying Christ three times by committing to Jesus that he loves Him three times, locking in his commitment to Jesus and his *Imago Dei* calling. The love of Jesus was firmly set, and he could reflect back on it when the difficult challenges would come in his future. According to Acts, Peter was key in the early development and evolution of the church, which included him sharing the good news in early outreaches in and around Jerusalem. He was a key player in the signs and wonders accompanying the revival, conviction, and evangelical outreach that took place with the gift of the Holy Spirit at Pentecost (Acts 2).

Paul worked as actively against the Gospel as he did for the Gospel after his dramatic conversion. Saul of Tarsus was transformed into the missionary-minded Paul. It took being blinded and knocked off his horse to change his direction. He had a significant encounter with the resurrected Christ that stayed vivid in his mind and was something he would describe during his apologetic and evangelical dialogues (Acts 9). He was a transformed man because he had a first-person encounter with the risen Christ. He wanted to get more insight into the Gospel and therefore spent time with Peter, James, and John in order to learn as much as possible about Jesus. He was filled with the power of the Holy Spirit and was forever changed by his experience with Jesus. Paul experienced an extreme low, killing Christians and his early zeal, only later to experience firsthand the risen Christ and be radically transformed. His zeal became focused on Christ, and the impacting experience of Christ stayed with him as he shared often in his sermons (Gal. 1:13-17; Phil. 3:4-6; Acts 7:54-8: 1; 9:1-22; 22:1-16; 26:9-23). Paul was skilled in evangelism and was diligent in his ministry labors to get the word out and to disciple new believers. He pressed on in missionary work, eventually in an intentional fashion choosing to

focus on ministry to the Gentiles (Acts 13:46). Paul was also adept at relating and contextualizing the Gospel to the culture he was in. This is seen with him relating the true God to the “temple of the unknown god” at Mars Hill in Athens (Acts 17:22). He also worked with those that wanted to dig into the Scriptures and see if the things he claimed were true in Berea (Acts 17:11). Finally, he worked closely in establishing church plants and making sure they were healthy with well-trained leadership. Ephesus is a good example (Acts 18:10-19:41). Paul’s ministry is highlighted in Acts, his letters, and the letters of other New Testament writers.

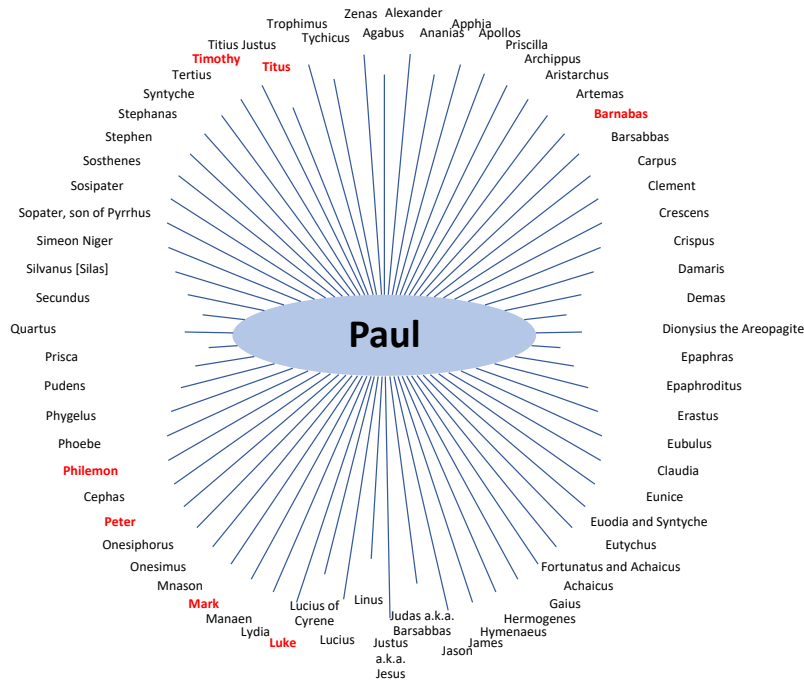
Paul’s conversion created a significant emotional experience from which he could clearly point out how Jesus sought him out directly and personally changed the course of his life. He experienced a radical spiritual transformation in changing from Saul of Tarsus, a disciple of Gamaliel, to Paul, a bond servant of Christ. After his conversion, he matured spiritually in close fellowship with believers and the apostles. He determined that his mission should focus on the Gentiles, adopted a Greek lifestyle, and was actively engaged in his missionary journeys. He was diligent in getting the word out and planting the seeds for evangelism and revival. He brought disciples and ministry partners with him. Therefore, he engaged in fellowship, discipleship, and growing leaders as he was active in ministry. Additionally, he had the power of his written word. This may have been his most significant contribution. For people today, this is definitely the case. Paul’s letters were read and circulated, showing their value and how the essence of God’s word can be passed on and shared again and again, ministering to many. This shows as example of how acting on one’s *Imago Dei* mission aligns with being an innovation champion. Others will be drawn to the message it contains since it contains the words and power of God. Finally, Paul showed his skill in church planting. He not only evangelized, but he also helped congregations form and mature. He gave a lengthy investment of time to several early churches,

especially Ephesus and Corinth.

Of all the Bible's writers and those who have been written about extensively, Paul stands out as an individual whose social network was well known. Figure 8 below tries to capture this idea. A total of approximately sixty-nine unique names are captured in this figure. Note that some individuals are referred to by several names, like Peter and Cephas. The names in red are individuals who have the most prominent roles in the New Testament and have had engagements with Paul.¹⁵⁵ With his evangelism, church planting, discipleship, leader development, and active writing to churches, Paul was continually working to pass on the spiritual truth he received. Figure 9 shows the categories of Paul's spiritual social network. In terms of categories in his spiritual social network, Paul had (1) a meaningful relationship with God, (2) a good relationship with his Jewish teacher and mentor Gamaliel, (3) a strong dependence on the apostles and their teachings, (4) working together with his co-laborers, and (5) those that he mentored. The names with an asterisk are reviewed in this section. Representatives from three of the five classes of Paul's social network are evaluated in this section, thus showing his significance.

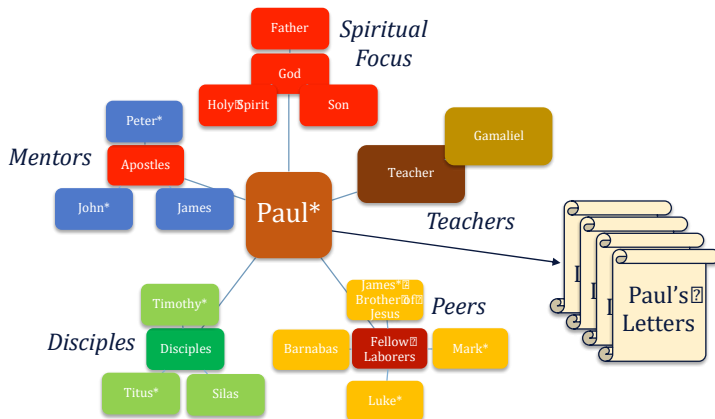
¹⁵⁵ Felix Just, "Paul's Associates and Co-Workers," http://catholic-resources.org/Bible/Pauline_Associates.htm, accessed July 3, 2018.

Figure 8. Associates of Paul



Examples of key New Testament individuals associated with Paul are shown in red.

Figure 9. Key Spiritual Network Components of Paul



This figure shows Paul's connection with God, fellow apostles (mentors), his disciples, and fellow workers. Individuals with a "*" are examined innovation champions. His letters were key to influencing his network, so they are included as well.

James, the brother of Jesus, had an interesting family that some would envy. As the brother of the Son of God, one could easily develop an inferiority complex from such a situation. Yet he came to a saving understanding of exactly who his half-brother was, recognizing Him as the Christ.

Luke, the physician, was engaged in Paul's ministry and was an active part of the works of God, serving on at least one of Paul's missionary journeys. Luke, who was a mission partner of Paul, traveled with him on at least one of his missionary journeys. He may have been a physician for Paul, helping Paul with his thorn in the flesh, while he took in Paul's teaching. In Acts, one sees how Luke transitions to first person plural when he talks about Paul's missionary journey, which is a good indication he was there (Acts 15:36-41).

Mark (also known as John Mark) was a ministry partner of Peter who faithfully sought to write down the things he heard from Peter. He took to heart everything he heard from Peter, eventually writing in down in his early gospel account. Mark has vivid accounts of Peter in his gospel, including his weaknesses, as Mark accurately recognized Jesus as the Christ but gave Jesus bad advice about not suffering the cross and had to be admonished (Mark 8:27-33).

Matthew (Matthew Levi) was transformed from a tax collector to a fisher of men. Jesus called him from his tax collector's booth, perhaps as he was collecting taxes from fishermen in Galilee. With his profession, he would have been able to read and write. As he considered, along with the rest of the apostles, where to evangelize, it is said he went to Ethiopia to minister the Gospel.¹⁵⁶

Thomas took extra work to be convinced that Jesus was the risen Christ. He could not just be satisfied by the testimony of the other disciples. Jesus was not put off by his doubt, but instead engaged with Thomas at his point of need. Jesus encouraged Thomas to touch his hands and side and see the healed wounds. This was enough to convince Thomas. Tradition tells us he

¹⁵⁶ Socrates Scholasticus, *Ecclesiastical History (Ante—Nicene Fathers Volume 2)*, Edited by Phillip Schaff. Grand Rapids, MI: Christian Classics Ethereal Library, 2009), 71.

went on and actively shared the Gospel, all the way into India.¹⁵⁷ Thomas offers an example of individuals who need extra evidence. He received that evidence—and one now has the record of his experience; one has an example of a skeptic being won over. This provides an additional apologetic resource as a result. It is okay to want evidence. One can have that evidence, and a skeptic can get his or her questions answered. Even though Thomas needed extra evidence to shore up his faith in the reality of the resurrected Christ, he was not denied. He saw and touched Jesus, and all his doubts were gone. He could respond with a full spirit that Jesus was his Lord and God. Having received this fullness, he ventured far to the east. On the mission field of India, he had to adapt to a different culture outside the Greco-Roman world and contextualize the truth in the way they could understand it. Due to cultural differences and the strong focus on oral tradition in India and thus their means of passing on their history, there is no written record from this time similar to the Greek manuscripts from the ministry to the Greeks.¹⁵⁸

Therefore, these preceding examples have described the impacting events and life transformations that took place as a result of these events. Their faith and commitment to their *Imago Dei* calling was locked in by a power encounter with the risen Christ. Jesus had enough encounters with individuals in His risen state that the early church could have this golden nugget available to build the faith of individuals.

The Impact of Experiencing the Risen Christ

Seeing the risen Christ was the ultimate fulfillment of the promises Jesus gave his followers. He did the impossible and overcame death. There are examples of Paul talking about his experience with the risen Christ that show the impact and importance of experiencing Christ

¹⁵⁷ Sean McDowell, *Fate of the Apostles* (New York: Ashgate Publishing, 2015), 224-225.

¹⁵⁸ *Ibid.*, 157-158.

had. Since he used it in his testimony, it is clearly significant. His experience with the risen Christ helped him in his own spiritual life, and it was an amazing story recounting the teachings and ministry of Christ, and revealing the transforming power of Christ in Paul's life. There are four ways the encounters with the risen Christ were shared in the early church: (1) recalling and sharing personal encounters with the risen Christ, (2) listening to others share their encounters with the risen Christ, (3) repeating the story of others' experiences with the risen Christ, and (4) writing down and reading the story of encounters with the risen Christ. Paul did all four of these in his very active missions-oriented ministry, sharing among others in community the experiences of the risen Christ and writing it down as another way of sharing it. The early creeds and oral tradition captured the importance of the risen Christ. Twice in Acts, Paul uses his experience of the risen Christ as a key part of his testimony. In Acts 22, he uses it as part of his defense when confronted after his arrest in the Jerusalem temple by the Jews. In Acts 26, he uses it again in a more detailed form when sharing his testimony with King Agrippa.

The Enabling Role of the Holy Spirit

Jesus rose from the dead, and the disciples experienced first-hand the risen Christ. He fulfilled His promise and showed He fulfilled His promise of rising from the dead to them first hand. It was an emotionally charged moment that was seared into their memories. They thought about it, they talked about it, they listened to other individuals' stories about it, and they wrote it down. There is more to experiencing the risen Christ than just a good memory. The Holy Spirit engages with believers in several ways. The risen Jesus promised that the disciples would be clothed with power from on high. Everything Jesus taught the disciples would be brought up again with the engagement of the Holy Spirit. No believer is alone; all believers can have a source of guidance through the guidance and mission of the Holy Spirit in their lives.

Paul made it clear that he was determined to know and share the risen Jesus when he preached. When writing to the church at Corinth, Paul talked about his focus on knowing the risen Jesus and his reliance upon Him (1 Cor. 2:1-5). Paul had his personal encounter with the risen Jesus, and after that, with the working of the Holy Spirit, he could effectively convey what God wanted, even in the midst of his human weakness. Every encounter Paul had where the Spirit would work through him would enhance Paul's understanding that the Holy Spirit and the power of the Living Word to help mankind. There is a direct connection between the mind of God and the believer. There is an inner witness and a personal testimony in the believer that he or she is a child of God. By the presence of the Holy Spirit, there was a mechanism by which Jesus's disciples received the knowledge and recognition of their union with God.¹⁵⁹

My claim is that this reality would have a huge motivational impact on eyewitnesses and those who learn of it through the reliable sources in the New Testament. Experiences of the working of the Holy Spirit and the power of the Living Word would even impact a believer's biology in areas such as epigenetics. Habermas agrees with Paul Mosler that a Christian theory of knowledge should embrace the central role of the testimony and power of God's revealing Spirit.¹⁶⁰ There is a dimension of knowing Christ deeply in an intimate, loving, and transforming way that reminds one of the personal relationship he or she has with Christ. Man's relationship with Christ is not just an intellectual exercise. It is complete trust and connection to a personal mediator and not just a collection of precepts and values.¹⁶¹ Jesus was so real to the disciples that they counted it an honor to be considered worthy to suffer in the name of Christ. Throughout

¹⁵⁹ Gary Habermas, *Risen Jesus* (Oxford: Rowman & Littlefield Publishers, 2003), 200-201.

¹⁶⁰ *Ibid.*, 204.

¹⁶¹ *Ibid.*

their hardships, they focused on the risen Christ and sought every possible chance they could to share Him with others (Acts 5:33-42).

UNIT 3: Early Church Spiritual Formation

With the passing of the apostles, there was a gradual shift from leaning on eyewitness testimonies to something that could give the same message to all future generations. The formation of a canon, the establishment of a more formal church, and the mentoring from one spiritual generation to another had to be structured. It was important to ensure sound doctrinal integrity. After a formal church structure was in place, the church was, in effect, sitting again at the feet of Jesus listening to what He had to say. Now, everything that has been written down in Scripture can come to life for believers in spiritual communities.

Transformed Lives in the Early Church

The Bible is full of stories of changed lives. Each one is worth studying. One sees examples of multigenerational spiritual networks and can trace the results of those influences. Timothy was a disciple of Paul. In a term of endearment, Paul called him his “beloved son” and “true child” (*teknon*). Timothy developed his leadership skills and became a church leader in the church at Ephesus that Paul founded. In the New Testament, one sees Timothy in the first half of his ministry. Paul uses him so much that he lists him as co-author of 2 Corinthians, Philippians, Colossians, 1 and 2 Thessalonians, and Philemon. One reads about his conversion in Acts 16. In the works of the early church fathers and Eusebius, one sees how he became a church leader and helped in the establishment of the church. He witnessed many of the things that Paul did. He had a Greek father and Jewish mother. He not only was an eyewitness to Paul, but also to John. He was martyred in Ephesus when he stood up for righteousness and condemned the Ephesians’

focus on idols rather than the one true God.¹⁶² He was the first to receive the episcopate of the parish in Ephesus.¹⁶³ When Timothy was young and needed direction, Paul gave it to him, and he became spiritually transformed. He grew from a disciple of Paul to being able to lead the strategically located church of Ephesus that Paul established. Thanks to Paul's mentorship, he could walk in the spirit and help a heathen culture with outreach and evangelism.

Titus is another disciple embraced by Paul, who called him a true child (*teknon*) in Christ. He poured his life into Titus. As his faith and skill developed, Titus became a church leader and was situated as a representative of Paul at the church in Crete, which Paul had founded. Titus was helpful for that church, since it was just getting established. Titus came from the royal lineage of Minos, king of Crete. He felt called as a result of a voice telling him to save his soul instead of devoting his time to the poems and dramas of Homer. It took nine years, but at age 29, he dedicated himself to the Lord upon learning how the Lord saved Israel in Isaiah. His uncle, the proconsul of Crete, sent him to learn more about Jesus in Jerusalem. There he was saved. He saw the death and resurrection of Christ and the pouring of the Holy Spirit on the apostles. He was part of the 120 following Christ who were with the twelve disciples, and the 3,000 who came to believe Jesus through the ministry of Peter. He became one of Paul's disciples and traveling ministers, working in places like Antioch, Seleucia, Cypris, Salamis, Pahos, Lystra, Derbe, Philippi, and Rome. Since Crete was his home, he was a natural fit to return there and

¹⁶² Cavan W. Concanon, "The Acts of Timothy, A New Translation and Introduction," Tony Burke and Brent Landau editors, *New Testament Apocrypha: More Noncanonical Scriptures* (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co., 2016), 395-405.

¹⁶³ Eusebius Pamphilius, "The Church History of Eusebius." In *Nicene and Post—Nicene Fathers Series Volume 1*, 1—1651. Edited by Phillip Schaff. (Grand Rapids, MI: Christian Classics Ethereal Library, 2009), 265 (Section 3.4.6).

become the Bishop over the churches in Crete (stationed in Gortyna).¹⁶⁴ ¹⁶⁵ Titus risked everything he had with his royal family by accepting and staying faithful to Christ. After experiencing the risen Christ and spending time with the apostles, he eventually went home and became a leader over the church in Crete. Paul called him his beloved son and trained him so he could lead a church and have a firm foundation in the Gospel. He had internalized the Gospel message from seeing the risen Christ himself, working with the disciples, and then owning it in his life.

Polycarp is a good example of a disciple of the apostles, especially being a disciple of John, who followed Jesus and the disciples' footsteps and was key in the early church development. Irenaeus (who was a disciple of Polycarp) wrote about Polycarp, and Eusebius used this information as he presented his historical framework of the development of the early Christian church. Polycarp spent time with and was trained by the apostles. He heard firsthand the stories of Jesus and the apostles' encounter with the risen Christ. He had a long life and was faithful to the Gospel, which he shared with those to whom he ministered. The apostles saw his leadership qualities and understanding of the Gospel, so they appointed him bishop of Smyrna. With the growing influence of Gnosticism in his day, Polycarp was able to turn many people away from such heresies and back to the true Gospel. Since Polycarp received the Gospel directly from those who received it from the source, Jesus Christ, he had a strong awareness of an experience of the risen Christ.¹⁶⁶ Polycarp had the same committed heart to the Lord as the

¹⁶⁴ Richard I. Pervo, "The Acts of Titus, A New Translation and Introduction," Tony Burke and Brent Landau, eds, *New Testament Apocrypha: More Noncanonical Scriptures* (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co., 2016), 406-415.

¹⁶⁵ Eusebius Pamphilus, "The Church History of Eusebius," 265.

¹⁶⁶ *Ibid.*, 422-436.

disciples, being willing to die for the cause of Christ.

The persecution of the early church had intensified around Polycarp. Yet, in the midst of this, he maintained his serenity and faithful ministry work. He had internalized the truth of the Gospel through the lives of the apostles who faithfully lived out this truth. Polycarp was a changed man and practiced everything he was taught. Reading through Polycarp's Epistle to the Philippians, one sees how his letter reflects the influence of the apostles, and the early church writings that he would have seen. For example, his opening chapter reflects the words of Paul ("in view of your participation in the gospel from the first day until now" (Phil. 1:5)) and Peter ("though you have not seen Him, you love Him, and though you do not see Him now, but believe in Him, you greatly rejoice with joy inexpressible and full of glory," (1 Pet. 1:8)). In his letter to the Philippian church, he alludes to material from fifteen New Testament books, namely, Matthew, Luke, Acts, Romans, 1 Corinthians, 2 Corinthians, Galatians, Ephesians, Philippians, 1 Timothy, 1 Thessalonians, 1 Peter, 2 Peter, 1 John, and Jude. This shows his influences from John, Peter, Paul, Matthew, Luke, and Jude. Polycarp's epistle reads stylistically like one of Paul's letters. These ideas were burned into his thoughts and show up in his writings. He now owned in his character what was taught to him. Moreover, the Holy Spirit that was given to the apostles now worked through Polycarp as well. Polycarp was serious about his uncompromising commitment to the accurate truth and was repulsed by the Gnostic influences from individuals like Marcion, whom he effectively called the first born of Satan (Eusebius 4.14.7). His spiritual formation was so strong that he effectively knew the risen Christ and the Gospel. Anything that parted from this was offensive. He wanted to pass on the accurate saving Gospel.¹⁶⁷

¹⁶⁷ Ibid., 422-436.

Spiritual Disciplines Seen in the Early Church That Transform Us

The early church gradually developed from directly following Jesus' instructions to writing down and instructing others on what it meant to be Christ followers. Key spiritual disciplines that they practiced included the following: (1) Discipleship and mentoring; following the example that Jesus gave, the apostles mentored individuals who they could guide in their spiritual development. This is seen in Paul's investment in Timothy and Titus. (2) Church community involvement and membership; community was a big part of the early church culture (Heb. 10:23-25). Family and community were important. The early Church fathers formed tight-knit church communities where they would share their common spiritual experience. (3) Reading Scripture; they began sharing the oral tradition and stories about Christ (2 Pet. 3:14-16). Individuals wanted to hear as much as they could about Jesus. The oral tradition was very interesting to many. Over time, the message was written down, and letters were circulated. Additionally, the Jewish Scriptures now had greater Messianic meaning through the work of Christ. (4) Prayer; just like Jesus would pray all night, individuals were encouraged to invest in their prayer life (1 Thess. 5:16-18). Some would even pray and sing in the Spirit, which opened a direct spiritual form of communication with the Lord in the Spirit (1 Cor. 14:16). (5) Worship and singing; even in prison, the disciples would sing and worship the Lord (Acts 16:25). (6) Service; churches were serious about sharing with those in need and meeting the needs of individuals and communities (Rom. 12: 9-13). They wanted to pass on the blessing. (7) Tithing; sharing of individuals' wealth to bless others became something of value and a form of active participation in the lives of others (2 Cor. 9:6:8). (8) Evangelism; finally, the core mission of the

church focused on the imperative of giving away the Good News.

UNIT 4: Thriving in Our Ecosystem

This section examines current literature on how one operates in an interdependent ecosystem, which consists of one's connections with other individuals and the nurturing interconnections one experiences in social and spiritual networks. Each of the champions explored in this section had a network. There are a handful of questions one can explore by looking at these factors: How did God intend for people to operate in an interconnected ecosystem? How do social networks impact people? How do new ideas impact existing networks? How can each individual create, enhance, and effectively utilize for mutual benefit his or her network for God's purposes? How did Jesus create, influence, and revitalize others through His use of networks? Individuals are connected. Individuals are part of an ecosystem. Others impact one's ecosystem, and one's ecosystem impacts him or her. One can choose his or her own spiritual ecosystem. Intentionally or not, innovation champions are key instigators of change in their networks. Jesus showed people the way to act as innovation champions in their *Image Dei* mission and made Himself the center part of the community network by influencing and ministering to all and providing the spiritual nutrients all must have to grow in Christ in spiritual formation. In terms of outreach, as innovation champions, people impact their network. This can look like contagion to those outside the faith (having a contagious faith), and through spiritual formation, one impacts those inside the faith. Individuals are designed to grow God's network and transform the ecosystem with as many individuals as possible.

Craig Blomberg reflects on the importance of sharing a meal together in Ancient Near East and other cultures. He focuses on the impacts of this practice in Palestine during the time of Jesus. In the midst of the Jewish culture, Jesus broke the norms and set a new standard for

gathering. He went directly to the disadvantaged individuals and ate with them. These were individuals who were far removed from the vital nutrients of the Divine vine. He entered into their environment and created community through the effective dynamic of sharing a meal. He fed them spiritual food and transformed their networks through His influence.¹⁶⁸

Blomberg, referring to the work of Craig McMahan, notes that there are five common characteristics of Jesus' practice of having meals with outcasts. One sees these characteristics in the record from the Gospel of Luke.

- (1) Jesus or those He sent out ate with castaway second-class citizens in Israel.
- (2) These outcasts recurrently respond to Jesus' message with joy.
- (3) Pharisees and scribes, in contrast, protest and murmur about Jesus' behavior.
- (4) These events are regularly started with calls to discipleship.
- (5) The encounters conclude with a statement of Jesus' mission and redemptive intentions in order to disprove the protestations brought against His behavior.¹⁶⁹

According to Jesus' example, a key way of creating community and influencing others as an innovation champion is to enter into their environment and show acceptance. Once this happens, the group will more likely be willing to welcome a given message.

Borg notes how one sees Jesus operating in several different roles in the New Testament.¹⁷⁰ Jesus operated as a spiritual person and prophet. He had intimacy with the sacred and had the ability to perform miracles. He knew God the Father's power and was a channel for it in His ministry. Jesus could experience the vertical plane with God with His connection with the Father, and the horizontal plane of fellowship and community with others. As seen in the transfiguration, God knew Moses and Elijah intimately. One sees Jesus walk right into the

¹⁶⁸ Craig L. Blomberg, *Contagious Holiness: Jesus' Meals with Sinners*, ed. D. A. Carson, vol. 19, *New Studies in Biblical Theology* (England; Downers Grove, IL: Apollos; InterVarsity Press, 2005), 168-169.

¹⁶⁹ *Ibid.*, 130.

¹⁷⁰ Marcus Borg, *Conflict, Holiness, and Politics in Teach of Jesus* (New York: Continuum International Publishing Group, 1998), 1.

spiritual realm as He engaged with these spirit persons. Jesus also knew God, *Abba*, in an intimate way.¹⁷¹ In reference to Jesus' prophetic role, Borg argues that Jesus called the nation of Israel to compassion.¹⁷² With Jesus acting in the role as a sage, one sees the importance of heart. As a sage, Jesus acted as a wise man that others could come to and ask their questions and share their heart. Jesus was a teacher of wisdom. In this role, He developed teachings about God, the human condition, and the path towards transformation. Jesus clarified and further revealed what the Torah meant in terms of one's relationship with God and redemption, showing how everyone is a sinner and falls short of the glory of God. This clarification and application of truth is seen in His Sermon on the Mount. Simply breaking down the law to something that can be met from human terms like what the Jews did with the 613 laws in the Mitzvot¹⁷³ is not the point. Jesus instead tries to get at what is going on in people's hearts. The Hebrew Bible and rabbinic tradition suggest the heart is the consciousness (*psyche*) at the deepest level. Jewish scholars at the time of Jesus thought the heart was ruled by either good or bad inclinations. As a result, individuals could have good or bad hearts. In our collective human condition, in order to follow Christ, one must die to self. Humbling oneself and dying to self on a daily basis has to be part of one's transformation.¹⁷⁴ Jesus often proclaimed the Kingdom of God in His ministry; this was a new community, a new social network that was emerging out of the old, which was clarifying the depth and purpose of what had been revealed up to that point.¹⁷⁵

¹⁷¹ Ibid., 239-242.

¹⁷² Ibid., 246.

¹⁷³ Judaism: The 613 Mitzvot (Commandments). Jewish Virtual Library/ Accessed July 21, 2019. www.jewishvirtuallibrary.org/the-613-mitzvot-commandments.

¹⁷⁴ Marcus Borg, *Conflict, Holiness, and Politics in Teach of Jesus*, 248-252.

¹⁷⁵ Ibid., 256.

Impact of Our Network

Social networks shape our lives. Christakis and Fowler develop what they see are the rules of life in a network. They postulate several findings: (1) One shapes the network. Since people are engaged in the network, what they do has an influence on them. (2) Networks shape individuals. One is connected to other individuals and is shaped by these connections. (3) One's friends affect the individual. One is connected to friends and engaged in others' lives. (4) There is observable evidence that one's friends' friends' friends (three levels away) affect that individual. An interesting development is that one is not just impacted by immediate friends, but by three levels of friends. (5) The network has a life of its own. Even when specific individuals may leave, the network still continues in its impact.¹⁷⁶

Christakis and Fowler looked carefully at emotions and emotional contagion. People can catch emotional states from other in a matter of seconds to weeks.¹⁷⁷ Not only is one influenced by friends, but in detectable ways, all the way out to friends of friends of friends.¹⁷⁸ Another interesting behavior they noticed was that social networks stay intact even when individuals come and go.¹⁷⁹ As noted by Lowe,¹⁸⁰ Christakis and Fowler specify a straightforward definition of a social network as a network built around two things: individuals and the connections between them.¹⁸¹ While they classify connections as the basis for the formation of a social

¹⁷⁶ Nicholas Christakis and James Fowler, *Connected* (New York: Bay Back Books, 2009), 16-24.

¹⁷⁷ *Ibid.*, 35.

¹⁷⁸ *Ibid.*, 298-299.

¹⁷⁹ Nicholas Christakis and James Fowler, *Connected*, 290.

¹⁸⁰ Stephen and Mary Lowe, *Ecologies of Faith in a Digital Age: Spiritual Growth through Online Education*, (Downers Grove, IL: InterVarsity Press, 2018), 122-123.

¹⁸¹ Nicholas Christakis and James Fowler, *Connected*, 13.

network, they also note that what actually passes through these connections is vital.¹⁸² Social interactions specify personal relationships that are strongly connected in established networks of trust and reciprocity.¹⁸³ The amalgamation of connections between individuals and the interactions that operate via the connections allows for the possibility of social contagion and interpersonal influence.¹⁸⁴ Biblically speaking, people are called to build up one another through their connections (1 Thess. 5:11).

The Networked Church

Howard examines the role Christian community plays in sanctification. Church communities form part of one's Christian network. In order to explore the impact of community, Howard looks at the life of Paul. Paul's community was a key part of the progressive sanctification of individuals. Holiness requires the help of a community, and holy living has to take place in the context of relationship. Sanctification is a precursor for people to have an outreach focus.¹⁸⁵ What I say is included in man's *Imago Dei* mission. Howard notes that a redeemed community plays a key part in progressive sanctification in Pauline theology.¹⁸⁶ If one does not acknowledge the need and importance of community, one is left in a lonely place in one's development.¹⁸⁷ Progressive sanctification is the mechanism by which Christians become transformed into God's image and are enhanced in their ability to reflect God's glory to others.

¹⁸² Ibid., 21.

¹⁸³ Ibid., 161.

¹⁸⁴ Ibid., 16, 22, 105-112.

¹⁸⁵ James Howard, "Connected, Paul, the Community, and Progressive Sanctification" (PhD Diss., Dallas Theological Seminar, 2004), iv.

¹⁸⁶ Ibid., 2.

¹⁸⁷ Ibid., 3.

Transformation takes place, and Christ followers participate in community and follow God's commands. As the community follows God's instructions and reflects God's glory, the whole community grows together and influences the world for Christ.¹⁸⁸

Kuyper points out in his book *Rooted and Grounded* that the church combines both the qualities of an organism and an institution. He suggests that Scripture does not allow separation between the qualities of an organism and institution, since it intertwines them together. Mixing of organism and institutional elements shows up in various ways, like how a person sows and plants, or the image of healthy growth. Exceeding every other figure, the metaphor of the body is used in Scripture to describe the church. This image affirms organic life, a figure that bonds the parts together through an unseen power. It presents natural growth as taking place not via adding something, but through an external force that emanates as a result of what takes place inside one's heart. Our church network is rooted and grounded at its core.¹⁸⁹ Leveraging a power analogy, Kuyper states that the church empowers people to stand on the shoulders of those who came before them. One builds upon his or her foundation and stores up his or her crops for future generations.¹⁹⁰ There is a close relationship between the organism of the living church and the establishment that comes from it. The organism gives birth to the institution, but through the institution, the organism is nourished.¹⁹¹

Raine and Wellman examine social operating systems of networked individuals and share their thoughts on how to operate and thrive in a connected world. They frame their book not

¹⁸⁸ James Howard, "Connected, Paul, the Community, and Progressive Sanctification," 248.

¹⁸⁹ Abraham Kuyper, *Rooted & Grounded: The Church as Organism and Institution* (Grand Rapids, MI: Christian's Library Press, 2013), 5-7.

¹⁹⁰ Ibid.

¹⁹¹ Ibid.

necessarily about specific internet technology or applications, since to do so would date the material in a very short amount of time. They examine how information and communication technologies (ICTs) are used in a connected world, as networked individuals have the ability to project their voice in additional ways due to the existence of ICTs. In the current world, one operates in a network fashion. In social networks, the person is the focus, not family or the network, work unit, or neighborhood. The focus on self is seen by how one engages in various online social media sites, where people express what is happening with them, and others can read and respond.¹⁹² When operating in a network, an individual functions as an embedded member of a group and thus relies on permanent members of the group.¹⁹³

Contagion in a Small World

There have been scientific studies done to assess just how connected individuals are to one another. It turns out that everyone really does live in a small world. Within a few layers of a network, one can connect with just about anyone. Travers and Milgram experimented with the idea of the small world problem. The easiest way to understand the small world problem is examining what the probability that any two individuals, chosen at random from a large population, will know each other. As a result of social networks, the ability to connect to a broad set of individuals is easier than what one might imagine. Seeking to track down a specific individual from an arbitrary set of individuals found that on average they could connect to that individual with a mean number of intermediaries of 5.2 parties.¹⁹⁴ Within a connected network,

¹⁹² Lee Rainie and Barry Wellman, *Networked*, 6.

¹⁹³ *Ibid.*, 12.

¹⁹⁴ Jeffery Travers, and Stanley Milgram, "Sociometry, An Experimental Study of the Small World Problem," *Sociometry*, 32, no. 4 (Dec. 1969): 425-443.

one can pass on experiences in a variety of ways. Kramer, Guillory, and Hancock have explored how emotional contagion works. They performed experiments to understand how emotional states can be passed on through social networks. Using a Facebook group with 689,003 individuals, they were able to pass on emotional states via emotional contagion. This took place without direct interaction between individuals. The more emotionally involved individuals were, the more likely they would respond to posts.¹⁹⁵ This illustrates how within a network, people can influence one another, and innovation ideas get passed on, multiplying the impact on the network.

Characteristics of Our Ecosystem

Lowe and Lowe examine how Biblical theology and nature powerfully align to show people the ecology of living and thriving. Individuals are designed to live in a network, and one can trace how Christians grow by looking at the Biblical record, which is done in this section by looking at key innovation champions. Individuals are connected in an ecosystem. For example, Lowe considers how spiritual formation and Christian education can take place within online communities. They note how this works in a digitally connected world:

We have seen evidence in the church, classroom, and community that traditional approaches to spiritual formation are inadequate because they are too individualistic, private, and disconnected. Most of us no longer live in monasteries cloistered from the real world. All of us live, work, and relate to each other in the real world and this world is digital, networked, and highly interconnected. Given the twenty-first century reality of digital relationships and interactions, we need a model of spiritual formation that provides a better fit for the way we live in the interconnected age.¹⁹⁶

¹⁹⁵ Adam D. I. Kramer, Jamie E. Guillory, and Jeffrey T. Hancock, "Experimental Evidence of Massive Scale Emotional Contagion Through Social Networks," *Proceedings of the National Academy of Sciences of the United States of America* 111, no. 24 (2014): 8788-8790.

¹⁹⁶ Stephen and Mary Lowe, *Ecologies of Faith in a Digital Age: Spiritual Growth through Online Education*, 4.

There are various types of ecologies: (1) cosmic ecology, (2) earth ecology, (3) social ecology, (4) human ecology, (5) personal ecology, and (6) garden ecology. Each of these ecologies provides information about God's design and intent for people to be connected. Layer upon layer, they all are in harmony. Individuals are meant to be part of a garden-inspired ecosystem. When one operates in this fashion, one gets the spiritual and social nutrients one needs, and as a community, people can build one another up.¹⁹⁷

Unfortunately, everyone has the problem of sin. Just like the healthy nutrients of Christ can pass through a network, so can sin and death.

As a result of their research on the ecological motif found in Scripture and nature, Lowe and Lowe make the following eight propositions:

- Proposition 1: God created a universe that exists and functions as a cosmic ecosystem.
- Proposition 2: The earth exists in a larger cosmic ecology and operates by ecological laws.
- Proposition 3: Natural growth follows ecological laws and teaches us that everything grows through ecological interconnections and organic interactions in a mutualistic relationship of interdependence.
- Proposition 4: Ecological laws that govern natural growth operate similarly in the spiritual realm.
- Proposition 5: Christians have a spiritual connection to Christ and other Christians, which forms a spiritual ecology.
- Proposition 6: The spiritual connections one has with other Christians create opportunities for reciprocal exchanges of spiritual nutrients.
- Proposition 7: The spiritual ecology created by Christ through the Spirit is unbounded by time and space, enabling Christians to enjoy the benefits of this reality at any time and in any place, whether in person or online.
- Proposition 8: Christians who share a connection to Christ through the Spirit receive an imputed holiness that makes them mutually contagious and provides us with the ability to spread our contagion in online ecologies of learning.¹⁹⁸

It is clear from Jesus' teaching that an ecosystem provides a valid framework for life in

¹⁹⁷ Stephen and Mary Lowe, *Ecologies of Faith in a Digital Age: Spiritual Growth through Online Education*, 11-22.

¹⁹⁸ *Ibid.*, 211-222.

Christ, where, connected in a community, human beings form one organism doing the will of God. Lowe and Lowe note that in this system, each member is nurtured and built up:

God's word reveals an ecological motif that shows how natural growth illustrates spiritual growth manifested in the numerous references to trees, flowers, seeds, plants, vineyards, forests, and fields. Jesus taught the multitudes and his disciples using parables that consistently direct attention to various kinds of natural growth to help us understand growth in the church and kingdom. The apostle Paul employed the ecology of the human body and the interconnectedness of its various members to illustrate the inner workings of the body of Christ that makes possible its extensive and intensive growth.¹⁹⁹

It is important to view spiritual formation with this ecological perspective of the world. In the digital world, much of one's network does not require individuals to be physically near, but can be shared online to large groups. Thus, there is the potential to network with a variety of like-minded individuals. Even though this distance exists, one still can form community.

UNIT 5: Assessment of Innovation Champions

This assessment section draws together the information from the Old Testament, New Testament, and early church to compare the twenty-three innovation champions. The history, social network, and spiritual formation assessment results are summarized in three tables. This survey looks at individuals who had powerful encounters with God and had to endure difficult situations. Even in the midst of these challenging circumstances, they brought God into their situations and called out to Him for help. Everyone is different, and God rejoices in how individuals are each fearfully and wonderfully made. Yet, God wants people to move in the direction of redemption, to be called back to a taste of Eden, where one could walk freely with God. Having a data set of twenty-three individuals spanning over several millennia helps to give a sampling from a variety of cultural, political, relational, and spiritual vantage points. In each

¹⁹⁹ Ibid., 227.

case, the twenty-three innovation champions point to the same God with the same intentions.

Networks of the Champions

Table 3 below summarizes the spiritual social network efforts of the twenty-three champions who are discussed in this section. The table shows colors and values indicating the types of spiritual social networks and spiritual formation influences they had. Green means high; i.e., there is plenty of material showing this was a significant part of the champion's spiritual social network or spiritual formation. For the God category, green means they had some form of direct contact with God. Yellow means that there is a moderate amount of correlation in this area for the champion. The God category indicates whether they had communication with someone who had some form of direction contact with God. No color or value means that the Biblical text (or early church writings) does not address this area enough to provide a meaningful assessment.

Table 3. Spiritual Social Network Summary of Innovation Champions

	Champion	God	Mentor	Elders Teachers	Ministry Colleagues	Disciples
1	Adam	high	high			
2	Noah	high				
3	Abraham	high				
4	Isaac	high				
5	Jacob	high				
6	Joseph	medium				
7	Moses	high		high	high	
8	David	medium			high	
9	Jonathan	medium			high	
10	Jeremiah	high			high	high
11	Daniel	medium			high	
12	Jesus	high	high	high	high	high
13	John	high			high	high
14	Peter	high			high	
15	Paul	high			high	high
16	James, Brother of Jesus	high		high	high	
17	Luke	medium	high	high	high	
18	John Mark	medium	high	high	high	
19	Matthew	high			high	high
20	Thomas	high			high	
21	Timothy	medium	high	high	high	
22	Titus	medium	high	high	high	
23	Polycarp	medium	high	high	high	high

Each had a meaningful connection with God and understood their *Imago Dei* calling. From the limited historical narrative, most had close ministry colleagues in their network. All had a written record that allows for timeless influence beyond their immediate network. For the God column, "medium" means indirect contact with God via dreams, and "high" means a direct dialogue of some sort with God..

Transformation Through Community and Spiritual Social Networks

As indicated by this chart, spiritual legacies are transferred to an individual by a mentor who comes along with the Spirit of God. The impact of each innovation champion is multigenerational in a spiritual sense. Individuals are influenced by those who influence mentors. Transformation is developed in relationship. The early church focused strongly on family and community. In their communities, oral tradition was common and formed a well-known medium for entertainment and sharing important historical stories. The practice or sharing the oral tradition was a part of mentoring and discipleship. The disciples of the apostles diligently passed on the things they learned, and spiritual formation and character were developed around them. In

the midst of their community, they formed their spiritual network. Just as they were formed by Christ, the apostles would pass along the rich tradition of life in Christ they received. Their message would include how they had internalized Christ's truth in community in their spiritual formation. Sharing their story would include using their personalities and the formative events in their life circumstances.²⁰⁰ Jesus' apostles preached the Gospel, they mentored new believers, they did on-the-job training with individuals, they helped establish churches, they went to unchurched areas and brought the good news, and they continued to practice the spiritual disciplines they were taught.

In the early church, a key element in all of these behaviors was a focus on community. One did not accomplish these things alone. Families, villages, friends—everyone was connected. Moreover, Jesus spent three years living and ministering with His disciples. This was a close time of growth, teaching, mentoring, and planting the seeds that would transform each one of those individuals. Then Jesus died and rose again; the disciples saw the risen Christ, and they saw Him do what he said He would do. Finally, the Holy Spirit filled them, and they had the spiritual strength to do what would otherwise be impossible. Once the disciples received the message of the gospel in its community and relational context, they were committed to passing it on. The establishment of a strong oral tradition paired with working together in community helped ensure Christ's message was passed on, and passed on accurately. Eventually, works of Christ and the apostles were written down, and the key messages and application of the messages was codified in the canon as it is known today. Today, one can have that same transformational experience. I would argue individuals are spiritually, emotionally, and physically changed. When engaged in the right spiritual disciplines and the right acts of service, individuals are fully

²⁰⁰ Joe Hellerman, *When the Church Was a Family* (Nashville: B&H Publishing Group, 2009), 12-16.

engaged in the works of Christ and doing what He has called them to. Human beings can become the people they were meant to be.

Impact of Champions in Passing on God's Message

In terms of social network theory, there is usually a champion, or a cadre of champions, that intentionally influence their network with the goal of promoting an idea they strongly desire to communicate broadly. One sees this evidenced in each group that is examined in this section. Rogers develops this idea, arguing how, via diffusion, there is a flow from innovation to communication, the passage of time, and the engagement of this innovation among members of a social system. Although Rogers' work examines aspects of the business world and the impact of technological innovation, it has a broader application and can be seen as a mechanism to capture what is accomplished by people of faith throughout the Bible.²⁰¹

Summary of History, Social Network, and Spiritual Formation Factors

From the Old Testament, one has a large time span with very distinct cultures and situations. Seven temporal and cultural situations were surveyed in this dissertation: (1) creation, (2) the flood, (3) the patriarchs, (4) the seeds of a nation, (5) the unified kingdom, (6) the end of the divided kingdom, and (7) the exile. From the New Testament, all of the assessed individuals died as martyrs. Their spiritual formation and the work of the Holy Spirit prepared them for this ultimate sacrifice. By simply recanting their faith, they could have saved their lives, but they could not break from their first love in Christ. By utilizing Scripture, New Testament apocryphal writings, and the historical writing of Eusebius and others, one can construct enough information to gain insight into the chosen individuals' spiritual formation and the intervention of the Holy

²⁰¹ Everett Rogers, *Diffusion of Innovation* (New York: Free Press, 5th Edition, 2003), 11.

Spirit. There is evidence that the apostles worked together on a coordinated plan to evangelize all nations, fulfilling what they were called to do in Christ. The apostles decided by lots to determine where they individually should go.²⁰² They knew the champions of the faith from the Old Testament, as powerfully captured in Hebrews 11. They read Scripture on their own and read it out loud in their communities. They sought how to engage their cultures as innovation champions with Christ's message of repentance and redemption. The proof of the Holy Spirit's work in ages past can build one's hope and trust in the present. The martyred individuals in the early church planted the seeds for institutionalizing the church and nurturing church communities. The early church tried to establish church plants and make them vibrant places to evangelize and grow believers in their faith. They were faced with pagan communities and cultures that did not want them to succeed. Even though they worked in love (*agape*), they were not always met with a warm reception. The goal of these church plants was partly to place leaders in churches in a growing number of evangelized communities. Church leaders included Titus in Crete, Timothy in Ephesus, and Polycarp in Smyrna. They needed proper training and empowerment by the Holy Spirit to do their work.

For comparison, the following three tables summarize the history sketches, spiritual social networks, and spiritual formation findings for the twenty-three individuals considered in this section. Table 4 and Table 5 show a summary of the history sketches. Within the historical synopsis of these individuals, there is a thread showing them being used by God as part of a larger Divine plan. Within the story highlights, one sees their personalities in action. Each person's life tells a story.

²⁰² Socrates Scholasticus, "Ecclesiastical History," In *Ante-Nicene Fathers Volume 2*, Edited by Phillip Schaff. (Grand Rapids, MI: Christian Classics Ethereal Library, 2009), 71.

Table 4. Old Testament History Sketches

	Synopsis	Examples of Story Highlights	Temporal Development
Adam	“First Adam.” Was told about creation by God. He also was introduced to creation by a personal tour directly from God.	Adam was made in the image of God and started in the desired human state.	Pre to post fall, lived 930 years, first to experience aging
Noah	Last faithful family before the flood. Knew pre-flood and post-flood worlds and could pass on the work of God history to others. May have struggled with alcohol (Gen 9:20-28)	Was obedient and built the ark, even though others thought it was nonsensical	Walked with God pre to post flood. By living 950 years could invest into many generations, including Abraham.
Abraham	Blessed to be a blessing, given a son of promise	Left land to follow God, liar	Abram to Abraham. Base on God's covenant with him
Isaac	Promised son of Abraham, sends Jacob to Laban, lived in Gerar (Abimelech) and Valley of Gerar afterwards	Loved wife, lied to Abimelech out of fear. Later had a covenant with Abimelech	Abrahamic covenant revealed to him personally
Jacob	Son of promised line, shepherd, seed of Israel. Prosperous. Covenant with Laban. Settles in Bethel. Formation of 12 Tribes.	Deception, stolen blessing, faithful in his was as with Laban	Became the father of a nation and God changes his name from Jacob to Israel
Joseph	Interprets dreams, ruler of Egypt, born leader	Oversees Egypt's drought	Son, slave, ruler. What you meant for evil God meant for good
Moses	Burning bush. Face shines with God's glory, stutter	God revealed as Yahweh. Judge, prophet, and ruler	Prince, exile, prophet
David	Youngest son. Made king. A man after God's own heart	King, poet, musician	Shepherd, son, servant to the king, king, sinner, repentant
Jonathan	King's Son, heir to the throne.	Faithful friend of David	Changed by relationship with David
Jeremiah	Prophet during Josiah, Jehoiakin, Zedekiah. Visions and messages from God	Consecrated to be a prophet, weeping prophet, before birth God knew him	Stayed firm to God but saw Judah's fall
Daniel	Babylon saw God's Spirit and leadership qualities in him. Elevated to third in command.	God repeatedly perseveres Daniel and serves under two kings	Free Israeli youth, slave, to governor over Babylon - all faithful to God

Table 5. New Testament and Early Church History Sketches

	Synopsis	Examples of Story Highlights	Temporal Development
Jesus	The promised Messiah. Died and rose again. Ministered to the sick and sinners, those needing and wanting His help.	The only God-man. Brought God's love (<i>agape</i>) and direction to the world and was killed for it.	Faithfully fulfilled His Father's salvation plans, including humiliation and crucifixion.
John	Beloved disciple, time at Patmos, church leader. Martyred for Christ. Died in Ephesus.	Time to think of deeper meanings of the Logos. Deep emotional intelligence	Transformed from fisherman to apostle
Peter	Active in faith, denied Christ, but strongly redeemed himself in ministry. Martyred for Christ, crucified upside down in Rome.	Boldly acting on faith like walking with Jesus on water. Was the "rock" Jesus could make the church out of	Transformed from fisherman to apostle
Paul	First Christian missionary to the Gentiles. Effective writer and minister to early church. Martyred for Christ in Rome	Bond servant for Christ. Effective missionary and trainer of leaders. Able to contextualize Gospel.	Transformed from Jewish Saul to Christian Paul
James, Brother of Jesus	Bishop of Jerusalem. Martyred for Christ	Harness the tongue. Prayer of faithful accomplishes much	James, the eldest younger brother of Jesus to "James the Just"
Luke	Physician (Col 4:14). Involved with Paul's ministry (2 Tim 4:11). Likely one of 70 (72) disciples sent out to preach (Luke 10).	Preached to the Gentiles from Jerusalem to Illycium (Eusebius 3.4.1)	Became a Christian, did missionary work, and wrote a gospel
John Mark	Leader of parish in Alexandria (Eusebius 2.24.1) Martyred for Christ	Ministry partner of Peter. Interpreter of Peter (Eusebius 3.39.15)	Became a Christian and wrote a gospel
Matthew	Tax collector to fisher of men. Martyred for Christ	Missionary to Ethiopia (Ecc. History of Socrates 1.19)	Transformed from tax collector to apostle
Thomas	Missionary to Parthia and India. Martyred for Christ. Buried in Edessa (Eusebius 3.1.1). His legacy started the school of Thomas. Strong eastern oral tradition, only written down later.	Overcame doubt. Frequently appears in apocryphal texts. Missionary in India. May have been influenced by Gnosticism. (Acts of Thomas)	Went from Doubting Thomas, to a spirit filled apostle, to a missionary in an eastern culture, contextualizing to their ways.
Timothy	First bishop of Ephesus church. Martyred for Christ (Eusebius 3.4.6)	Had a joint heritage with a Greek father and Jewish mother	Transformed from believer to bishop
Titus	First bishop of (Gortyna) Crete. Martyred for Christ (Eusebius 3.4.6)	Ordained by the apostles. Preached with Paul and suffered persecution	Transformed from became a believer as an adult
Polycarp	Bishop of Smyrna, defender against Gnosticism, Martyred for Christ in Smyrna	With Titus, Timothy, & Erastus delivered 2 Cor. to Corinth (Acts of Titus). Wrote letters to churches of Ephesus, Philippians, Rome, Magnesia, Tralles (Eusebius 3.36.5-8)	Transformed from believer to bishop

Table 6 and Table 7 highlight each individual's activity in his spiritual social networks.

From a spiritual network point of view, each of these individuals operated in a community,

which would at minimum be their family. They had a mentor (for some this was God Himself), they had individuals they invested in, and they had a support community and family to rely upon. No one could do his mission on his own. Additionally, each individual was influenced by his teachers and co-laborers (along with the influence from multiple generations of the mentors of mentors), his spiritual community, and being active in the process of giving the message away. Thus, for each of the champions, there is an imperative (from a range of divinely appointed motivations) that one must be a good steward of his or her gifts and diligently pass them on to others.

Table 6. Old Testament Spiritual Social Networks

	Mentor(s)	Disciples	Support: Family and Community
Adam	God	Long life transference, multi-generations.	Eve, Cain, Able, Seth. Extended family for nearly a millennium. Would have been the ultimate elder of this first community.
Noah	God, Enosh, living ancestors	Long life transference, multi-generations	His wife, Shem, Ham, and Japheth. Before the fall Enosh, Kenan, and Mahalalel (descendants of Adam). After the flood, his family (all of man that was left)
Abraham	God, Terah, Noah, living ancestors	Isaac, Ismael, others	Sarah, Isaac, Ishmael. Extended family and servants. Those in Palestine seeing him as a might prince.
Isaac	Abraham, God	Twins: Jacob, Esau	Rebekah. Abe's, Laban's, and his family and servants
Jacob	Rebekah, Isaac, God	His twelve sons	Rachel, Leah. The community of Laban. The community back in Palestine with Esau and the local inhabitants.
Joseph	God via dreams, visions	Manasseh, Ephraim	Children, then his parents again. Those he influenced in his Egyptian positions of authority.
Moses	God, Jethro	Levites, appointed leaders	Zipporah. Nation of Israel, appointed leaders. 70 elders
David	God via prophets, Holy Spirit	Influence Israel as a whole	His wives and children. Jonathan early in life. Individuals like Joab. The prophets and priests.
Jonathan	Family influences	Children, nation of Israel	Wife. David, Jewish leadership. His family.
Jeremiah	God	Prophets	Priests who were with him in Anathoth in Benjamin. Fellow prophets.
Daniel	God	Influenced many by his character	Shadrach, Meshach, and Abednego. Ministered to the kings of Babylon. Supported exiled Jews and peers.

Table 7. New Testament and Early Church Spiritual Social Networks

	Mentor(s)	Disciples	Support: Family and Community
Jesus	God the Father	Apostles and other followers	Father and Holy Spirit. Seekers and believers. The disciples He was close to. 70 (72) disciples. His family.
John	Jesus	Polycarp, Luke, Paul	Peter, James. Church community
Peter	Jesus	Mark, Paul	James, John, Andrew. Papias. Mostly Jewish Christian communities. Succeeded by Papias (Eusebius 3.36.2)
Paul	Jesus, along with Peter, James, and John	Timothy, Titus, Luke, and many others	Wife when practicing Judaism. Many church communities he started
James, Brother of Jesus	Jesus	Individuals from his Jerusalem church	Jesus, Jude. Church in Jerusalem. His family.
Luke	Paul	Individuals from his support network	The apostles. Barnabas, John Mark, Silas, Timothy, Aquila and Priscilla, Erastus, Gaius of Macedonia, Aristarchus, Sopater, Secundus, Gaius of Derbe, Tychichus, Trophimus (Eusebius 3.4.6 note)
John Mark	Peter	Individuals from his support network	Peter, John, Luke, Annianus (Alexandria parish successor Eusebius 2.24.1). Papias
Matthew	Jesus	Individuals from his support network	Church in Ethiopia
Thomas	Jesus	Individuals from his church in Parthia and India	Thaddeus (Eusebius 1.8.3). Abbanes (Acts of Thomas 1). Individuals from his missionary churches.
Timothy	Paul	Individuals from his church in Ephesus	Ephesus church, and individuals like Luke
Titus	Paul	Members in the church at Crete	Looked after his sister. Crete church, in Jerusalem and then back in Crete
Polycarp	John	Irenaeus. Those in his church in Smyrna	A friend of the apostles (Eusebius 4.15.3), church of Smyrna

Table 8 and Table 9 show a summary of three spiritual formation components from Dallas Willard for each listed individual. In the Old Testament, many of these individuals experienced God directly communicating with them. In a sense, God was acting as at least one of their mentors. Of course, before Eve, the only person Adam would have known was God. So, among other things, God acted as his mentor. In spiritual formation, there is always direct access to God. Historically, the spiritual disciplines were revealed with greater clarity over time as more individuals engaged with God and God unfolded history of salvation one step at a time. When Jesus came to earth, there was a similar but much more intense development of an understanding of a living faith. Starting in the New Testament and the early church, there was an abundance of

guidance to help individuals develop a rich set of spiritual disciplines.

Shaping one's spirit requires work. Developing one's spirituality has to be a Christian-based effort in obedience to what Christ has instructed. God had to help Adam shape his spirit in a fallen world; his work, his relationships, and his fellowship with God all changed. In the Old Testament, calling on the name of the Lord was key in the start of individuals coming to faith in God, as Enosh's generation first modeled. Practicing and then writing methods to shape one's spirit were recorded, as they also were in the New Testament. Being transformed by the Holy Spirit is a blessing. God takes what is shaped in our hearts and brings it to life, as He uses us according to our own unique talents, personality, background, and shortcomings. In the early church, one sees the development of community in Christian circles. Together, Christian communities rejoice in the teachings of the apostles and seek to help each other mature.

Table 8. Spiritual Formation – Old Testament

	Spiritual Training	Shaping the Spirit	Transformed by Holy Spirit
Adam	Taught and walked freely with God. Had perfect fellowship with Him and got spiritual nourishment directly from God.	God taught him some basics for shaping his fallen spirit. With his grandson Enosh (Gen 4:26) man began calling on the name of the Lord.	Walked with God, but via the Fall broke the relationship and had to depend on God in a new brokenness
Noah	Built altar to the Lord. Stayed faithful to what he knows the Lord wanted.	Found favor with God when all else went astray (Gen 6).	Spoke with God. Knew the grandson of Adam, Enosh.
Abraham	Called out by God. Was introduced to new spiritual truth directly from God.	Had his faith stretched several times. Obeyed. circumcise, sacrifice Isaac	Could have met Noah and learned of calling on God as first came about in Enosh's generation. Received direction from God
Isaac	Followed what he was thought by his father. Built altar to the Lord	Knew he was the son of promise. Trusted father and God	God appears to him. Abrahamic promise confirmed. Received direction from God.
Jacob	Prayed to the God of Abraham and Isaac. Deliver from Esau.	Had dreams, like Jacob's ladder, reminding him of his involvement in God's plan	Wrestles with angel, by which God showed Jacob who is in control by overpowering him
Joseph	Followed law, would not sleep with Potiphar's wife	Receives dreams from God. Forgives brothers. What you meant for evil God meant for good (Gen 50:20).	In tune with God, and worked with the Holy Spirit to interpret dreams and to lead Biblically
Moses	Prayer, worship, sacrifices, dialogues with God	Internalized fellowship with God. Wrote the Pentateuch.	Trust based relationship with God. Able to do many miracles. Received the Ten Commandments.
David	Prayer, worship. David poured out his heart to God	Wrote many psalms, music about hardships and calling to God. Sought the Lord's guidance	God's anointed king by Samuel. Used by God to establish Israel as a Godly nation. Filled with the Holy Spirit.
Jonathan	Faithful in Jewish practices.	Had trust and confidence in the Lord, even in battle	God worked with him and gave him success, even in battle
Jeremiah	Theologian who embraced and taught truths from Torah. Cried out to God.	Was obedient to God in his prophetic office, shaping himself as God wanted	God put His words in his mouth. Plus, he knew his heritage: I knew you before you were born. (Jerm 1)
Daniel	Kept his spiritual disciplines, like praying towards Jerusalem, kept kosher	Set his mind to serve the Lord even in a pagan land. He would not compromise.	Received dreams and visions from God and could interpret them.

Table 9. Spiritual Formation – New Testament and Early Church

	Spiritual Training	Shaping the Spirit	Transformed by Holy Spirit
Jesus	Pray all night to the Father, fasting, knowledge of Scriptures, fellowship	Cultivated a lifestyle that kept him closely aligned with the Father	Worked in step with the Holy Spirit. Endured great suffering while delivering his message of love and salvation with the support of His Father.
John	Did what Jesus taught him, prayer, and read Scripture	Followed what Jesus instructed, even after He was gone	Lived with Jesus. Did miracles. Received Apocalyptic visions
Peter	Did what Jesus taught him, prayer, and read Scripture	Moved Christ as the center, and not Jewish things	Lived with Jesus 3 years, did miracles, power preaching
Paul	Did what Jesus, the apostles, and his Jewish training taught him	Leveraged his Jewish "PhD" training to keep shaping himself. Had to deal with his thorn in the flesh never being healed.	At just the right time he was knocked off horse by God and turned to the right direction. Had a spirit filled life of faith, did miracles
James, Brother of Jesus	Did what Jesus taught him, prayer, and read Scripture	Faithful to Jewish traditions prior to Jesus' ministry	Witnessed the risen Christ and was transformed
Luke	Did what Paul and the apostles taught him, prayer, and read Scripture	Knowledgeable of the word to preach with Paul	Was actively involved with Paul and would have experienced similar things to him
John Mark	Did what Peter and the other disciples taught him, prayer, and read Scripture	Knowledgeable of the word to preach with Peter	Was actively involved with Peter and would have experienced similar things to him
Matthew	Did what Jesus taught him, prayer, and read Scripture	A Levite who was knowledgeable about the law	Transformed from living with Jesus 3 years and being filled by the Holy Spirit. Was divinely inspired to write his gospel.
Thomas	Did what Jesus taught him, prayer, and read Scripture	Worked hard to build his faith	Transformed from living with Jesus 3 years and being filled by the Holy Spirit.
Timothy	Did what Paul and the apostles taught him, prayer, and read Scripture	Worked hard in his youthfully to be shaped as a man of God	Was actively involved with Paul and would have experienced similar things to him
Titus	Did what Paul and the apostles taught him, prayer, and read Scripture	He was ardent and zealous in the spirit (Acts of Titus)	Tradition says he saw the risen Christ. Was actively involved with Paul and would have experienced similar things to him
Polycarp	Did what John and the other apostles taught him, prayer, and read Scripture	He was a trustworthy witness of Christ (Eusebius 4.14.5)	Was actively involved with John (and other apostles) and would have experienced similar things to him

UNIT 6: Conclusions from Spiritual Social Networking

Summary Implications from Evaluated Innovation Champions

God does not change through the ages. His direction to mankind has been the same:

Come to Me. The historical sketches in the section show how God transcends culture and time.

He can speak into each personal situations and help one make the best out of them when one invites God into them. A supportive network is important for everyone to be well-grounded in faith in Christ and the teachings of Christianity. There should be a spiritual lineage from which one learns and grows from those before him or her, and one should pass on to others what he or she learns. One needs a network of supportive people in life. Often, this network can be found in a church community. In terms of spiritual formation, most of the individuals examined in this dissertation were actively involved in leadership and ministry, which requires that they be in shape spiritually and able to communicate the truths of the faith. They were doing what they were called to do. They were transformed in the process of being used as channels of the Holy Spirit

God directly intervenes in people's lives, whether it be through Scripture, prayer, fellowship, or other Divine encounters. Per the surveyed innovation champions, God's intervention was a powerful motivator for them to act on their *Imago Dei* mission. Seeing the risen Christ was especially significant. One has the testimony of eyewitnesses of the resurrection from reliable sources, and in an almost first person sense, one can know the risen Christ and all of the vital experiences in community of the Living Word in order to invigorate a healthy spiritual life. This analysis could help quantify further what characteristics are found in significantly used Biblical individuals.

In Scripture, one sees how individuals are part of a network in an ecosystem, and looking around us, one sees other manifestations of the ecologies God made. Individuals are created to be connected. One has the ability to build up those around him or her, as positive influence can be passed along through his or her connections. The innovation champions discussed in this section illustrated this concept in action.

Impact of Spiritual Social Network for Innovation Champions

People are created to be part of an ecology of faith, growing and thriving in a spiritual ecosystem. Within man's *Imago Dei* mission, one does not go about life alone, but everyone acts as innovation champions working together to fulfill their corporate missional calling. This dissertation looked at the lives of twenty-three biblical and early church innovation champions that illustrate how action in man's *Imago Dei* mission works. From the literature review, one sees the impact of supportive spiritual groups on individuals and the spiritual awakenings that come from them. For example, Hagen found that religiosity is a protective factor in reducing the number of bad and addictive behaviors. Jankowski shows that religiosity can provide a protecting influence on adolescent hazardous alcohol use. Matthews states that being part of religious groups delivers greater health benefits than secular ones. Galanter found that there is redemptive value to participants in mutually supportive communities. Galanter also found that Alcoholic Anonymous members experience a spiritual awakening similar to what took place in the Great Awakenings.

The survey showed how each of the evaluated innovation champions developed his faith in the midst of the life and ministry he was called to. They all experienced God's redeeming work in their lives, helping them to overcome sin, to be empowered to do their calling, and to be fortified biologically in their times of need. For example, one has plenty of information about the life of Paul to observe samples of his biological redemptive responses. While ministering on a missionary journey in Malta, Paul was bitten by a poisonous viper but experienced no ill effect (Acts 28:1-6). Paul many times was beaten, lashed, and stoned, being left for dead, but survived each encounter (2 Cor. 11:23-28). Paul personally experienced and wrote about how his outer man wasted away while his inner man was renewed daily (2 Cor. 4:16). He encountered spiritual

redemption and biological redemption, including miracles. Keener documents numerous divine miracles that have taken place by the acts of God. All of these encounters include a biological component dispensed within the supportive intervention of a community.

Thus, from a spiritual social network point of view, one can conclude that community transforms people and imprints an enduring spiritual impression in spiritual and character formation. Even when separated from the influence of the network, the imprinting from the community remains, but over time, it will need to be refreshed. For the case of substance abuse, community helps individuals to recover from, and reduce the temptation by, addictive behaviors. Spiritual awakening takes place in community and results in a personal, spiritually and emotionally charged experience that responds to and remembers the positive environment that exists. Like Galanter claims, there is a biological component from faith support communities. In the case of substance abuse, addictive cravings can decrease through spiritual formation and engagement in community. Certain tools are available to change behavior and internalize spiritual and community support. Everyone can act as an innovation champion in their community ecosystem, contributing their portion of the *Imago Dei* mission directive with their talents.

PART 3: Redemptive Evidence at a Molecular Biological Level

Introduction

In order to carefully examine a specific aspect of biological creation, it will be necessary to address some technical areas of molecular biology, genetics, and epigenetics. This section focuses on a specific example of creation at a molecular level. This section's assessment explores scientific data about alcohol metabolism to see how it may illustrate ways in which God's redemption correlates with our understanding of molecular biology. Since individuals are

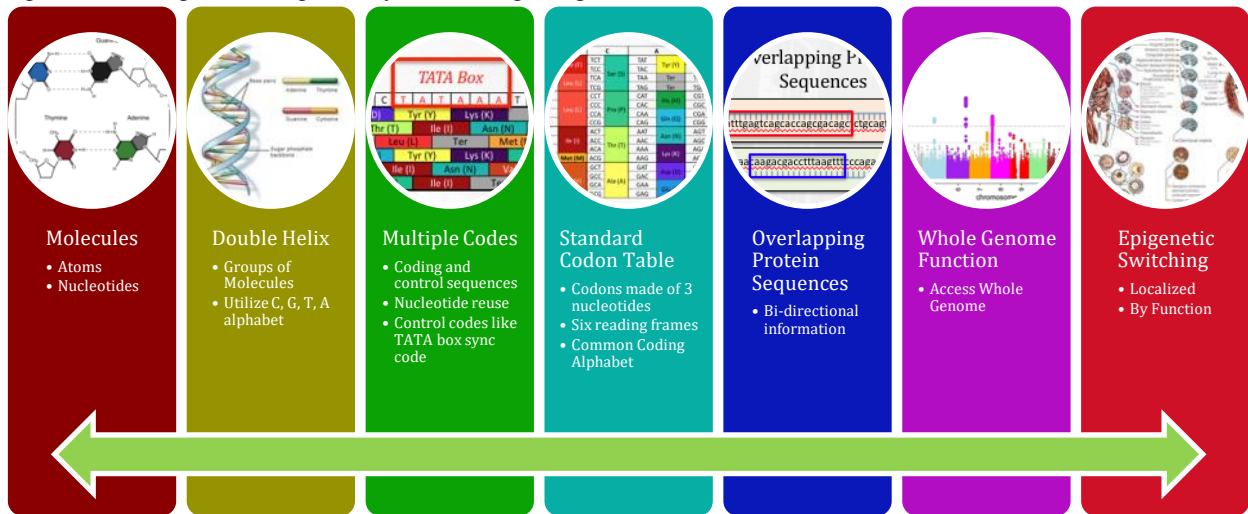
designed according to the *Imago Dei*, individuals reflect the attributes of God, such as their communal nature. Human biology is designed by God to fit within creation and the ecosystem of earth.

Figure 10 shows multiple layers of design and functionality. All of these levels of design work together in harmony, where each level depends on the other layers in a finely tuned interdependent manner. Even more layers could be discussed, but what is shown below is enough to make this point, and provides motivation for the material that is covered in the assessment. My claim is that there is linkage between a theology of creation, our purpose of living within a spiritual networked “ecology” and community, and our genetic and epigenetic design. This will be elaborated in PART 4: Synthesis after the molecular biological assessment is complete, focusing on redemptive elements found in biology.

Thus, in Figure 10 there is a way of viewing layers of interdependent biological complexity by grouping different functions into layers that show how one builds upon another. All of the elements have to work for the overall biological system to operate normally. Each system is designed to relate to other systems and function together as a single unit. Moving from left to right in the figure each layer will be described noting how it fits into the other layers. First, molecules are combinations of atoms. In molecular biology molecules called nucleotides are used. These form the alphabet for the coding instructions that are linked together and captured in an organism’s deoxyribonucleic acid (DNA). Second, this information is assembled in an elegant way in the double helix. For the most part, every biological organism has DNA (outside of RNA virus organisms). Third, there the various codes and types of information that are found in DNA. Genes are organized with a start and stop region in DNA with intergenic spacers between them. Gene products like RNA contain the needed information to manufacture proteins. The genome is

universal, but also adaptive to some levels of change. Consider how this plays out in terms of information processing. There are multiple types of information that nucleotides are used for, including synchronization codes while reading a DNA strand, indicating that specific coding information is coming (like a TATA box sequence). The synchronization code is one of the first steps used in transcription (the process of copying and using DNA information to make cell products like proteins) initiation. This is a signal for RNA to read from the DNA the information that will be coded (like a protein). An interesting factor of DNA is that its coding information is configured into triple nucleotide groupings that are called codons. Fourth, there is redundancy in the mapping of codons into a translation matrix that is called the *standard codon table*. Almost all life uses this same translation table. There are six possible reading frames where each would lead to different codons being decoded. Due to the nature of the double helix, there are two complimentary strands in the DNA. Fifth, information can be read in both directions (and at the same time). This provides a huge increase in complexity. Unique coding information is included in both directions. Thus, there are overlapping proteins found in both directions using the same nucleotides. Sixth, at a higher level of functionality, one can look at the whole genome in an aggregate fashion. Using a number of key markers, one can map aspects of the unique features of a population to a specific unique feature (phenotype). This has been useful in gaining knowledge in disease pathology and considering where to target therapy by understanding some of the genetic factors for its cause. Finally, seventh, there is the epigenetic level, where, based on environmental adaptation, genetic functions can be turned on, off, or modified. There is no change to the underlying genetics, but function is modified. Some of these changes can be passed on from generation to generation.

Figure 10. Seeing the Biological Layers of Design Together



UNIT 1: Genetic and Epigenetic Alcohol Metabolism Findings

In order to focus the scope of this dissertation to a specific area, the assessment will be limited to one molecular biological area. The focus will be alcohol metabolism, examining a key enzyme that is part of a gene-rich region in human Chromosome 4, called alcohol dehydrogenase (ADH). Within this ADH region, there is a key alcohol metabolism gene, ADH1B, with its three variants ADH1B*1, ADH1B*2, and ADH1B*3. Each variant correlates with a unique way individuals metabolize alcohol. ADH1B*1 is the most common and its epigenetic adaptation will be looked at.

Chemical Process of Alcohol Breakdown

Alcohol metabolism research has been ongoing for quite some time. A key resource examining this is the research sponsored by the US Department of Health and Human Services, National Institute of Health (NIH), via the National Institute on Alcohol Abuse and Alcoholism (NIAAA). NIAAA seeks to inform the general population that there are risk factors for heavy

drinkers including alcoholism, liver damage, and various cancers. As genetic- and epigenetic-based research develops, it has shown that some people are at greater risk than others.

What is the chemical process for alcohol breakdown? The chemical breakdown of the complex alcohol molecule is a multi-step process. Ethanol ($\text{CH}_3\text{CH}_2\text{OH}$), the chemical name for alcohol, is broken down with the assistance of enzymes. This mechanism breaks down (or metabolizes) the molecules into other compounds that can be more easily processed by the body. This multi-step procedure requires breaking down compounds into intermediate compounds that can have harmful effects on the body. Most of the ethanol is broken down in the liver by an enzyme called *alcohol dehydrogenase* (ADH), transforming ethanol into a toxic compound called *acetaldehyde* (CH_3CHO), a known carcinogen. In a second step, this is quickly broken down into a less toxic compound called *acetate* (CH_3COO^-) by a different enzyme called *aldehyde dehydrogenase* (ALDH). As a final step, acetate is broken down into carbon dioxide and water, for the most part by tissue other than the liver.²⁰³ Carbon dioxide and water are readily available compounds that the body can acquire through much easier means, so from a body nutrition point of view, the chemical breakdown of ethanol does not serve a useful purpose.

Genetic Components

As mentioned above in the overview of the chemical process of alcohol breakdown, two enzymes that are key in alcohol metabolism are (1) alcohol dehydrogenase (ADH) and (2) aldehyde dehydrogenase (ALDH). Note that ALDH is mentioned just at a high level but is not examined in detail within the data analysis. These two enzymes are encoded by different genes. The main site of alcohol metabolism is the liver. Metabolism converts alcohol into acetaldehyde,

²⁰³ US Department of Health and Human Services, "Alcohol Metabolism: An Update," accessed April 13, 2019, <https://pubs.niaaa.nih.gov/publications/AA72/AA72.pdf>.

which is mediated (that is, catalyzed) by the ADH enzymes. Variants of these genes produce different alcohol metabolism results. Different ethnicities tend to favor certain variants (which are called alleles). The variant that an individual carries influences what happens as a result of his or her alcohol consumption along with his or her risk of alcoholism.²⁰⁴

Linkage evidence supports that genes on Chromosome 4q (the long arm of Chromosome 4) in the region of the ADH genes affect risk of alcoholism. Humans have seven ADH genes tightly clustered on Chromosome 4q22 in about 365 kb of nucleotides, namely (in the order they are transcribed on Chromosome 4) ADH7, ADH1C, ADH1B, ADH1A, ADH6, ADH4, and ADH5, running from the qter (another name for the long arm of a chromosome) toward the centromere (the center of the chromosome), as shown in Figure 11, Edenberg et al. genotyped 110 SNPs across these seven ADH genes. There is evidence that variation in ADH1A and ADH1B plays a role in alcoholism risk. Edenberg notes that “[t]he primary pathway of ethanol metabolism involves oxidation to acetaldehyde, catalyzed by alcohol dehydrogenases (ADHs), followed by further oxidation to acetate, catalyzed by aldehyde dehydrogenases (ALDHs).”²⁰⁵

Several highlights for this area are listed below in Table 10:²⁰⁶

²⁰⁴ Howard Edenberg, “The Genetics of Alcohol Metabolism, Role of Alcohol Dehydrogenase and Aldehyde Dehydrogenase Variants,” *Alcohol Research and Health* 30, no. 1 (2007).

²⁰⁵ Howard Edenberg, et al., “Association of alcohol dehydrogenase genes with alcohol dependence: a comprehensive analysis,” *Human Molecular Genetics* 15, no. 9 (2006): 1539-1549.

²⁰⁶ Feng Zhou and Stephen Mason, “Genetic and Epigenetics of Fetal Alcohol Spectrum,” *Frontiers in Genetics*, June 2015.

Table 10. Alcohol Metabolism Components in the Chromosome 4 ADH Region

Ethanol Metabolism: Components and Variants in the Chromosome 4 ADH Region
<ul style="list-style-type: none"> • ADH1A, ADH1B, and ADH1C are methylated in HepG2 cells²⁰⁷ <ul style="list-style-type: none"> ○ Act like “control logic” areas for ADH1A, ADH1B, and ADH1C • ADH1B has three variants (alleles). ADH1B*1 is further analyzed in this paper <ul style="list-style-type: none"> ○ ADH1B*1 – codes for arginine (Arg) in position 48 and 370 <ul style="list-style-type: none"> ▪ Slow alcohol metabolism (uptake, degradation) ▪ This is the focus of epigenetic assessment in this dissertation and is the most common allele ○ ADH1B*2 – codes for histidine (His) in position 48, common in Asians <ul style="list-style-type: none"> ▪ More rapid oxidation of ethanol to acetaldehyde (faster ethanol metabolism or uptake) ○ ADH1B*3 – codes for cysteine (Cys) in position 370, common in African <ul style="list-style-type: none"> ▪ Results in reduced alcohol uptake or metabolism ▪ Unpleasant association with elevated aldehyde levels through rapid metabolization of alcohol • ADH1B and ADH1C – give different rates of ethanol metabolism in liver, but work together²⁰⁸

Note that case ADH1B*1 is further discussed, including Figure 17 that shows how epigenetic adaptation for could take place, while ADH1B*2 and ADH1B*3 are not.

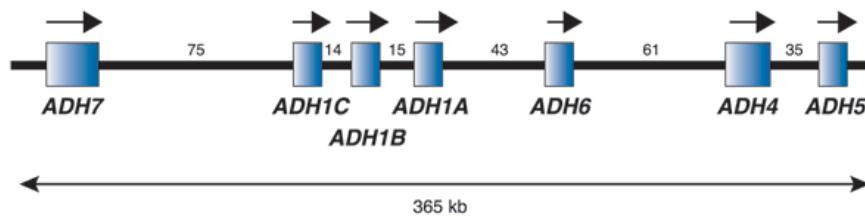
Edenberg describes how the seven human alcohol dehydrogenase (ADH) genes are found on the long arm of Chromosome 4 (note the long arm of Chromosome 4 is also called 4q). Figure 11 from Edenberg shows this pictorially with the arrow showing the direction in which way they are transcribed.²⁰⁹

²⁰⁷ Dannenberg, Luke. et al., “Differential Regulation of the Alcohol Dehydrogenase 1B (ADH1B) and ADH1C Genes by DNA Methylation and Histone Deacetylation,” *Alcoholism: Clinical and Experimental Research* 30, no. 6 (June 2006).

²⁰⁸ Feng Zhou and Stephen Mason, “Genetic and Epigenetics of Fetal Alcohol Spectrum,” *Frontiers in Genetics*, June 2015. Zhou et.al. also note that ADH1B and ADH2 are strongly linked to alcoholism, but only ADH1B is focused on here.

²⁰⁹ Edenberg, Howard. “The Genetics of Alcohol Metabolism, Role of Alcohol Dehydrogenase and Aldehyde Dehydrogenase Variants,” *Alcohol Research and Health* 30, no. 1 (2007).

Figure 11. Seven ADH Genes on the Long Arm of Chromosome 4



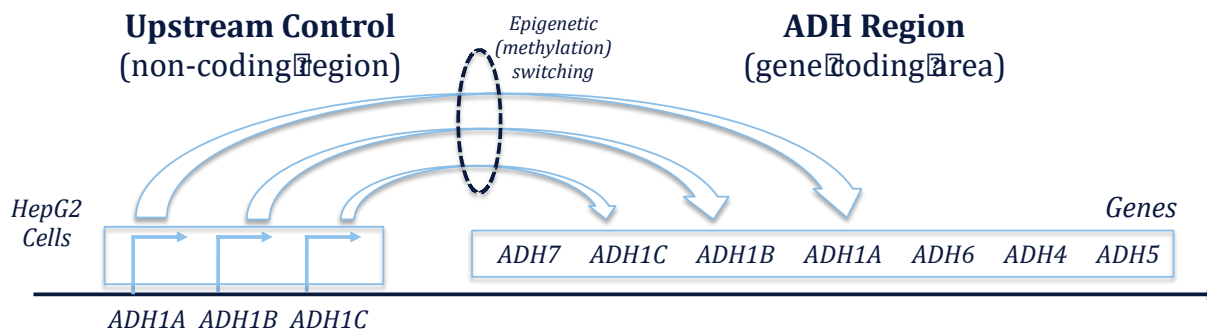
This figure shows how ADH is composed of a number of smaller components acting together.

Epigenetic Components

The previous section discussed changes in the DNA sequence, but this section will show how DNA sequences can stay the same yet still be changed chemically. This section highlights mechanisms for epigenetic modification for alcohol metabolism. The findings discuss control structure findings for the gene regions mentioned above. The bottom line is that there are research findings that show how epigenetic mechanisms can regulate and even override gene function for alcohol metabolism. Dannenberg notes that ADH genes are regulated by epigenetic mechanism in human hepatoma cells. In transcription, epigenetics impacts the regulation process. The upstream regions of ADH1A, ADH1B, and ADH1C are methylated in HepG2 cells—the human hepatocellular carcinoma cell line HepG2. Epigenetic modifications also play a role in the temporal expression of ADH genes. Dannenberg found that the upstream regulatory region of each class I ADH genes is methylated in HepG2. First, ADH1B was stimulated by treatment of HepG2 cells with 5-aza-dC. Methylation of the ADH1B proximal promoter in vitro reduced ethanol metabolism activity when transiently transfected into H4IIE-C3 control cells. This DNA methylation inhibited the binding of activators (i.e. upstream stimulatory factor, USF, binding) to the ADH1B promoter. Second, ADH1C was stimulated by treatment with either 5-aza-dC or TSA, which is an HDAC inhibitor known to promote epigenetically “positive” chemical marks. These more specific findings for ADH1B and ADH1C support the premise that

the class I ADH genes are regulated by epigenetic mechanisms in human hepatoma cells. DNA methylation within the ADH1B proximal promoter decreases its activity.²¹⁰

Figure 12. Upstream Control and the Mechanism for Epigenetic Change



Additional Alcohol-Related Epigenetic Findings

There is elevated DNA methylation in alcohol patients.²¹¹ The genome interacts with its environment, which results in epigenetic change at CpG sites. There is further evidence for the association between ADH and ALDH and alcohol dependence.²¹² Drinking is a choice. One can create an environment where elevated levels of alcohol in one's body becomes a typical state. This can lead to chronic use, which causes a change in that individual's homeostasis. An environment filled with chronic alcohol dictates a new target for our homeostasis. Chronic alcohol exposure causes widespread changes in brain gene expression that lead to behavioral tolerance and alcohol dependence. According to Ponomarev, "Studies assessing epigenetic regulation of individual genes in the brain have shown that alcohol's effects on DNA methylation depend on a variety of factors, including the specific gene targets, developmental

²¹⁰ Luke Dannenberg, et al., "Differential Regulation of the Alcohol Dehydrogenase 1B (ADH1B) and ADH1C Genes by DNA Methylation and Histone Deacetylation," *Alcoholism: Clinical and Experimental Research* 30, no. 6 (June 2006).

²¹¹ Ibid.

²¹² Vanessa Nieratschker, et al., "Genetics and epigenetics of alcohol dependence," *Journal of Molecular Psychiatry* 1, no. 11, (2013).

stage of exposure, and type of neuronal tissue affected.”²¹³ At least 20 percent of the variance in the generalized vulnerability to substance dependence is attributable to SNPs. The additive effect of SNPs is shared across important indicators of comorbid drug problems.²¹⁴

Tollefsbol examines many aspects of epigenetics. One area he explores is epigenetics and alcohol consumption. He notes that chronic alcohol consumption results in reduced levels of S-adenosylmethionine, which aids in DNA hypomethylation. Epigenetics facilitate brain adaptation associated with alcohol addiction and withdrawal and may contribute to the mechanisms for organ harm. Alcohol impacts DNA methylation, as seen by changes in medial prefrontal cortex gene expression and alcohol-related actions in rats. Alcohol ingestion regulation was impacted multi-generationally in rats. Alcohol impacts neural stem cell differentiation and DNA methylation patterns. It also causes epigenetic modifications in hepatic stellate cells. Tollefsbol goes on to note that chronic alcohol use “changed DNA methylation, histone methylation and acetylation, and microRNA, affecting expression of multiple genes in the brain and contributing to brain pathology and plasticity associated with alcohol abuse and dependence.”²¹⁵

UNIT 2: Genetic and Epigenetic Data Assessment

Introduction

This section examines genome-wide association studies (GWAS) data, and refers to results from epigenome wide association studies (EWAS), considering alcohol metabolism and how including faith and religiosity factors improve understanding of the findings. Genome

²¹³ Igor Ponomarev, “Epigenetic Control of Gene Expression in the Alcoholic Brain,” *Alcohol Research: Current Reviews* 35, no. 1, 2013.

²¹⁴ Rohan Palmer, John McGeary, “Models of drug addiction: Theories and future applications in prevention and treatment,” *Brown University Child and Adolescent Behavior Letter*, May 2016.

²¹⁵ Trygve Tollefsbol, *Handbook of Epigenetics: The New Molecular and Medical Genetics* (Birmingham, AL: Elsevier Science, 2017), 487.

research is advancing from DNA sequencing to advanced techniques that map trait and disease relationships with the genome. With epigenetic adaptation to environmental changes, there are interesting epigenomic results that are being uncovered, showing examples of gene overriding behavior (e.g. methylation switching). GWAS projects are doing what is called genotype imputation, which shows alcohol and substance abuse relationships with specific areas in DNA. GWAS projects are mapping replicable genetic associations with behavioral traits in order to better understand how various forms of metabolism and specific diseases, conditions, and predispositions are mapped into populations.

Matthews and others have pointed out studies that show health impacts in individuals who have active experience with religiosity factors like faith, prayer, and church attendance. After summarizing these sample projects, a discussion of proposed insights will be given. Faith can have an impact on health and behavior, even in overriding genes. There is awe inspiring order and design in molecular biological operation and the interdependencies among cellular functions. The impact of faith and prayer is being studied academically²¹⁶ by examining the impact of “religiosity factors.”²¹⁷

As a part of the GWAS analysis, several interesting characteristics from the UK Biobank project are utilized to gather perspectives on alcohol metabolism. A specific area is examined, but other aspects deserve further research and are briefly highlighted here. A handful of related data results are summarized in the tables that follow as well: (1) never drank, (2) former alcoholic, (3) OCD, (4) lonely, (5) guilty, and (6) risk-taking. The first two focus on a key area

²¹⁶ Dale Matthews, *The Faith Factor: Proof of the Healing Power of Prayer*, 239-250.

²¹⁷ Kendler, et al., “Religion, Psychopathology, and Substance Use and Abuse: A Multimeasure, Genetic-Epidemiologic Study” *Am J Psychiatry* 154, no. 3 (March 1997).

of Chromosome 4 that has been researched for relationships to alcohol-related function, and it has been shown that certain key markers that are included in GWAS data sets. There is an interesting relationship between the two cases of “never drank” and what is called “former alcoholic” in the UK Biobank literature. These are shown in Figure 13. The other results for OCD, lonely, guilty, and risk-taking are shown in Figure 14 and Figure 15. There will be no detailed assessment for these additional signatures since they are not the focus of the dissertation, but there are some strong relationships in these data sets for a large number of GWAS markers.²¹⁸

Genome-wide association studies (GWAS) examine common genetic variants in different individuals to determine if any variant is associated with a trait. GWAS studies typically focus on associations between single-nucleotide polymorphisms (SNPs) and traits like major diseases. SNPs are nucleotides that show variation (different alleles) between A and T or G and C in a small set.

Alcohol-Related Assessment

The following assessment examines the relationship between identified alcoholic behaviors and molecular biological data. The UK Biobank data is an example of a large source of data with over 500,000 volunteer participants who answered a detailed medical survey questionnaire with a medical professional and provided a genetic sample in which information from each participant’s DNA was recorded. The goal of the UK Biobank data is to help health researchers determine specific genetic markers for various diseases.²¹⁹ Preprocessed UK Biobank published by Neale Lab is used for this analysis. For many of the UK Biobank focus

²¹⁸ UK Biobank, www.ukbiobank.ac.uk, accessed December 14, 2018.

²¹⁹ Ibid.

areas, Neale Lab has posted assessed data sets in the right form where additional focused analysis can be done.²²⁰

Processed Genetic Data Results

There is an important mapping of survey data and the corresponding genetic data that is associated with these participants. Each UK Biobank participant completes a variety of survey data questions via a touchscreen interface. Additionally, there is an interview with a health professional for additional information, including getting historical information about the participant's past experiences with cancer, illnesses, and operations. From the UK Biobank Data questionnaire data, two cases are focused on. Table 15 and Table 16 in the Appendix list these UK Biobank participant alcohol-related survey questions.²²¹ First is the UK Biobank data field case 20117. For the question, "About how often do you drink alcohol?", the significant response that is used in this case is never. If an individual answers that he or she has never used alcohol, this answer forms a unique profile that is captured in a test case. With over 24,000 participants in this category, there are enough to form a good statistic. Second is the UK Biobank data field case 3781. This is a follow-on question for those who indicate they have never drink alcohol before and asks whether the participant "did you ever drink alcohol?" If an individual indicates that he or she had used alcohol in the past, this creates another profile. With almost 20,000 participants in this category, there is enough to make reasonable findings from this data. Information on the statistics and number of participants in each of these subgroups is shown in Figure 23 in the Appendix from the UK Biobank data showcase on their website.

²²⁰ Neale Labs UK Biobank GWAS Results. www.nealelab.is/uk-biobank, accessed December 3, 2018.

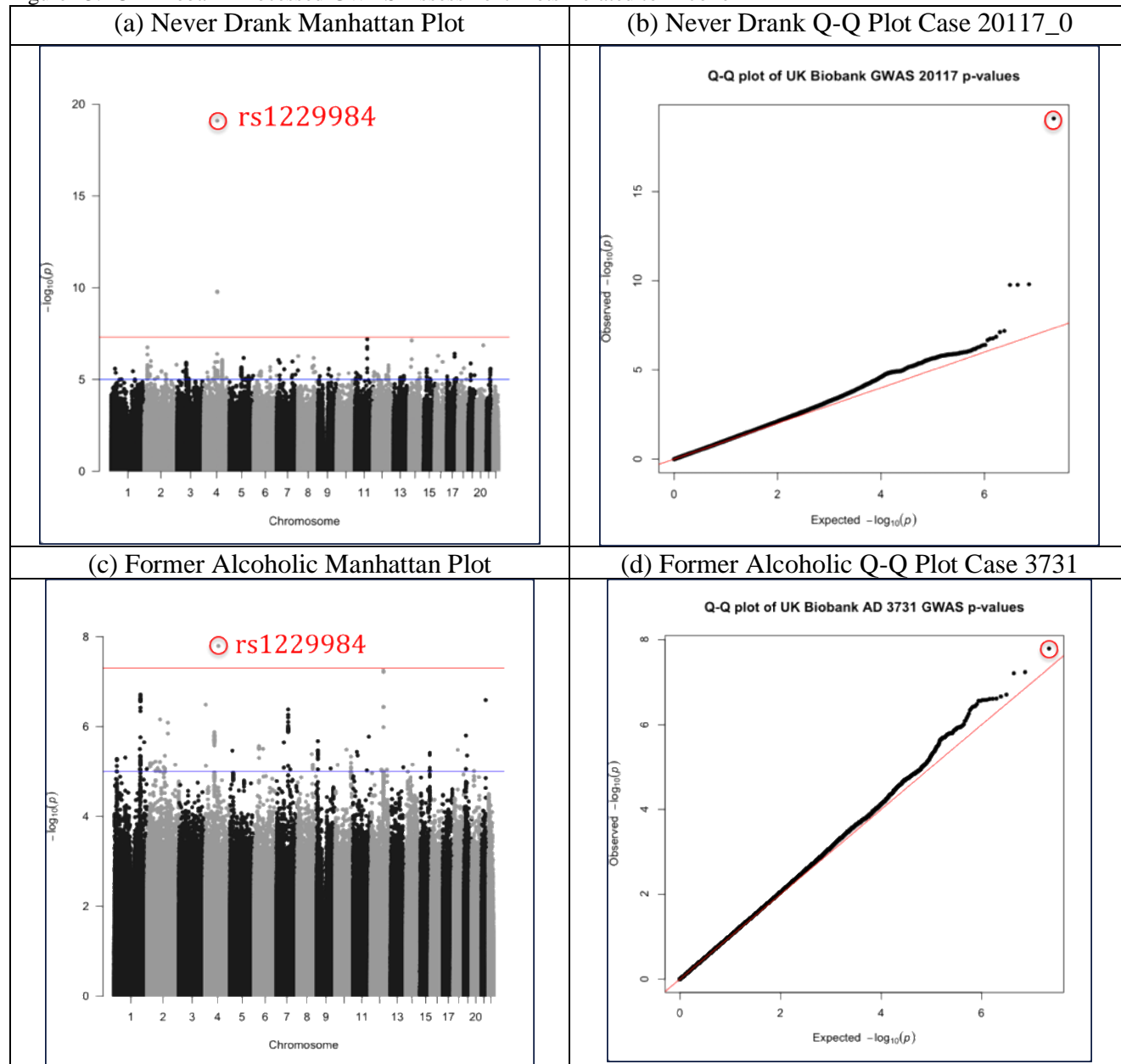
²²¹ UK Biobank touch-screen questionnaire final version, accessed March 12, 2019
<https://biobank.ctsu.ox.ac.uk/crystal/docs/TouchscreenQuestionsMainFinal.pdf>.

The following tables and plots show the results of a focused data analysis using the UK Biobank GWAS data. As developed below, the selected results are shown in Table 13 and Table 14, in the Appendix, and Figure 13. When including epigenetic adaptation with the results of these two cases, they show the biological mechanisms for positive adaptation as a result of redemptive activities. In the UK Biobank GWAS data, DNA samples from each participant are analyzed by quantifying the specific values of thousands of single nucleotide polymorphisms (SNPs) for each individual. These SNP results are recorded along with comparison statistics from the whole participant pool. Over time, the tendency is to nominate more and more SNP sample points within the 3.2 billion bits of human genome information to analyze and uncover more detailed relationships between genetic data and known disease pathology characteristics of individuals. Table 13 and Table 14 in the Appendix show the top 20 P-values, displaying the most distinctive features for the specific group. Figure 13 show graphical results for this data in two forms. The first are Manhattan Plots that show all the SNPs that are measured by chromosome. SNP values that are above the red line are more significant, since these are more strongly statistically aligned with the characteristic being measured as compared to other characteristics. The second are Q-Q Plots that show expected versus observed values. The Q-Q Plots show values that do not align with a linear data fit of all the SNPs. Both highlight the most significant SNPs. For both the “never drank” and “former alcoholic” cases, there is one SNP that is especially significant: the one shown in red, RS1229984. Table 12 in the Appendix shows the explanations for each column, which are processed data format outputs from Neale Labs analyzing the UK Biobank data. The columns that are used in the plots are CHR, BP, SNP, and P. The reference human genome that is used for the UK Biobank assessment is called hg19 and is also called GrCh38.

UK Biobank Survey Question Observations for Identified Cases

For the two identified UK Biobank data cases (20117_0 and 3731) that saw the same pronounced SNP RS1229984 relationship, the following questions apply. First, question A1, which is used for case 20117, asks, “About how often do you drink alcohol?” The answer for 20117_0 is response 6, never drank. Second, question A1A is a further qualifying question for those who respond that they never drank in question A1, and that question is, “Did you previously drink alcohol?” If the answer is yes, the response is captured in case 3731. These individuals self-identify that they do not drink but previously did. Third, if a person answers yes to A1A, associated with case 3731, it then asks question A7A for case 3859, “Why did you stop drinking alcohol?” The first four answers that specify defined reasons are illness (3859_1), doctor’s advice (3859_2), health (3859_3), and finances (3859_4). There also is a case for other reasons, but this data case is not captured in a subcase where the biological results can be viewed. No clear results are seen for the illness, doctor’s advice, health, and finances subcases like those seen with 20117_0 and 3731, “former alcoholic,” so there is no useful further discrimination of the survey individuals within the limitations of the questions asked.

Figure 13. UK Biobank Processed GWAS Assessment Plots Related to Alcohol

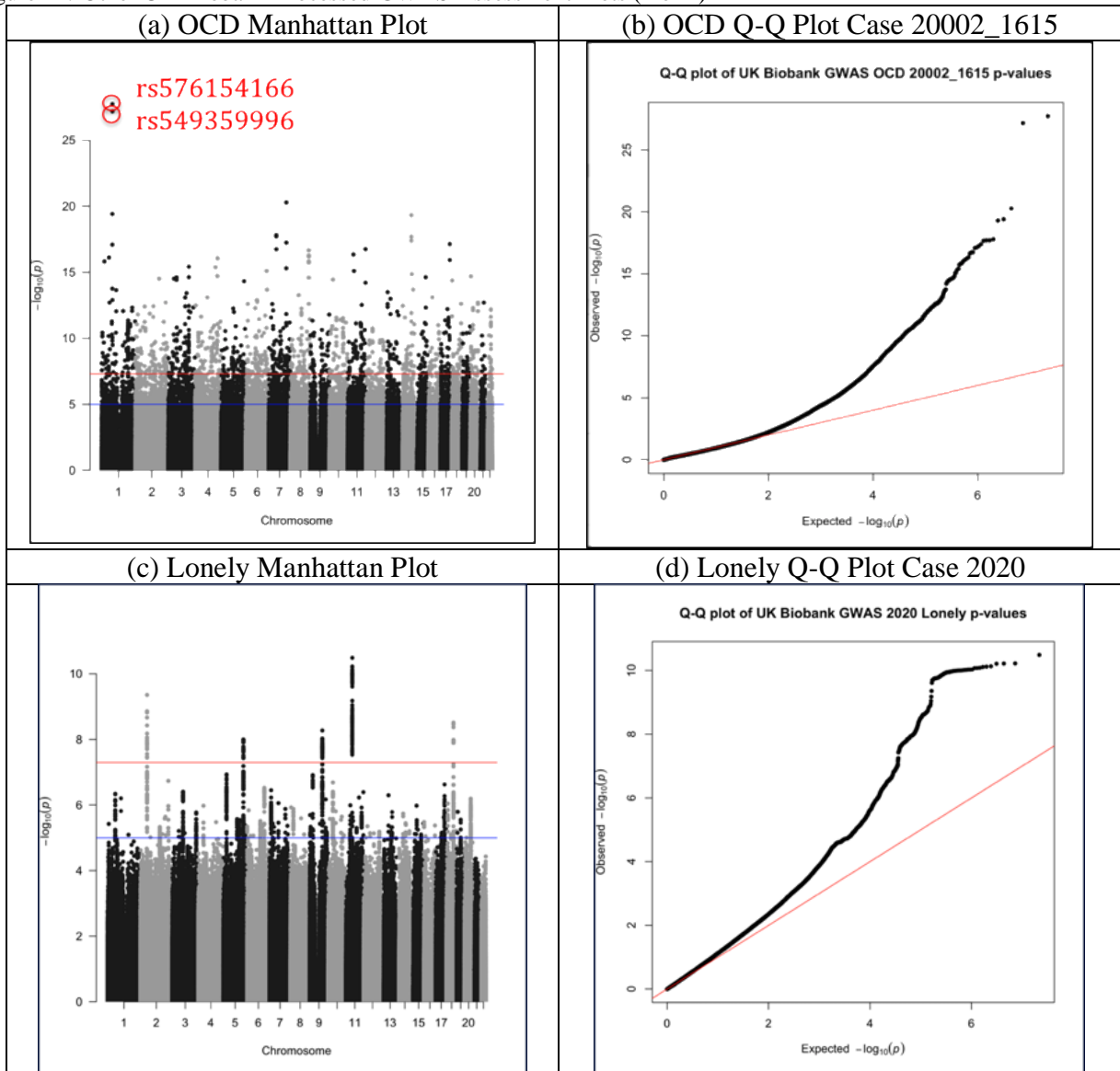


A few key tools used to generate the assessments are (1) the R Project for Statistical Computing, which centers around the R programming language that focuses on statistical computing and graphics,²²² and (2) a library of R packages called QQMAN developed by Stephen Turner.²²³

²²² The R Project for Statistical Computing, www.r-project.org, accessed December 3, 2018.

²²³ Stephen Turner, “QQMAN: an R Package for Visualizing Results Using Q-Q and Manhattan Plots,” *Journal of Open Source Software*, May 19, 2018, <http://joss.theoj.org/papers/10.21105/joss.00731>, accessed February 20, 2019.

Figure 14. Other UK Biobank Processed GWAS Assessment Plots (1 of 2)

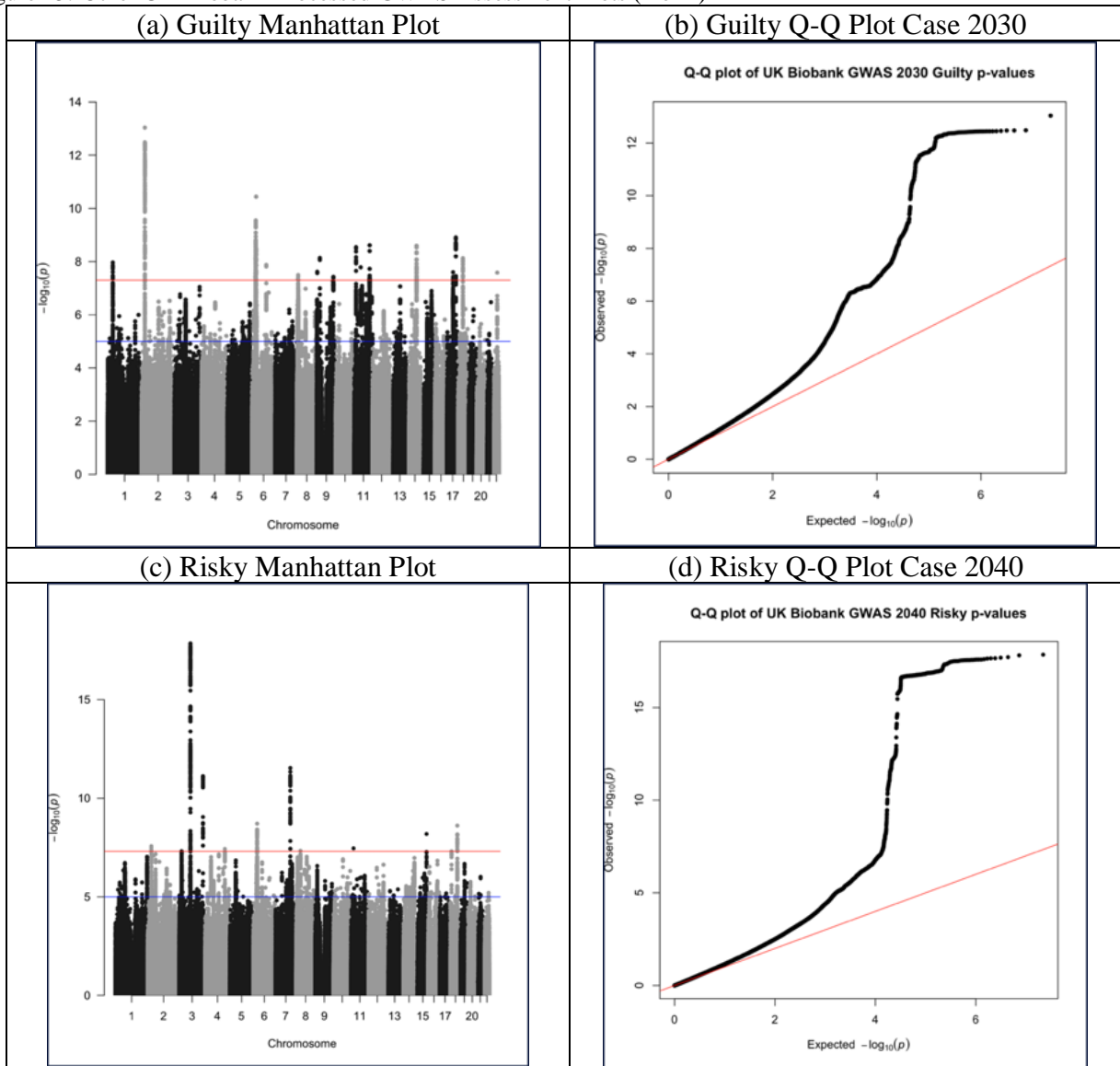


A few key tools used to generate the assessments are (1) the R Project for Statistical Computing, which centers around the R programming language that focuses on statistical computing and graphics,²²⁴ and (2) a library of R packages called QQMAN developed by Stephen Turner.²²⁵ OCD, case 20002_1615, shows two distinctive SNPs, while Lonely, case 2020, shows numerous SNPs involved in chromosome 11.

²²⁴ The R Project for Statistical Computing, www.r-project.org, accessed December 3, 2018.

²²⁵ Stephen Turner, "QQMAN: an R Package for Visualizing Results Using Q-Q and Manhattan Plots," *Journal of Open Source Software*, May 19, 2018, <http://joss.theoj.org/papers/10.21105/joss.00731>, accessed February 20, 2019.

Figure 15. Other UK Biobank Processed GWAS Assessment Plots (2 of 2)



A few key tools used to generate the assessments are (1) the R Project for Statistical Computing, which centers around the R programming language that focuses on statistical computing and graphics,²²⁶ and (2) a library of R packages called QQMAN developed by Stephen Turner.²²⁷ Guilty, case 2030, shows numerous SNPs involved in chromosome 2, while Risky, case 2040, shows numerous SNPs involved in chromosome 3.

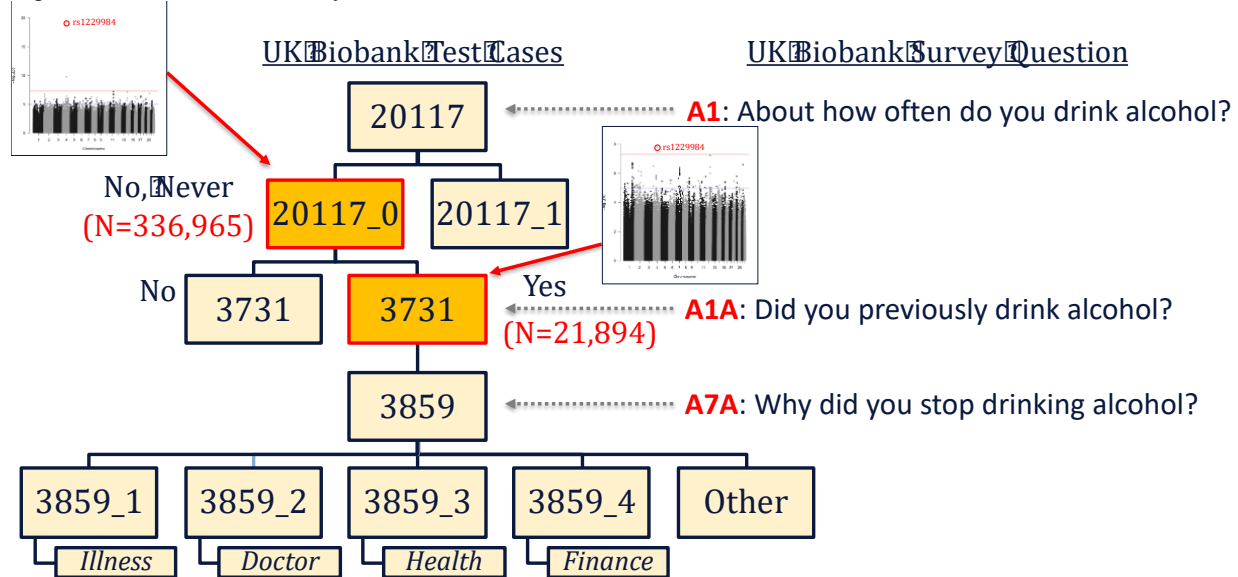
Figure 16 below shows the relationship between the relevant survey data questions and the Manhattan plots that were developed for cases 20117_0 and 3731. The hierarchical nature of

²²⁶ The R Project for Statistical Computing, www.r-project.org, accessed December 3, 2018.

²²⁷ Stephen Turner, “QQMAN: an R Package for Visualizing Results Using Q-Q and Manhattan Plots,” *Journal of Open Source Software*, May 19, 2018, <http://joss.theoj.org/papers/10.21105/joss.00731>, accessed February 20, 2019.

the survey questions and the test cases are included. The number of individuals for case 3731 is 21,894. This is a subset of the population in 20117_0, which is 336,965.

Figure 16. UK Biobank Survey Data and Manhattan Plots

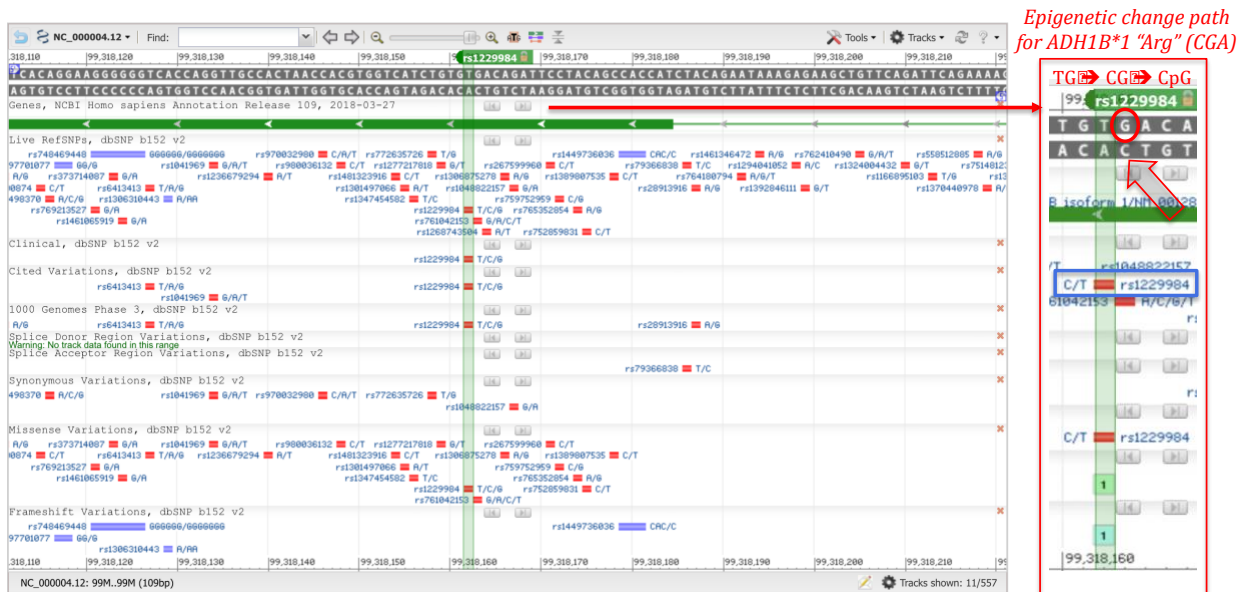


This figure shows the (1) relevant UK Biobank survey questions A1, A1A, and A7A, (2) the hierarchical relationships of the questions to one another, (3) the Manhattan plots for case 20117_0 and 3731, and (4) the population size for the two Manhattan plots.

There are various resources to assess further research results that have already been done for a particular gene or gene function associated with a particular SNP. For RS1229984 in Figure 17, one can see the following information from NIH that shows the nucleotides and related SNPs close to RS1229984.²²⁸ Additionally, a case for epigenetic adaptation for ADH1B*1 is shown on the right side of the figure:

²²⁸ dbSNP Short Genetic Variation Reference SNP (refSNP) Cluster Report: RS1229984, www.ncbi.nlm.nih.gov/projects/SNP/snp_ref.cgi?rs=1229984, accessed February 20, 2019.

Figure 17. Chromosome 4 Region Surrounding SNP RS1229984



This plot shows RS1229984 and its nearby nucleotides as reported by dbSNP. For GrCH38, RS1229984 is at base pair location 99,318,162 as shown in the center of the figure. It shows an allele variant which could respond to epigenetic adaptation (DNA methylation). This insert on the right shows how an epigenetic change could take place for ADH1B*1 forming an epigenetic adaptation site (DNA methylation CpG site).

The ADH1B gene within the context of the human reference genomes GrCH37s and GrCH38 is shown in Figure 18 and Figure 19 below. Both figures show the same ADH gene region. For GrCH38, RS1229984 is at base pair location 99,318,162, and it is found from base pair location 99,306,387 to 99,321,442.²²⁹ It represents a C/G variant, which could respond to epigenetic adaptation (DNA methylation). Note that for these two reference genomes, ADH1B contain the exact same nucleotides but are slightly offset in terms of base pair locations in Chromosome 4, showing the information content differences that are included in the GrCH37 and GrCH38 reference genomes. The two plots are processed using a tool called DNA Skittle, developed by Josiah Seaman.²³⁰ This DNA visualizer allows one to see nucleotide sequences and

²²⁹ Genetic Home Reference, “ADH1B Gene,” <https://ghr.nlm.nih.gov/gene/ADH1B#location>, accessed May 5, 2019.

²³⁰ Josiah Seaman, DNA Skittle, www.dnaskittle.com, accessed December 5, 2018.

Potential for Epigenetic Adaptation via DNA Methylation of SNP RS1229984

Since epigenetic adaptation is one of the areas that shows the most potential for illustrating redemptive biological activity, it will be described here in terms of how it could work for SNP RS1229984. Looking at the nucleotide structure of ADH1B in Figure 17, one can observe the sequence before and after the specific location identified with SNP RS1229984. Normally, RS1229984 codes for T. But an allele variant can instead have this location code for C. This can be described with the notation “T>C.” If this is the case, there is a type of sequence that can allow for epigenetic adaptation via DNA methylation. In more detail, this would mean that a T>C change would create an epigenetic adaptation site where DNA methylation can take place at this particular type of site called a “CpG” site, where there is a C followed by a G nucleotide. This is possible at this site since there is a G on the right of the C that was changed from a T. This is not the G to the left, although there is one on the other side as well. The DNA Methyltransferases (DNMTs) family of enzymes catalyze the transfer of a methyl group (the molecular biology unit that enables epigenetic adaptation) to DNA. There are two enzymes that are important to consider here. First, the DNMT1 enzyme is involved in the DNA methylation regulation of methyl groups (the epigenetic adaptation sites) to cytosine nucleotides (C). This is the maintenance enzyme for epigenetic adaptation sites. Second, DNMT3 can be considered the “de novo” enzyme, and its function is to create new methylation sites. Thus, DNMT3 creates, and DNMT1 regulates epigenetic adaptation sites. Since CpG’s are the sites (substrates) for DNA methylation by DNMT1 and DNMT3, it is conceivable that individuals with the SNP RS1229984 variant have an extra sequence for methylation.²³¹ An example of how this matches

²³¹ Trygve Tollefsbol, *Handbook of Epigenetics: The New Molecular and Medical Genetics* (Birmingham, AL: Elsevier Science, 2017), 8.

the UK Biobank results discussed in this section is developed further in the synthesis section and shown in Figure 20. Note that UK Biobank cases 20117_0 and 3731 both show RS1229984 with T>C being the lowest P value (i.e., the most significant factor) in each of their sample populations. This indicates that epigenetic adaptation is a factor in these two cases that should be considered when evaluating their relationship.

What Does the Nature of Alcohol Metabolism Imply in the Context of *Imago Dei*?

In order to suggest a vision of how human biological operations can operate in the midst of man's *Imago Dei* calling, this section discusses how engaging in one's *Imago Dei* mission and calling shows biological redemption for the case of alcohol recovery. Consider the nature of a biological function like alcohol metabolism in the context of *Imago Dei*, the impacts of sin, and a theology of creation that reflects God's divine intentions and purposes.

The specific test case area is alcohol metabolism and epigenetic adaptation. The assessment also considers how stimuli like prayer, spiritual formation, spiritual social networking, and God's intervention impact these areas. This dissertation approaches alcohol metabolism examination by first establishing a molecular biological model of man, acknowledging that man is made in the image of God (*Imago Dei*), and then considers the impacts of sin and the biological evidence that reflects in man's design to process God's redemption. The hypothesis is that human biology aligns with God's design and man's *Imago Dei* calling. In more detail, it argues that there is biological evidence that supports the following three claims:

Claim 1: Our biology is designed to process good in support of our mission.

First, in the *Imago Dei*, individuals reflect God and bear His image. There are many analogous attributes from God found in man. God provides food for mankind, and he is able to

metabolize it. The mechanism to process alcohol uses some of these image bearing attributes. If individuals reflect the goodness of God, then what they eat should be sustenance that builds their bodies up and restores them to a more energetic state where they are able to continue on in their God-ordained mission. A possible cause and effect relationship along this line could be that individuals are designed to flourish, and anything done when operating in the way individuals are designed should have biological mechanisms that support these things. What one eats makes him or her better, like what happened in the past with the Tree of Life.

Claim 2: Sin tries to block us and violate our biological design.

Second, due to the impacts of sin, people can choose to do destructive activities that harm their bodies and move them away from their mission as image bearers for Christ. Biological mechanisms that are made to build people up in their *Imago Dei* mission are now confronted with a “double bind.” Does human biology allow destructive elements into the body? Unfortunately, there is not a good answer. If the body allows it, the body suffers. If the body adapts epigenetically or otherwise to mitigate against the threat from continued exposure, the result is addiction and dependence on destructive elements. This ends up being a choice between two bad alternatives. In this case, a biological design inspired to support *Imago Dei* has to spend all of its time in dealing with the impacts of sin on biological function rather than its primary mission, but this is not the end of the story.

Claim 3: God’s redemption is manifested even in our biology to restore us.

Third, in terms of God’s intention and purposes, God’s redemption is available to mankind, even biologically. God reaches out to mankind, even to his body, in an attempt to offer redemption. God does not want to leave mankind in an addictive state. Epigenetic adaptation can break biological dependence. God does not want to leave mankind disconnected from Him.

These three claims reflect a possible interpretation for a biological component of creation, the fall, and redemption. This shows an example where in all the earth, into every level of creation, God is present and active.

Conclusions from Data Analysis

This section has examined various aspects of alcohol metabolism at a molecular biological level. The following four points are suggested as being evident: (1) the character of God, where theology sheds light on how God can speak directly into science as proposed by Clark, and how God's character qualities have parallels in nature as proposed by Poythress; (2) Divine design as suggested by Sanford, which from scriptural truth has a central goal of fostering relationships between God and man, and this includes what happens physiologically; (3) plans and design for redemption in molecular biological processes like epigenetics adaptation, in agreement with Scriptural precedents; and (4) mechanisms for recovery through the power of changing one's environment and how that can impact us all the way down to a molecular biological level via persistent change from epigenetic reprogramming.

Bodily systems work together at various levels. Cells have multiple layers of complex functions. The more evidence is found, the more complexity is uncovered. There is a connection and interdependency between various biological systems. Examination of UK Biobank GWAS findings show an example of biological redemption. Epigenetics show how human bodies can adapt to many factors – physical, emotional, and spiritual. Adaptation can be localized. A methodological approach has been defined in this dissertation and is used to consider the relationship between biology and spiritual activity. Genomic and epigenomic processes can be influenced by spiritual factors.

The ADH region has key enzyme ADH1B, which is heavily involved with alcohol

metabolism. This has three variants (alleles) as shown in Table 10. The ADH1B*1 variant is the most common and is evaluated in this dissertation. Epigenetic adaptation or methylation can change how this enzyme functions, either increasing or decreasing alcohol metabolism. Thus, like or dislike for alcohol could be overwritten epigenetically by adaptations that modify alcohol metabolism.

Alcohol impacts the whole body, with the brain, liver, and other areas being affected. Brain scans show brain function under the influence of alcohol, which allows for further understanding of the psychology and psychiatry associated with substance abuse. It also touches on higher-level cognitive function. Brain epigenetic methylation is hard to measure since it is wrapped up in brain tissue that is hard to access except for post modern autopsy evaluation.

Fetal alcohol spectrum disorder is very problematic since it negatively impacts child development at multiple levels. Somatic cells (non-inheritable cells) are impacted, with epigenetic methylation taking place. Unfortunately, germ cells (inheritable cells, passed on to next generation) are also impacted to future generations. Thus, this is a possible example of the sins of the father being passed on to future generations (Ex. 34:7).

The assessment of the GWAS UK Biobank data for different cases of alcohol use found that the non-drinker and former alcoholic cases highlighted the region of Chromosome 4 that codes for the first step in alcohol metabolism via the ADH gene. Both cases highlight the same SNP in the ADH enzyme as being the most significant feature for the population represented in each case (the SNP with a P value that is most distinctive from all the others for both of these test cases). This relationship suggests that there may be a common molecular biology feature between those identifying themselves as never drank and those identifying themselves as former drinkers.

In summary for the data analysis, this section examined alcohol (ethanol) metabolism as follows. First, a brief overview of the chemical processing of ethanol metabolism was summarized. There are two steps that take place in breaking down the ethanol molecule. ADH (*alcohol dehydrogenase*) is the key enzyme used in the first step. ALDH (*aldehyde dehydrogenase*) is used in the second step. Genome wide association study (GWAS) data from the UK Biobank project was analyzed. Based on the survey data they collected on alcohol use, the analysis looked for statistically significant molecular biology relationships. Two cases identified the single nucleotide polymorphism (SNP) RS122984 in the ADH coding area of Chromosome 4 in the ADH1B gene as the most significant common factor (P value) in (1) non-drinkers and (2) former alcoholics. There are possible reasons why these cases have the same strong factor. Although the UK Biobank data does not examine environmental factors, the literature review showed that a positive environment can help an individual move from being an alcoholic to one who does not drink. One area of research that is relevant and was explored was epigenetic adaptation. Supportive spiritual communities, religious practice, prayer, and divine intervention are all known factors that can impact health and enable individuals to deal with addiction. Epigenetic adaptation is known to override previously encoded ethanol processing, which is likely the case for the former alcoholic. How does this inform one's view of the image of God? At the molecular biological level, there is evidence for redemption and the ability for individuals to change with the help of a supportive environment. The opposite is also possible, where one can go against what is good for him or her. Epigenetically, one would adapt to these destructive choices as well. This illustrates another insight into the image of God. Individuals are created to operate in relationship, like God in the trinity, and to execute their *Imago Dei* mission. When they do not do these things, they act against their created nature and perform destructive

activities. When one goes against his or her image of God calling and dishonors the temple of the Holy Spirit, it has negative impacts. Therefore, molecular biology data appears to align with evangelical theology and provides greater insight into the image of God and how it is imprinted on man. There is molecular biological evidence that supports the theological concept of redemption and is labeled as biological redemption.

UNIT 3: Conclusions

Findings from Molecular Biology Assessment

The human body supports man's *Imago Dei* mission, and with this in mind, data was analyzed that illustrates how this operates. The UK Biobank data used in this dissertation is an example of a scientific source that looks at the relationship between disease pathology and molecular biology. The dissertation highlighted the results and relationships for the two cases 20117_0 and 3781. Case 20117_0, titled "never drank," represents a group who reports that they do not drink alcohol and thus do not have addictive craving for it. The assessment examined the distinctive SNP RS1229984, in the ADH gene from the first step of alcohol metabolism, which is substantially above all other SNPs. In comparison, Case 3731, titled "former alcoholic," represents a population that does not currently drink, but did previously in an alcoholic fashion. Case 3731 has the same distinctive SNP RS1229984 found in the larger Case 20117_0 group. This commonality suggests how a Case 3731 "former alcoholic" that is similar biologically to a Case 20117_0 "never drank" individual can act like someone who never drank. A possible scenario for how former drinkers could act the same as nondrinkers is described. The dissertation looked at the literature to document what scholars have said about genome processing, the human brain, epigenetic adaptation, and the impacts of alcohol, which is highlighted here. Sanford argues no human information system can compare to the processing that goes on in the

genome, and this should be kept in mind when assessing its function. One sees how biological mechanisms align with the concept of biological redemption. Matthews, Sanford, and others shows that the body responds and epigenetically adapts to positive changes like prayer, spiritual formation, community, religiosity factors, quality nutrition, proper exercise, and others.

Ponomarev also shows how the brain is most the complex biological tissue. It adapts due to the various stimuli and nutritional factors it is given to process. Consider the impacts of alcohol, for example. Tollefsbol documents how alcohol causes changes in brain gene expression. In his genetic and epigenetic alcohol research, Nieratschker shows how epigenetic mechanisms modify gene expression, which results in different outcomes from alcohol. Zhou documents examples of epigenetic brain changes from fetal alcohol that damaged gene expression. For example, Govorko reports that males transmit alcohol effects in reproduction.

Epigenetic adaptation can be either positive or negative. Biology reinforces the behavior one chooses. As seen in the case of alcohol metabolism, the body tries to return to its programmed design operating point by processing and eliminating the alcohol that is present in the system. Considering an implicate order perspective, if individuals are designed to be in a supportive and enriching environment like the Garden of Eden, then the body would default in its effort to reach a point of equilibrium that would be best for operating in that environment. In a supportive and enriching environment, there will be positive environmental factors that cause epigenetic adaptations in response to the continuing supportive elements. The body will respond and align to the positive spiritual context from this supportive environment.

Thus, from the molecular biology literature and the processed UK Biobank data, there are examples where the data shows human biology participating in activity that can be attributed to recovery and redemption. This recovery was illustrated by the epigenetic adaptation that takes

place in response to spiritual and environmental factors when an individual seeks to stop addictive alcohol use.

PART 4: Synthesis

Introduction

This section synthesizes the findings from the three previous parts of this chapter and gauges them with the four evaluation criteria. The theologically-informed explanation suggests Divine purposes and intentionality. This approach has greater explanatory power than methodological naturalism.

Part of this dissertation examined what is meant by being made in the image of God (*Imago Dei*) as seen from seven scholars representing a range in theological positions. Scripture states that man is created in the image of God for a God ordained mission. The views of LeRon Shultse, Wolfhart Pannenberg, Pope John Paul II, John Frame, Wayne Grudem, John Kilner, and Richard Middleton were considered, including how their theories influence views of biology and the body. First, LeRon Shults argues for an atheistic iconoclastic theology. His academic goal has become to distill the human value of theology while isolating it from God. He sees little value in the image of God, except culturally, so he can examine how it is used and benefits communities. Second, Wolfhart Pannenberg argues that historical science and human biology are the key measures to understanding man anthropologically. He suggests that theology should no longer be bound by Biblical dogma, although historically, Scripture proves critical in understanding the *Imago Dei*. Nature is the preferred relevant basis to understand man. Third, Pope John Paul II embraces the important theological and church value of the *Imago Dei* and impacts of sin. He also sees the body (and therefore its underlying biology) as being an important part of theology since the Word became flesh and dwelt among mankind. There are implications

to the body and marriage that should be considered to truly understand man in the body of Christ. Fourth, John Frame elaborates on the three offices human beings possess as image bearers of Christ in their *Imago Dei* mission: (1) king, where one has dominion over all other parts of creation, (2) prophet, where one has authority to seek godly standards for our culture, and (3) priest, which deals with presence and how individuals are called to fill the earth. Fifth, Wayne Grudem argues that *Imago Dei* means that man is like God and is called to represent God to the world around him. One never loses one's image, even by sin. Sixth, John Kilner advocates for the high value and mission of mankind being given the *Imago Dei* and how one should act upon its ethical implications. Seventh, Richard Middleton endorses understanding the *Imago Dei* by considering Old Testament and Ancient Near East meaning that formed the context for writing Genesis. He also sees the value of the body when examining *Imago Dei* in Old Testament scholarship and argues that the body is often missed, even though the vitality of the body is a component of spirituality. In summary, by looking at all of these views, one sees different vantage points and get a better and broader understanding of what the image of God means. The ultimate source of human understanding of the image of God is from Scripture. A scriptural view of the image of God elevates one's view of biology and the body, since human beings are fearfully and wonderfully made. Human biology animates man's *Imago Dei* calling and shows the design features God gave him as a reflection of Him.

This dissertation has shown there is enough to support the claims that there are threads of redemption in man's biological design and the demonstrated benefits of community, with spiritual communities having even more benefits than non-spiritual ones. Biological life is optimized to support the intended state of man, which was the scenario laid out in Eden, where man walked with God and had access to everything he needed for life and a vibrant existence in

community.

For alcohol metabolism, there are key genes that are part of this process. The ADH gene has been explored in detail within the UK Biobank data set in this dissertation, revealing a SNP that can experience epigenetic adaptation. Other published results also verify this relationship with the UK Biobank data set. There is epigenetic adaptation, or methylation, that can take place in alcohol metabolism. This is one of the physical changes that takes place in alcoholism. In many cases, this adaptive change is reversible, especially when dealing with readily available and utilized somatic cells (non-heritable cells) and not germ line cells (heritable cells) that are utilized as a part of reproduction.

Comparison via Evaluation Criteria

Four evaluation criteria are considered to examine the explanatory power of alternative views assessed in this dissertation. These criteria draw from methods in different disciplines, which will enhance the evaluation scope. Four evaluation criteria are used. First, from the field of anthropology and theology, this dissertation looked at Pannenberg's historical science and human biological anthropological evaluation measures. Second, from the field of physics, the dissertation looked at a deeper understanding of reality by including implicate order, and not just explicate order, by analyzing existing empirical data. Third, the dissertation considered when and how to include theological method and knowledge by using explanatory filters and the inference to the best explanation. Fourth, this dissertation considered how to form arguments by exploring abductive argumentation and aesthetic awareness.

Evaluation Criteria 1: Historical Science and Human Biology

Following the anthropological theological methodology proposed by Pannenberg, part of this dissertation has included a historical science assessment with the spiritual social networking

analysis of twenty-three Biblical and early church innovation champions and the human biology examination of the molecular biology and epigenetic adaptation association with alcohol metabolism.

For historical science, Pannenberg suggests that there is evidence that supports the existence of the *Imago Dei*. Man's special place in nature is due in part to his openness and awareness of things that intervene outside, and this can be traced to God. God is essential if one wants to establish the origin of spirit, and accordingly the special anthropological place man has. Unlike animals, man has the ability for self-reflection, or exocentricity, and to think abstractly about things. Mankind can ponder dispassionately about reality and his environment. Since historical science deals with the concrete lives of individuals and how they interacted with their history, the assessment in this dissertation of twenty-three individuals qualifies as a broad enough analysis of individuals called to act as innovation champions, influencing their cultures and social groups. They formed timeless influence with their written record far beyond their firsthand involvement. They each played a vital part in the formation of the emerging nation of Israel and the establishment of the New Testament church.

Regarding human biology, Pannenberg notes the key distinctive features that are characteristic of mankind that distinguish him from all other living creatures. This dissertation refines this idea further by focusing on the case of alcohol metabolism. The molecular biological way ethanol is processed in humans is not unique to man, but the reasons why one would drink alcohol and the full range of environmental epigenetic adaptation choices can be impacted by spiritual activities, which is exclusively found in human beings. Man can change by being in a supportive spiritual environment and practicing spiritual disciplines. Looking at the spiritual components in the context of man's role and the mission of the *Imago Dei*, there is significant

evidence for how adaptation and redemption can take place biologically.

As Pannenberg suggests, an understanding of man by from a historical study of individuals comes at the end of anthropological reflection. There are unique features of man that from both historical science and human biology support the uniqueness of man. This is not only a general observation, but it also shows biological support for man's missional calling with the *Imago Dei*.

Evaluation Criteria 2: Explicate and Implicate Order

As mentioned before, David Bohm notes that there is more to our findings than just explicit empirical findings. To truly understand the big picture, one should be aware of the explicate and implicate order of mankind revealed in molecular biology. Bohm considers this insight as he examines quantum theory. He suggests examining evidence from an implicate order point of view.²³² Bohm suggests that if one considers quantum theory, he or she will find evidence that does not align with his or her experience of macro-level interaction with nature. This is one of the dilemmas that has come up when considering modern physics and how to harmonize it with classical mechanics. When a theory does not completely agree with all the evidence, techniques for accommodation can be useful. This shortcoming indicates that the theory does not completely embrace all aspects of true reality. From a pragmatic point of view, one can resort to methods like Ptolemy's use of epicycles to correct earth centric astronomy. This Ptolemaic approach maintained a focus only on the explicate order. Bohm challenges readers to consider developing a perception of the whole. This means looking at the implicate side as well. From an implicate point of view, what is the data telling the observer? Bohm argues that this is

²³² David Bohm, *Wholeness and the Implicate Order* (New York: Routledge & Kegan Paul, 1980), 189-190

an important factor and represents the other half of proper evaluation of scientific data.²³³

Applying this implicate order to molecular biology and its mechanisms in alcohol metabolism, some factors are not fully explained by identifying explicit gene function and simply focusing on coding areas of DNA like ADH in alcohol metabolism. Taking into account theological knowledge and insight, one has a better chance of seeing the big implicate picture and getting a more accurate view of how and why molecular biological order actually works. As an illustration for using a design analogy, one cannot fully understand the function of a car without knowing what its design features are intended to do. Clearly, different makes and models have very different intended purposes, and accordingly, different design features and resulting automobile characteristics. For ADH and alcohol metabolism, one sees how there is a well-defined multi-step biochemical metabolism breakdown process that at the end produces products that are useful for the body. This process is also an adaptive process where things can change due to environmental factors and stimuli from sources like spiritual social networks and religiosity factors. Plus, within the metabolism design features, there are implicate factors that show redemptive qualities that align with theological principles. These cannot be explained well if only considering the explicate information that can be observed with empirical data. Another way of assessing the merit of a theologically-informed researcher over that of one using an exclusively methodological naturalistic framework is comparing the two alternatives via explanatory filters. This is considered in the next evaluation criteria.

Evaluation Criteria 3: Explanatory Filters and Inference to Best Explanation

The Evaluation Criteria 3: Explanatory Filters that were introduced in CHAPTER 3:

²³³ David Bohm, *Wholeness and the Implicate Order*, 177-182

METHODOLOGY are used here to assess if the theistic explanatory hypothesis in this dissertation has greater explanatory power than a methodological naturalistic, epistemological dualistic approach. When considering whether there is enough evidence to suggest that man is made and operates in the office established by God with the *Imago Dei*, this explanatory process may help pinpoint where the data points us based on what is presented in this project.

First, there is the *explanatory filter*. The basic question is, how well does the current theory perform? A naturalistic approach provides basic understanding of the underlying molecular biology, the genes associated with specific biological function, the details of alcohol metabolism that are commonly understood today, and epigenetic adaptation. It does not offer answers to why the body is designed in a certain way, or why looking at these functions makes many want to transcend beyond a basic empiricist view of the scientific data and examine larger spiritual and philosophical ideas on the topic. Alternatively, from theological sources, God lays out His plan and purpose for creation and *Imago Dei*. Considering what has been discussed in this dissertation with an open mind, there are points where the biological evidence aligns with the benefits of living in a manner consistent with His guidelines. From a filtering point of view, at a minimum, the findings pass this initial filtering step and warrant further examination.

Therefore, one may benefit from looking beyond the numbers and the empirical details of the scientific findings.

Second, there is the *domain filter*. Should the scientific method be augmented with theological method? If one wanted to consider the reality of the *Imago Dei*, what domains would be required to adequately do so? How does one quantify the merits of being in a social network, for example? Pannenberg argues that one has to use multiple disciplines to adequately come up with a comprehensive anthropological understanding of man. Researchers utilizing the

explanatory filter will likely see aspects of molecular biology that do not provide the tools to analyze the benefits of a supportive community. This would require tools from sociology and other disciplines. Understanding how biological functionality aligns with characteristics of God would at least require tools from theology and maybe other disciplines, as suggested by Poythress, Sanford, Clark, Mathews, and Pannenberg. They all suggest that there are many cases when the domain has to extend into interdisciplinary approaches and maybe beyond a naturalistic-only approach. Embracing a canvas that has at its disposal all the rich colors from a spiritual mindset can augment how one can gain much deeper insights into why things are designed in the manner they are. The scientific method has its place, but by definition limits itself to analyzing only the empirical world. How can one know if anything lies beyond the physical world if one does not allow other possibilities to be analyzed and developed?

Third, there is the *sensitivity filter*. What is a principle component that can be studied? This is an approach that is often used in mathematics to isolate one variable and see how sensitive it is to one specific parameter. For this particular assessment, the focus was alcohol metabolism. This has been shown to primarily be associated with the enzyme ADH. ADH has been shown to have a high correlation to alcohol metabolism, and alcoholism it gives a nice area to examine sensitivity and principle component analysis. Based on scientific research to date, alcohol metabolism is largely associated with a few key genes. Epigenetic adaptation can overwrite this behavior. Epigenetic adaptation can either be defense adaptation to constant presence of alcohol, or redemptive adaptation to withdrawal from alcohol and breaking the dependency on alcohol. For the positive form of epigenetic adaptation, there may be a path to recovery and redemption that aligns with man's *Imago Dei* mission and calling.

Fourth, there is the *characterization filter*. What known signatures are present that could

benefit from this expanded explanatory power? One can consider any potential outcomes for an individual who has a greater genetic and epigenetic predisposition to alcoholism. If there is a redemptive thread in creation from which one benefits and the utility of a spiritual supportive community is real, these provide a good argument to develop an understanding of the signatures through characterization.

Evaluation Criteria 4: Abduction and Aesthetic Awareness

Mankind seeks aesthetically pleasing things—expressions of beauty and order. One moves in the direction of seeking things that are pleasing and make him or her happy. Abductive reasoning and aesthetic awareness form a part of who individuals are designed to be. This tendency can be linked to man's desire to seek God. Individuals are drawn to amazing encounters with the beauty of nature. As seen in Genesis 1, after each day of creation, God would reflect on His creation and declare that it was good. Being created in the image of God, one has the ability to have that same experience, and individuals are drawn towards it. One is attracted to move in the direction of embracing God's handiwork, not only going there, but sharing this information with others and acting as an image bearer of God, testifying to what He has done.

Before more formal arguments begin, one starts with an abductive sense of how things should be. Beauty and order influence the relationships one conceives and what evidence one looks for. One forms abductive arguments that move him or her in a particular direction as he or she assesses aesthetic value. Since all human cultures possess the ability to comprehend aesthetic value, and the best explanation for this ability is supernatural causation, therefore, God's existence is the supernatural cause of man's ability to understand and appreciate aesthetic value. Methodological naturalism disconnects people from this process. By limiting admissible forms

of knowledge, this higher form of observation that comes from human perception and evaluation of beauty and order is missed.

Looking at alcohol metabolism and man's ability to experience redemption and spiritual awakenings as a result of practicing spiritual disciplines along with being connected to a supportive community, one observes how abductive reasoning and aesthetic awareness helps man gain insight into the implicate order of reality that can be uncovered. Through abductive reasoning methods, a theologically-informed individual will be looking for the higher implicate order that reveals how God is at work supporting individuals in redemptive activities. As one does the mission God calls him or her to do and act upon man's *Imago Dei* calling, one's biology supports him or her. Reflecting on these aesthetically appealing things, one experiences serenity and the hope of God at every level of assessment. In this dissertation, the three aesthetically pleasing levels that reflect the *Imago Dei* image are anthropology, spiritual social networks, and molecular biology.

Integration of Ideas and Hypothetical Logical Extensions via Triangulation

One can look at epigenetic reversible adaptations in the context of a theology of creation and participation in a networked community. First, God intends redemption for His creation and supports meaningful relationship between God and man. Man is meant to be an image bearer of God. One sees many examples in Scripture where individuals are told to be of a sober spirit and not inclined to much drinking. In other words, one can turn to God and experience one form of positive adaptation, which would include epigenetic methylation components, or turn to substances like alcohol and experience detrimental adaptation that would make it even harder to commune with God. Second, within a supportive networked community, one can find a great set of resources to make positive choices and live in a supportive environment where it is possible to

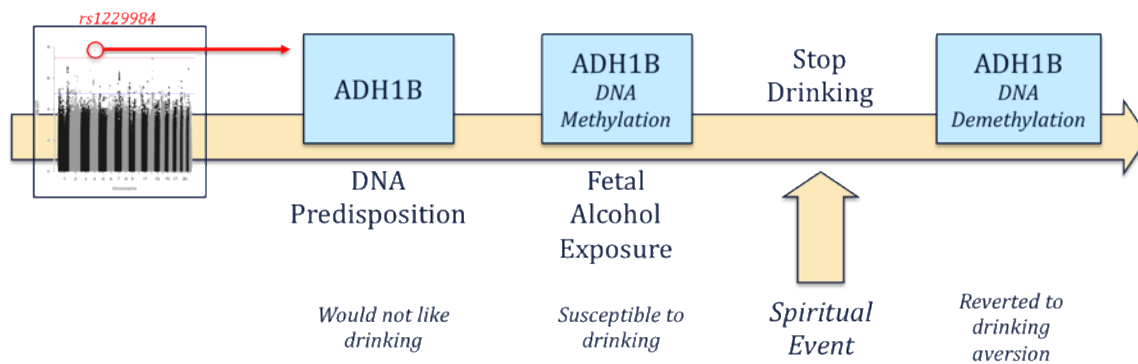
undo the impacts of sin. One can leave bad habits and hang-ups for an environment where changes can take place, even at an epigenetic level. Third, one can have a powerful influence on his or her spiritual community that can quickly ripple out into extended social networks as he or she acts as an innovation champion. Through the power of the Holy Spirit, people can be change makers and a source of revival that can have a positive impact on many. They can also be revived from the ills of this world. The healing and redemptive heart of God can come upon many, and it can also impact individuals biologically as there is need for healing and redemption.

From the molecular biology assessment of alcohol metabolism, this dissertation discussed cases in the UK Biobank data where individuals had greater chances for alcoholism due to the way they metabolized alcohol. Yet, through epigenetic modification processes, one of two situations can happen: (1) one can worsen the situation by substance abuse and related bad spiritual social network choices, or (2) one can mitigate and improve the situation by making healthy choices backed by the support of a spiritual social network, which can result in epigenetic modifications.

Consider a hypothetical situation that could bridge elements of the molecular biological alcohol metabolism findings together in the midst of an understanding of man's calling with *Imago Dei* and the reality of sin. Utilizing the idea of Triangulation suggested in the methodology section, one can put together ideas into a logical scenario and see how these things fit together. This suggests a reasonable inference to a good explanation that illustrates possible mechanisms to draw things together. Figure 20 shows a plausible example for the ADH1B gene (using an individual with the genetics that would match one of the participants from the UK Biobank, case 3731 "former alcoholic" discussed in the Processed Genetic Data Results section) to show four happenings: (1) being genetically wired with a predisposition to not like alcohol in

a pleasing way as seen with SNP RS1229984; (2) experiencing a past with fetal alcohol exposure could cause epigenetic methylation to overwrite this biological predisposition to not like alcohol and generate a situation in which an individual could become an alcoholic; (3) having a spiritual awakening take place in a positive networked spiritual community that provides an environment demonstrating the benefits of a change in lifestyle and the encouragement to stop drinking; and (4) overcoming the prenatal epigenetic adaption of alcohol metabolism by demethylation.

Figure 20. Possible ADH1B Genetic and Epigenetic Process Showing Redemption



PART 5: Conclusions from Analysis and Synthesis with Evaluation Criteria

Results from the Analysis and Synthesis

In this analysis and synthesis section, there was development of ideas in (1) establishing a theology of creation and *Imago Dei*; (2) showing how one operates better in a supportive networked community as opposed to operating alone or in a destructive network, as shown in a number of Biblical and early church fathers; and (3) examining molecular biology for a specific case, focusing on alcohol metabolism, abuse, and physiological and epigenetic adaptation.

Most theologians would agree to the centrality of the *Imago Dei* and sin. God reveals many truths to His children in the midst of specific real-life situations, but there are also general truths that one can see. Individuals are created in God’s image, and like God, are meant to be in relationship and in community. By God’s Divine decree, key tenets like relationship, redemption,

and community find parallels in the design of nature.

According to the Genesis account, man is an image bearer of God with a mission to represent Him in all areas of life. From a historical science point of view, as suggested by Pannenberg, the dissertation examined the lives of twenty-three innovation champions. They all actively engaged within their life circumstances and pursued their mission as image bearers of God as they best understood it. They influenced their social networks, communities, and cultures, both in their time and for future generations since their stories are recorded in the Biblical and early church records.

If man's *Imago Dei* mission is a central component of who humankind is, this will be a thematic element that will come up repeatedly when one looks at various elements of how people are designed. Looking at the higher implicate order level, one sees how people are designed to fulfill a calling and how they experience a sense of satisfaction when they fulfill that calling. This is reflected in multiple areas, like human beings' molecular biological make-up, physiological system operation, psychological mental health, and spiritual wellbeing.

Since there is evidence of how individuals can either move in the direction of spiritual fulfillment by following their *Imago Dei* calling and the biological benefits that come with it (including beneficial epigenetic adaptations) or more in the direction of focusing on self-fulfillment outside of community and failing to align with a higher spiritual calling (and the negative epigenetic adaptation associated with this direction), there is no biological evidence that forces individuals into one path or another. At a biological level, individuals have a free choice to do either what is good for them or what is bad for them. Either way, there are epigenetic adaptation components that tend to reinforce these actions.

Human beings are called to be part of a connected network in order to thrive. Just like

God is based in relationship with the Father, Son, and Holy Spirit, so man has to be in community relationship. This starts with family, but it extends beyond that. Individuals have to be connected in their ecosystem. Within that ecosystem, one can influence the other members, and they can respond. One can consider the tremendous lifespan of Noah, who lived in both the pre-flood world and the post-flood world. He was a source of history all the way back to the grandson of Adam. God spoke to him directly as well. Individuals could know the truth and experience he had. He knew the creation story and was able to convey it to many. This is an example of acting as an innovation champion who can possess a change agent, or contagion, that can positively impact many with the truth.

There are specific biological functions that support the execution of God's Divine plan. Within His design of creation, one sees His purpose of relationship, environmental adaptation, and the ability to enhance life experience through outside resources. The ailments associated with alcoholism have been explored in this dissertation. Instead of adapting for good, which was God's intent in the garden, one can destroy life and pass on this negative inheritance from generation to generation because of sin.

There is more that can be done in the evaluation of epigenetics. An organism has the same genome in all DNA-carrying cells (which is almost all cells), no matter where it is found in the organism. Unfortunately, the epigenome is different, and there are localized adaptations (methylation) of the genome all over the body. Similar in some ways to GWAS assessments, epigenome-wide association studies (EWAS) examine genome-wide sets of epigenetic marks where methylation takes place. Studying these data sets gives insight into the relationship between methylated genome areas and physical symptoms. Different functions and locations of the body can have localized epigenetic changes. This is more difficult than taking a blood, saliva,

or skin sample since epigenetic changes will not be the same over the whole body. Some areas are very hard to research, like brain methylation, unless one leverages information from sources like post modern autopsies.

Findings from the Evaluation Criteria

The results developed in the four evaluation criteria enhance the impact and magnitude of the conclusions of this dissertation. First, Pannenberg, with his perspectives on historical science and human biology components for developing an anthropology for man, suggests (and this dissertation supports) that there is a compelling argument for the uniqueness of man in possessing the *Imago Dei*. There is anthological evidence for biological redemption. Besides Pannenberg, the uniqueness of man and the involvement of the body in theology and redemption are also observed by Pope John Paul II, Kilner, and Middleton. Second, Bohm argues that one cannot effectively understand scientific data unless one considers the higher organizational level of the implicate order. Applying this idea to biology, the evidence suggests the presence of a higher implicate order where biology operates within the spiritual, relational, and emotional domains. Human bodies are a component of a greater design and has to be viewed from this vantage point. As Galanter points out, there is evidence that spiritual and biological components work together. When including theological understanding in one's understanding of human molecular biology, the implicate order suggests Divine causation and design. This opens up the opportunity to integrate science and theology together and seek what can be understood at this level. Third, Dembski can be applied to show that the best explanation for biological life is Divine causation. Biological function is intentionally designed in a particular way and is not just about maintaining organism life and function. With the use of explanatory filters, one can decide if and where to apply theological knowledge. I argue that for an assessment of biological

redemption, it should be applied. This dissertation showed an example in alcohol metabolism where this can productively be done. Fourth and finally, Von Balthasar argues that beauty completes one's understanding of theology. Beauty helps people see design in nature. The scientific data one uncovers causes him or her to seek and relish in the aesthetically pleasing order. It helps one see the possibility for a higher level of implicate understanding, moving him or her in the direction of God. Abductive arguments are formed seeking this higher aesthetically pleasing implicate order, and the source of this pleasing order is best understood to be God.

Thus, the evaluation criteria help build a more compelling argument that biology is involved in redemption. This assertion of a biological redemptive component that aligns with man's *Imago Dei* calling is the best explanation for the implicate order, and it logically integrates theological knowledge with scientific assessment and provides an aesthetically pleasing abductive explanatory argument of the data.

CHAPTER 5: OBJECTIONS AND LIMITATIONS

This chapter will deal with objections to the claims presented in this dissertation, applicability and limitations of this approach, and historical illustrations for how its method has been used with contrarian opinions and completing claims. It will also comment on what may be possible if more focused datasets were available.

Theologically-Informed Individuals and Situations

This section examines the experience of a few individuals and situations where theological knowledge was used in an active way.

Calvin's Interest and Attitude Toward Science

John Calvin was intrigued by what he saw in the natural world, but it was not his area of careful study. Using an analogy of faith that he borrowed from Romans 12:6, where each has his

or her own gifting, he believed one should interpret any doubtful passage with what is already known firmly in Scripture. If God is the author of both Scripture and nature, then of course the same interpretation principle would be applied to both “books” at once. Therefore, when a clear, well-founded reading of nature appears to conflict with a literal reading of the Bible, the solution is to pursue a Scriptural interpretation which, like true science, penetrates past the superficial and seeks consistency in what is already known to be true.²³⁴ So, in his theological home, he could reflect on the nature of creation and consider how to apply a good hermeneutic that could embrace the literal understanding of the Bible and nature. Calvin summarizes his views on science as God’s gift:

Wherever we come upon these matters in secular writers, let that admirable light of truth shining in them teach us that the mind of man, though fallen and perverted from its wholeness, is nevertheless clothed and ornamented with God’s excellent gifts ... Shall we say that they are insane who developed medicine, devoting their labor to our benefit? What shall we say of all the mathematical sciences? Shall we consider them the ravings of madmen? No, we cannot read the writings of the ancients on these subjects without great admiration. We marvel at them because we are compelled to recognize how pre-eminent they are. But shall we count anything praiseworthy or noble without recognizing at the same time that it comes from God? ²³⁵

Kepler and the Use of Our Minds

Scientific and theological themes resonated deeply with Johannes Kepler. He sought to understand insights that were accessible through the scientific methods of his day. Kepler thought that passages in the Psalms and Job 38 should point one’s eyes from natural philosophy to the scope and intent of Scripture. For example, Psalm 104 states that God laid the foundation of the earth. Kepler took this event as being the act of creation, not the formation of a fixed

²³⁴ Dennis Danielson, *The Book of the Cosmos* (Cambridge, MA: Basic Books, 2002), 122.

²³⁵ Jean Calvin and Ford Lewis Battles, *Calvin: Institutes of the Christian Religion*, Book 2 (Louisville, KY: Westminster John Knox Press, 1960), 273.

unmovable earth that the solar system revolved around. Kepler points out that God directs people to what one does not know, or what one has neglected. One can find clues to what is missing in his or her understanding by studying nature, God's creation. Kepler studied carefully the works of Tycho Brahe for the development of his cosmology. Brahe was so observant that he found eight minutes of arc error in the Ptolemaic calculations. He realized that, with a God of order, this difference could not be ignored. This led him to formulate insights (as an innovation champion) in celestial mechanics still used today in space travel and knowledge of planetary orbits. As reflected in Kepler's example, one can explore the existence and attributes of God in nature, which helps one experience in new ways the knowledge revealed in special revelation.²³⁶

Campanella's Defense of Galileo

Campanella was a Catholic priest who defended Galileo during his Inquisition. Campanella supported Galileo because he saw value in the argument that God is the author of both Scripture and nature and that one truth should not conflict with another. He argued that human science does not contradict divine science, since creation would not contradict the God who created it in any way. Theology does not require proofs from natural science, but showing how they do align strengthens one's convictions. There is at least one aspect of the supernatural that one can understand in terms of the practical and natural. Campanella engaged in a balancing act of praising Galileo but not idolizing him. From another important point of view, he also defended Galileo because there would be embarrassment in the Catholic Church should heliocentric cosmology be proven to be true. He firmly advocated the consistency of truth with truth, where both Scripture and nature should be considered.²³⁷

²³⁶ Gary Ferngren, *Science and Religion*, (Baltimore, MD: John Hopkins University Press, 2002), 163

²³⁷ *Ibid.*, 175.

The Paradigm of God's Two Books

Thus, one can consider God's two books to be the Bible and nature. This elevated view of nature can be seen in verses like "For since the creation of the world God's invisible attributes, God's eternal power and divine nature, have been clearly seen, being understood through what has been made" (Rom. 1:20). The study of nature, through science, reveals aspects of God's nature. In early modern times, God was an accepted part of reality, something to be acknowledged and revered. Unfortunately, over time, this unity broke down, and the alienation between religion and science grew. During his inquisition, Galileo argued that the Bible teaches how to go to heaven, but not necessarily how the heavenly bodies go. This opinion expresses a view of what the Bible provides explicitly, mainly truth about faith and salvation. Some would argue that the Bible does give useful information about science if one reads it carefully for these facts, but that science is not its primary function. It makes more sense from the historical record that there was a close linkage between the post-Reformation Christian clarity that impacted all areas of life and the emergence of a high regard for the exploration of nature and what it revealed about God. Even Immanuel Kant saw in awe the heavens: "Two things overwhelm the mind with constantly new and increasing admiration and awe the more frequently and intently they are reflected upon: the starry heavens above me and the moral law within me."²³⁸

Motivations That May Produce Incoherent Results

Unfortunately, even having all the best intentions can still lead one in the wrong direction. With science and theology drawing knowledge from very different domains, one has to acknowledge the possibility that he or she is incorrect. Theology deals with the understanding

²³⁸ Immanuel Kant, *The Critique of Practical Reason*, trans. Philip McPherson Rudisill, accessed April 17, 2019, <http://kantwesley.com/Kant/CritiqueOfPracticalReason.pdf>, 197.

and application of divine revelation. Science deals with uncovering insight into nature through the formation of theories that may be proven wrong over time. This section will discuss a few exemplary areas where in can come up.

Allegory

The overuse of allegory is an example of where incoherent results can take place. Patristics like Origen and theologians like Augustine tried to embrace allegory in hermeneutics. Allegorizing a biblical text involves focusing on words or phrases in a passage in the original context, and then correlating them with other words and realities having nothing to do with the original passage or context. For example, this misuse can occur when considering the lovers in Songs of Solomon and referring to them as Christ and the church. A hermeneutical issue is the proper extent for using allegory. Augustine would consider the literal and Christological interpretations of passages, like the Good Samaritan. This approach bounds the use of allegory. Origen was open to a broader use of allegory, and this continued in the Middle Ages and the medieval views of science. In the early church, nature was embraced as a canvas upon which to apply Scriptural allegory.²³⁹ In this paradigm, understanding natural law was not a priority. This approach was challenged in the Reformation through the notable work of individuals like Calvin. Seeking to understand the laws of nature was elevated as a God honoring activity rather than a secondary activity.

²³⁹ William Kurz, "Patristic Interpretation of Scripture within God's Story of Creation and Redemption," *Letter & Spirit, Vol. 7: The Bible and the Church Fathers: The Liturgical Context of Patristic Exegesis* (Steubenville, OH: Emmaus Road Publishing, 2011), 35-50.

Allegorizing Nature as Seen in Medieval Science

During the Middle Ages, the monasteries were key learning centers for lay people and remained steadfast in their Scriptural orientation, but with a general Augustinian perspective. They kept their focus on Scripture instead of examining the natural world. Studying nature would focus on finding allegorical associations with Scripture. This could lead to incoherent or at least incomplete results. The philosophies from Aristotle and Plato were integrated into church dogma up until the Reformation. Augustine in the fourth century argued that God made possible our knowledge of the world. In the thirteenth century, Aquinas believed that the world made our knowledge of God possible. Based on Aquinas' views, there was the possibility that there could be utility in looking at the world to know God better.²⁴⁰

One way that medieval research looked at nature was striving to find analogies between the macrocosm of the universe, for instance, and the microcosm of something like human beings. So, it follows that the human body is related to the universe since it was created out of the elements found in the cosmos. Therefore, research focused on finding correspondences between the human body and the material world. Amid this, the moral and psychological elements that were of primary interest to the church fathers were not completely disregarded.²⁴¹

Medieval hermeneutics tended to remove readers from the historical character of texts. Modern readers would see obvious historical connections, but in medieval times, these observations were not prioritized. In the medieval mindset, the historical narrative was made contemporary through higher levels of interpretative method. Allegory, tropology, and anagogy

²⁴⁰ Peter Harrison, *The Bible, Protestantism, and The Rise of Natural Science* (Cambridge: Cambridge University Press, 2001), 34-38.

²⁴¹ *Ibid.*, 50-52.

were used to move the reader from the past to the present. Considering texts of the past to improve interpretation were deemed unedifying. With the biblical literalism introduced in the Reformation, many Scripture passages were read for the first time with their historical hermeneutical sense being the priority. Many of these passages recounted important events that took place at times far removed from the readers. These passages were considered from the point of view of examining the literal truth contained in these events. Things like Genesis and creation, or the life and teaching of Moses, could be seen in fresh ways with this hermeneutical approach. The need to establish authorship and focus on authorial intent became vitally important.²⁴²

Textbooks written in the thirteenth century from church-authorized authors were of three types. First, there were books that would discuss the types of animals in their various forms of species and kinds. Second, there were encyclopedias that gathered together secular knowledge along with ecclesiastical information that provided perspective on this data, and third, there were recently translated works from classical antiquity. Although the encyclopedias were better than what was available previously since they were based on the latest understanding of natural information, they still experienced shortcomings in critical areas. The monasteries that would teach the people were largely anchored in Augustinian and Platonic ideology.

Natural Theology

Natural theology attempts to prove the existence of God and divine purpose through the observation of nature and the use of human reason. It addresses the existence and attributes of God through natural reason rather than knowledge derived from special revelation. With the increased mechanization understanding of nature in the seventeenth century, new perspectives of

²⁴² Ibid., 121-122.

God were developed. Boyle compared God's involvement in nature to a cathedral clock, where God created it and then let it run on its own. Leibniz argued that God was "large" enough that He set everything in order and then walked away. Individuals like Newton and Clarke tried to demonstrate that natural theology was incomplete without a supernatural agent to explain order and design. Newton and Clarke emphasized the freedom and power of the Divine will. If God willed, He could make a world that would require periodic reformation of the solar system. Leibniz argued that God would have had the foresight to make a world that did not need correction.²⁴³ Cornelius Hunter in *Science's Blind Spot* notes the limitation of a naturalistic approach:

The problem with science is not that the naturalistic approach might occasionally be inadequate. The problem is that science would never know any better. This is science's blind spot. When problems are encountered, theological naturalism assumes that the correct naturalistic solution has not been found. Non-natural phenomena will be interpreted as natural, regardless of how implausible the story becomes.... Theological naturalism has no way to distinguish a paradigm problem from a research problem. ... [The] problems are always viewed as research problems and never as paradigm problems.²⁴⁴

Science's blind spot can affect scientific results. Empiricism derives knowledge from experience and evidence. It does not have to start with a preconceived paradigm or theoretical framework. Seventeenth-century naturalism used non-scientific theological assumptions and believed God did not intervene in the creation and care of the world. Nature should operate mostly, if not exclusively, within natural laws. Below are three arguments from Hunter's *Science's Blind Spot*. First, naturalists created a greater God that was so big He did not intervene in creation after he made it. According to Hunter, "It would be clumsy for God to intervene

²⁴³ John Brooke, "Natural Theology," Gary Ferngren, ed., *Science and Religion* (Baltimore, MD: John Hopkins Press, 2002), 163-173.

²⁴⁴ Cornelius Hunter, *Science's Blind Spot*, (Grand Rapids, MI: Brazos Press, 2007), 44-45.

against nature. God created the universe so it hardly seems fitting that he would need to intervene in it. *A non-intervening God is a greater God.*"²⁴⁵ Rationalists sought to define a simpler Christianity that rejected doctrines that could not be deduced. This was the logic behind deism, which leads to naturalism. Hunter states, "Does God give us truths that cannot be concluded from reason and logic, or is Christianity a belief that a thinking person can arrive at independent of scripture? ... Rationalists argued that religious belief is a logical conclusion. It was, they said, a more a product of reason than an act of faith."²⁴⁶ Second, naturalists tried to distance God from the problem of evil. Some say no one doubted the existence of God until philosophers tried to prove it. Hunter asks, "What about the evil in the world? *There was a need to distance God and invoke natural causes as the source of the world's evils* ... Hume argued for a transcendent God who is not involved in nature. This would explain how the world could be so evil."²⁴⁷ Third, naturalists were against miracles since they required Divine intervention after creation. Rejecting Divine intervention would remove God from operating in the present affairs of the universe:

*The acceptance and influence of Hume's arguments against miracles signaled the next logical step in the progression towards naturalism. ... But soon it became something like a self-fulfilling prophecy as evidence was interpreted according to naturalism and then seen as supporting naturalism. Science it was said revealed a mechanistic world. In fact, the evidence did not reveal this; rather the evidence was interpreted this way.*²⁴⁸

²⁴⁵ Ibid., 20.

²⁴⁶ Ibid., 23.

²⁴⁷ Ibid., 25-26.

²⁴⁸ Ibid., 30.

Ramifications from the Reformers New Focus and the Cultural Response

Reformers such as Martin Luther, John Calvin, Phillip Melancthon, and Martin Bucer held a common view that the literal or natural sense of Scripture should be the basis for scriptural interpretation, along with a skeptical eye for allegory. Origen tended to disregard a text's grammatical interpretational sense and turned almost everything into allegory. This approach could distract readers from the plain meaning the author was trying to convey.²⁴⁹ The Reformers' desire to focus on literal interpretation is easy to see. A historical awareness for interpretation was emerging. Texts have a history, so scholars of this time started looking for authoritative documents, reaching back to the original autographs and material that would help the reader know the context in which each passage was written. Their conviction was the focus should be on what the original author wrote, and not on the subjective commentaries that came later.²⁵⁰ This new, literal means of interpretation opened up scientific exploration that could allow researchers to focus on uncovering the way nature worked. This was a good development. Unfortunately, it also opened up the door to minimizing the use and importance of theology in scientific exploration and initiated the unintended consequence of the separation of science and theology.

Alternative Explanation Claims and Responses

By strictly maintaining a methodological or philosophical naturalism approach, there would not be an attempt to link theological sources of truth with molecular biology. From this point of view, naturalists would want to have irrefutable scientific evidence that would prove the

²⁴⁹ Peter Harrison, *The Bible, Protestantism, and The Rise of Natural Science* (Cambridge: Cambridge University Press, 2001), 108.

²⁵⁰ *Ibid.*, 113.

existence of Divine design in the molecular biology. This proof would require combining truth derived from metaphysical and physical points of view. Since methodological naturalism excludes metaphysical input, there is not a common ground to work with to have this kind of conversation.

Three alternatives to the dissertation claim are discussed. These alternatives represent perspectives that are active in academic literature. The focused assessment of alcohol metabolism reveals that there are many layers of function that are all finely-tuned and adaptable. First, via spontaneous emergence, there is a yet to be understood capability in the natural order that causes innovation, emergence, and spontaneous self-organization. Arguments from James Shapiro and Stuart Kaufman are used for examples. Second, via spontaneous self-organization, there is a philosophical argument that scientific facts should be understood differently. The goal is to find a more compelling organization of the facts that better aligns with scientific data. Thomas Nagel's argument is used as an example. Third, via unguided development, there is the hypothesis that chance and enough time may allow for the development of life through natural selection.

Spontaneous Emergence

Shapiro argues that within natural genetic engineering, there is the possibility for something new to come forth, what can be considered some new form of innovation. Somehow, this innovation could be manifested on its own with the right circumstances:

How does novelty arise in evolution? Innovation, not selection, is the critical issue in evolutionary change. Without variation and novelty, selection has nothing to act upon. So, this book is dedicated to considering the many ways that living organisms actively change themselves. Uncovering the molecular mechanisms by which living organisms

modify their genomes is a major accomplishment of late 20th Century molecular biology.²⁵¹

Shapiro comments on how living organisms undeniably have the capacity to alter their own heredity:

The perceived need to reject supernatural intervention unfortunately led the pioneers of evolutionary theory to erect an a priori philosophical distinction between the “blind” processes of hereditary variation and all other adaptive functions. But the capacity to change is itself adaptive. Over time, conditions inevitably change, and the organisms that can best acquire novel inherited functions have the greatest potential to survive. The capacity of living organisms to alter their own heredity is undeniable.²⁵²

These are interesting ideas and sound compelling, but how can one know whether they are true with only the information available within methodical naturalism? Meyer rebuts Shapiro’s arguments concerning innovation by highlighting how to explain algorithmic complexity appearing in an organism:

ID [Intelligent Design] also makes predictions about the structure, organization, and functional logic of living systems. In 2005, University of Chicago bacterial geneticist James Shapiro (not an advocate of intelligent design) published a paper describing a regulatory system in the cell called the lac operon system. He showed that the system functions in accord with a clear functional logic that can be readily and accurately represented as an algorithm involving a series of if/then commands. Since algorithms and algorithmic logic are, in our experience, the products of intelligent agency, the theory of intelligent design might expect to find such logic evident in the operation of cellular regulatory and control systems. It also, therefore, expects that as other regulatory and control systems are discovered and elucidated in the cell, many of these also will manifest a logic that can be expressed in algorithmic form.²⁵³

Spontaneous Self-Organization

Stuart Kauffman introduces a similar idea to that of Shapiro by arguing for spontaneous self-organization. Since there is a perceived inadequacy of natural selection as an explanatory

²⁵¹ James Shapiro, *Evolution: A View from the 21st Century* (Hoboken, NJ: FT Press Science, 2011), 1.

²⁵² *Ibid.*, 2-3.

²⁵³ Stephen Meyer, *Signature in the Cell* (New York, NY: Harper Collins Publications, 2009), 484.

approach by individuals like Kauffman, he suggests something new. Thus, he is trying to add a correction factor to natural selection ideology. This is a response to natural selection not appearing to be adequate. As a result of this shortcoming, he suggests spontaneous self-organization, pointing to the limitations of evolutionary theory. While he admits to the shortcoming of evolutionary theory, he chooses to explore how to fix it rather than replace it:

In my previous two books, I laid out some of the growing reasons to think that evolution was even richer than Darwin supposed. Modern evolutionary theory, based on Darwin's concept of descent with heritable variations that are sifted by natural selection to retain the adaptive changes, has come to view selection as the sole source of order in biological organisms. But the snowflake's delicate sixfold symmetry tells us that order can arise without the benefit of natural selection. *Origins of Order* and *At Home in the Universe* give good grounds to think that much of the order in organisms, from the origin of life itself to the stunning order in the development of a newborn child from a fertilized egg, does not reflect selection alone. Instead, much of the order in organisms, I believe, is self-organized and spontaneous. Self-organization mingles with natural selection in barely understood ways to yield the magnificence of our teeming biosphere. We must, therefore, expand evolutionary theory."²⁵⁴

He also notes that much still has to be figured out:

Limitations of evolutionary theory: "*Origins of Order* and *At Home in the Universe* give good grounds to think that much of the order in organisms, from the origin of life itself to the stunning order in the development of a newborn child from a fertilized egg, does not reflect selection alone. Instead, much of the order in organisms, I believe, is self-organized and spontaneous. Self-organization mingles with natural selection in barely understood ways to yield the magnificence of our teeming biosphere. We must, therefore, expand evolutionary theory."²⁵⁵

From a philosophical point of view, Nagel makes an argument for teleological naturalism. He postulates a philosophical extension of science:

Pointing out their limits is a philosophical task, whoever engages in it, rather than part of the internal pursuit of science—though we can hope that if the limits are recognized, that may eventually lead to the discovery of new forms of scientific understanding. Scientists are well aware of how much they don't know, but this is a different kind of problem—not

²⁵⁴ Stuart Kauffman, "Prolegomenon to a General Biology," William Dembski, Michael Ruse, *Debating Design: From Darwin to DNA*, (Cambridge: Cambridge University Press, 2004), 151.

²⁵⁵ Ibid.

just of acknowledging the limits of what is actually understood but of trying to recognize what can and cannot in principle be understood by certain existing methods. My target is a comprehensive, speculative world picture that is reached by extrapolation from some of the discoveries of biology, chemistry, and physics—a particular naturalistic *Weltanschauung* that postulates a hierarchical relation among the subjects of those sciences, and the completeness in principle of an explanation of everything in the universe through their unification. Such a world view is not a necessary condition of the practice of any of those sciences, and its acceptance or nonacceptance would have no effect on most scientific research. For all I know, most practicing scientists may have no opinion about the overarching cosmological questions to which this materialist reductionism provides an answer. Their detailed research and substantive findings do not in general depend on or imply either that or any other answer to such questions. But among the scientists and philosophers who do express views about the natural order as a whole, reductive materialism is widely assumed to be the only serious possibility.²⁵⁶

Nagel argues there is a bright future ahead for what may be discovered:

It may be frustrating to acknowledge, but we are simply at the point in the history of human thought at which we find ourselves, and our successors will make discoveries and develop forms of understanding of which we have not dreamt. Humans are addicted to the hope for a final reckoning, but intellectual humility requires that we resist the temptation to assume that tools of the kind we now have are in principle sufficient to understand the universe as a whole.²⁵⁷

Nagel also acknowledges that the naturalist account is not satisfactory and other things should be considered:

But for a long time I have found the materialist account of how we and our fellow organisms came to exist hard to believe, including the standard version of how the evolutionary process works. The more details we learn about the chemical basis of life and the intricacy of the genetic code, the more unbelievable the standard historical account becomes.²⁵⁸

²⁵⁶ Thomas Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (Oxford: Oxford University Press, 2012), 4.

²⁵⁷ Ibid.

²⁵⁸ Ibid., 6.

Unguided Development

Moreover, there is natural selection and the related hypotheses of theistic evolution that are held by some Christians. The unguided development argument is that an unguided process (perhaps with right divinely aligned initial conditions) can produce life. Since this hypothesis largely aligns with natural selection, it is not dealt with in detail in this dissertation. One can argue the fact that there has not been any proof to date available that such initial conditions can be identified to support the complete evolutionary cycle of going from non-life to life, from simple life to complex life, and ultimately producing mankind, who is made in the image of God.

Focused Data Sets and Access

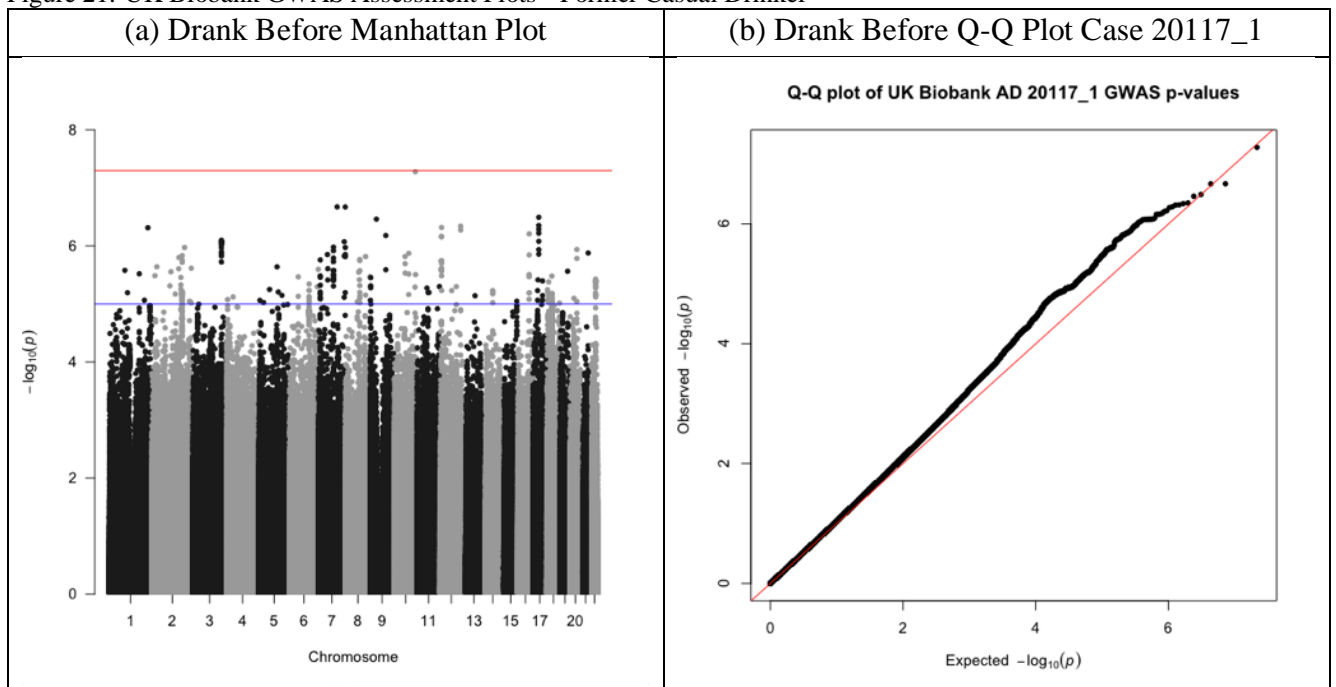
This dissertation has examined the relationship between identified alcoholic behaviors and molecular biological data. Getting access to the desired data that would maximize the assessment and demonstration of the impact for my dissertation hypotheses turned out to be more challenging than expected. For each GWAS data set, there are registration requirements to gain access to that specific data. After unsuccessfully trying to get access to one data set that had useful religiosity factors included in the questionnaire, I decided to use a large data set that had openly available information for some useful processed results. Additional post processing of this data was done.

Possible Objections from Other UK Biobank Data

Another test case from the UK Biobank data, test case 20117_1, illustrates a large population of individuals reporting that they drank before. This is a different, more inclusive case than the one where the participants are former alcoholics, case 3731. Classifying oneself as a former alcoholic, as stated in test case 3731, holds a much different connotation than simply stating one drank before. Former alcoholics admit that they were powerless over their drinking, while a

former drinkers indicate only that they drank before but not now. The available survey data does not further specify the distinctions between these cases. The GWAS data for this case does not show the alignment with ADH and SNP RS1229984. Some might offer this data test case as an illustration that there is no significant relationship between test case 20117_0 and 3731. The UK Biobank data created two separate cases, and the questionnaire answers are different for 20117_1 and 3731, so there is a difference between the two cases.

Figure 21. UK Biobank GWAS Assessment Plots - Former Casual Drinker



CHAPTER 6: CONCLUSIONS, IMPLICATIONS, AND FUTURE RESEARCH

Review

This dissertation discusses man’s *Imago Dei* mission and calling and surveys how that mission was accomplished in the lives of Biblical and early church innovation champions. This dissertation shows how one’s *Imago Dei* calling is enhanced by being in a supportive spiritual community that helps spiritual formation, and how that calling is sustained by a resilient human

body that, even in a fallen state, shows evidence of redemptive adaptation. The concept of biological redemption is developed to describe the redemptive adaptation a human body is capable of performing. Direct biological redemption takes place by the way human bodies are designed. Indirect biological redemption occurs as a result of spiritual formation activity and supportive spiritual community involvement. Indirect biological redemption is demonstrated through looking at alcohol metabolism and substance abuse, examining the biological impact of experiencing spiritual awakenings. Epigenetic adaptation, the process by which gene function is turned on or off, can take place in the ADH gene region associated with alcohol metabolism. The molecular biological assessment in this dissertation flagged the SNP RS1229984 in the ADH1B gene from the ADH gene region and shows how epigenetic adaptation could occur with the most common allele case.

Summary

This dissertation explores God's redemption and man's *Imago Dei* calling by exploring the three areas of (1) anthropology and the theology of creation, (2) spiritual social networking, and (3) genetic and epigenetic analysis. It highlights evidence that supports God's redemptive message and how human biology supports man's *Imago Dei* calling. One observes the transcendent God as a designer who cares deeply about people and provides a way for redemption, even in the details of human molecular biology. Man is designed for a mission with our *Imago Dei* calling and this dissertation showed an example where biological redemption takes place in support of man's mission. The example of alcohol metabolism was used.

God's redemption is incarnational. The ultimate form of redemption God provided for man was through the sacrifice of Christ, when He became man and dwelt among mankind. This is the historical act that makes all the other investigations into the depth and breadth of God's

redemption a beneficial endeavor to pursue. In all creation, one can see evidence of redemption. In this dissertation, specific aspects of this redemptive theme are examined in detail.

One can see how man's calling and mission, related to being made in the image of God (*Imago Dei*), is supported by features in human molecular biological design. The intent of this dissertation is apologetic, showing how human biology supports truth in Scripture. It shows the importance of how one's understanding of biology may inform his or her understanding of the image of God through the example of alcohol metabolism, illustrating how spiritual and biological components can work together in redemption for an individual to overcome alcohol abuse and be restored to vitality in man's *Imago Dei* mission.

The image of God (Gen. 1:26) provides sanctity for man's life and also relates to his mission on earth. For instance, this mission includes man acting in three roles: (1) as a king, where individuals are to rule creation, (2) as a prophet, where individuals are given the authority to redeem our cultures and communities, and (3) as a priest, where individuals bring the presence of God to the ends of the earth. As told in the Old Testament and characterized by Ancient Near East cultures, one can see a scriptural parallel to the image concept in Genesis 1-2 because individuals bear the image of the King as His emissaries wherever one goes, bringing the King's voice so all may hear. Man is given the call to rule over creation (Gen. 1:28 *subdue*) and the mission to bring the presence of God to the ends of the earth (Gen. 1:28 *fill*). Plus, individuals are fashioned for missional action, created for good works in Christ (Eph. 2:10) and commanded to go, make, and teach disciples in all nations (Matt. 28:19-20). One can see the special place individuals are given in creation (Gen. 1:26-28, Ps. 8, 1 Cor. 15:24-28). In man's missional actions, God wants, and designs for, man to be restored to Him when he fails in his fallen state so one can continue to reflect His image and represent Him.

Wise shows how priest, king, image, and service relate to biology,²⁵⁹ but in addition to this important discussion, these elements relate to one another in man's *Imago Dei* mission. These elements include mechanisms for redemption and recovery, which help man fulfill his mission in a fallen state. In order to show an example of how human biology is linked to man's *Imago Dei* calling and redemption, the case study of alcohol metabolism, abuse, and recovery was examined. Nutrient metabolism is part of what human bodies do to energize individuals to do their mission. Ethanol metabolism uses aspects of nutrient metabolism and is specifically composed of two major steps: breaking ethanol ($\text{CH}_3\text{CH}_2\text{OH}$) down first into *acetaldehyde* (CH_3CHO) by the *alcohol dehydrogenase* (ADH) enzyme, and then further breaking *acetaldehyde* down into *acetic acid* (CH_3COOH) with the enzyme *aldehyde dehydrogenase* (ALDH). An instance was examined where ADH can experience epigenetic modulation and change ethanol metabolism for an individual. ADH has locations where DNA methylation can take place (called CpG sites), along with alleles where additional CpG sites are created in a specific individual's DNA. This behavior was illustrated by looking at the ADH single nucleotide polymorphism (SNP) of RS1229984 with UK Biobank data for specific test cases. The epigenetic adaptation at the location that includes this SNP shows an example of where and how biology participates in recovery, redemption, and breaking the addictive cycle. Outside environmental factors cause epigenetic change.

Although in different domains, biological and spiritual components cooperate in aligning man towards God in complimentary ways, showing how God's redemptive design features minister to man when man fails. Epigenetic adaptation shows an example of how human molecular biology participates in redemption and recovery.

²⁵⁹ Kurt Wise, *Devotional Biology* (Nashville, TN: Compass Classroom, 2018), 31-40.

There are layers of finely-tuned systems within molecular biological and cellular life as shown in Figure 10 in the UNIT 2: Genetic and Epigenetic Data Assessment section. It is statistically nearly impossible that they could have all been generated and continue to be fully operational strictly by chance and natural processes alone.

Four evaluation criteria were used to show the utility of including theological knowledge in scientific assessment and the findings that can be concluded. First, historical science and human biology shows the unique stature of man by looking at the histories of specific individuals traces the influence of God. This was done for twenty-three biblical and early church innovation champions. Human biology shows the unique faculties of mankind. This was idea further expounded through a specific area of human physiology: the adaptive process of alcohol metabolism. Individuals are not ruled by instinct like animals but can adapt and transcend by practicing spiritual disciplines and having spiritual awakenings. Second, implicate order captures an approach for how to explain reality at an implicate level, instead of only looking empirical data and explicate order. Understanding is limited when strictly looking at explicate order. Just looking at the empirical data, one will never see the whole picture. Third, inference to the best explanation and a structured evaluation (like the proposed filtering analysis) shows one where theological knowledge can be included in improving explanatory power. The specific example of alcohol metabolism is used to illustrate this concept. Through triangulation, one can propose new logical inferences, and this can help with future research. Fourth, abductive arguments and aesthetic awareness show how mankind is drawn towards beauty and is influenced by it when conceiving arguments. This is a first step is turning towards God as one experiences nature, the creative expressions of man's *Imago Dei* nature, and the gifts one has with that elevated position (Psalm 8). At least one example of the sins of the father being passed down to future generations

(Ex 34:7) was shown, as seen by germ line (inheritable) cells being impacted by alcohol, resulting in alcohol-modified cells being passed on to future generations.

Conclusions from the Research Question

In order to communicate the conclusion, it is useful to return to the research question and summarize what has found in this dissertation. The research question asked is the following: *Can one, by looking at scientific and anthropological data, identify evidence that shows God's redemption?* Based on what is known from biblical passages showing redemption (e.g. 1 Cor. 6:19-20, Eph. 1:7-9, 1 Pet. 1:17-19, Rev. 5:9-10), God would want to make His redemptive biological evidence discoverable since it could encourage faith and help with the doubter, like Thomas (Jn. 20:24-29). One sees in Scripture where individuals were redeemed in their spirit and their bodies followed (e.g. Mark 2:1-12, Matt. 9:2-8, Luke 5:17-26).

The data to answer the research question comes from combining the results from the three assessments areas of: (1) the *Imago Dei*, showing how individuals are made and the mission one possesses; (2) spiritual social networking, showing how individuals are designed to be in community and called to be innovation champions with their unique talents; and (3) molecular biology, showing how the body acts and adapts in response to biological and spiritual inputs. By using the assessment findings, the evaluation criteria, and the concept of triangulation, one answers the research question. The dissertation results show that there is biological and anthropological evidence for God's redemption.

Since data is readily available for disease pathology and addiction, this is the source that was drawn from to show biological evidence for redemption and recovery. Galanter characterizes addiction as a chronic illness subject to relapse, and his research demonstrates that there is neuroscientific and biological grounding for the addiction and recovery as a result of

spiritual awakening. One can leverage Galanter and his work establishing the biological evidence for addiction and the benefits of spiritual activity. Then one can extend his work, characterizing it in terms of redemption and associating results with God. This dissertation did this first by examining separately the three assessment areas, establishing the evidence for each as summarized below.

Imago Dei

By examining the theology of the *Imago Dei*, this dissertation has shown that man's Divine calling and mission takes place in the context of people living and operating in their bodies. Scripture makes it clear that there is redemption for one's sins in Christ. The scope of that redemption is not just spiritual in nature, but it is supported by missional redemptive initiatives animated in the body. When one takes action in his or her *Imago Dei* roles of king, prophet, and priest and asks to be filled with the Holy Spirit, he or she is operating spiritually the way God intends. Empowered as God's emissaries, people bring to the ends of the earth God's message and presence. Man is redeemed from the penalty of sin and given by God daily what he needs to bout in the good contest of laboring to do his contribution of God's calling.

Studies were discussed that show the impact of prayer and engaging in faith. Prayer involves asking, making commitment, aligning oneself with the will of God, and abiding with the outcomes. Selvam points out that prayer provides a protective effect on addictive behavior. Byrd points out that prayer and intercessory prayer have a beneficial impacts on medical conditions and recovery. Lambert states that high spirituality and religiousness is associated with lower alcohol use. Harrell points out that religious coping is associated with less alcohol use. All of these examples reveal a redemptive biological component. Galanter found that Alcoholic Anonymous prayers are associated with self-reported reduction in alcohol craving. This finding

suggests a neural process underlying the effectiveness of these prayers, an undeniable biological component that he examined with his fMRI brain scans. Spiritual awakenings result in reduced alcohol use after treatment.

Thus, there is research evidence showing the impact of prayer and religion on human biology. These factors are instrumental in impacting medical conditions and recovery. Plus, when acting in the mission of the *Imago Dei*, there is the availability of redemption and recovery from the effects of sin.

Spiritual Social Network

Mankind is created to be part of an ecology of faith, growing and thriving in a spiritual ecosystem. Within man's *Imago Dei* mission, individuals do not act upon their calling alone but work together to fulfill their corporate missional calling and act as innovation champions. The dissertation looked at the lives of twenty-three biblical and early church innovation champions that illustrate how this works. In the literature review, there is evidence for the impact of supportive spiritual groups and the spiritual awakenings that come from them, such as the following: Hagen found that religiosity is a protective factor in reducing the number of bad and addictive behaviors. Jankowski suggests that religiousness can provide a protecting influence on adolescent hazardous alcohol use. Matthews states that being part of religious groups delivers greater health benefits than secular ones. Galanter found there is a high value in mutually supportive communities. He also found that Alcoholic Anonymous members experience a spiritual awakening like what took place in the Great Awakenings.

The evaluated innovation champions developed their faith in the midst of the life and ministry they were called to. They experienced God's redeeming work in their lives, helping them overcome sin, be empowered to do their calling, and be fortified biologically in their time

of need. For example, there is plenty of information about the life of Paul to observe samples of his biological redemptive responses. While ministering on a missionary journey in Malta, Paul was bitten by a poisonous viper but experienced no ill effect (Acts 28:1-6). Paul was often beaten, lashed, stoned, and left for dead, but he survived each encounter (2 Cor. 11:23-28). Paul personally experienced and wrote about how his outer man wasted away, while his inner man was renewed daily (2 Cor. 4:16). He encountered spiritual redemption and biological redemption, including miracles. Keener documents numerous divine miracles that have taken place as acts of God. All of these encounters include a biological component within the supportive intervention of a community.

Thus, from a spiritual social network point of view, community transforms individuals and imprints them with an enduring spiritual formation impression from the group that can take place from both direct interactions and through online technology. Even when one is no longer together with the community, the imprinting from the community remains, but over time, it will need to be refreshed. For the case of substance abuse, community helps individuals to recover from, and reduce the temptation by, addictive behaviors. Spiritual awakening takes place in community and results in a personal spiritually and emotionally charged experience that responds to and remembers the positive environment that the individual experienced. Like Galanter claims, this suggests that a biological component is active in spiritual awakenings. For the case of substance abuse, addictive cravings can melt away through spiritual formation and community. Certain tools are available to change behaviors and internalize spiritual and community support. Each person can act as an innovation champion in his or her community ecosystem, contributing his or her portion of the *Imago Dei* mission directive with his or her talents.

Molecular Biology

Man's body supports his *Imago Dei* mission, and with this in mind, data was analyzed that illustrates how this operates. The UK Biobank data used in this dissertation is an example of a scientific source that looks at the relationship between disease pathology and human molecular biology. The dissertation highlighted the results and relationships for cases 20117_0 and 3781. Case 20117_0, titled "never drank," represents a group who reports that they do not drink alcohol and thus do not have addictive craving for it. The dissertation examined the distinctive SNP RS1229984, in the ADH gene from the first step of alcohol metabolism, which is substantially above all other SNPs. In comparison, Case 3731, titled "former alcoholic," represents a population that does not currently drink, but did previously in an alcoholic fashion. Case 3731 has the same distinctive SNP RS1229984 found in the larger Case 20117_0 group. This suggests that a Case 3731 "former alcoholic" that is similar biologically to a Case 20117_0 "never drank" individual can act like someone who never drank. A possible scenario for how this could take place is described.

The dissertation also looked at the literature to document what scholars have said about genome processing, the human brain, epigenetic adaptation, and the impacts of alcohol, which is highlighted here. Sanford argues that no human information system can compare to the processing that goes on in the genome, and this should be kept in mind when assessing its function. One sees how biological mechanisms align with the concept of biological redemption. Matthews, Sanford, and others shows that the body responds and epigenetically adapts to positive changes like prayer, spiritual formation, community, religiosity factors, quality nutrition, proper exercise, and others. Ponomarev shows how the brain is most complex biological tissue. It adapts due to the various stimuli and nutritional factors it is given to process. Consider the impacts of alcohol, for example. Tollefsbol documents how alcohol causes changes in brain gene

expression. In his genetic and epigenetic alcohol research, Nieratschker shows how epigenetic mechanisms modify gene expression and experience different outcomes from alcohol. Zhou documents examples of epigenetic brain changes from fetal alcohol that damaged gene expression. Govorko reports how males transmit alcohol effects in reproduction.

Epigenetic adaptation can be either positive or negative. Human biology reinforces the behavior one chooses. As seen in the case of alcohol metabolism, the body tries to return to its programmed design operating point by processing and eliminating the alcohol that is present in the system. Considering an implicate order perspective, if individuals are designed to be in a supportive and enriching environment like the Garden of Eden, then the body would default in its effort to reach a point of equilibrium that would be best for operation in that environment. In a supportive and enriching environment, there will be positive environmental factors that cause epigenetic adaptations in response to the ever-present supportive elements. Plus, the body will respond and align to the spiritual direction it received from the community and in spiritual formation.

Thus, from the molecular biology literature and the processed UK Biobank data, there are examples where the data shows human biology participating in activity that can be attributed to recovery and redemption. This process was illustrated by the epigenetic adaptation that takes place in response to spiritual and environmental factors when an individual seeks to stop alcohol addictive use. There are no molecular biology studies that directly come to this redemptive conclusion since they were not designed to address such a research question. Still, the results that are shown align with this conclusion as has been summarized here.

Biology with a Mission

With man's *Imago Dei* mission, human biology plays a supportive role in ensuring that individuals are able to do their calling. In this light, even human biology has a mission. Everyone lives in a fallen world and suffers the effects of sin, and the penalty of sin leads all to death. Yet in the midst of individuals' lives, they are still called to fulfill their mission. Thus, in the time one has on earth, his or her biology will respond the way it is designed: to be supportive and responsive to a higher calling. In this regard, the complexity of human biological functions is high enough that one should unpack them into more particular areas that one sees evidenced in the data discussed in this dissertation. From a triangulation point of view, it follows that the human biology created for mankind in the Garden of Eden, designed to draw man closer to God and one another, will adapt to positive environmental, spiritual, and relational threads that man acts upon even in his fallen state. Human biology had to adapt to life in a fallen world, but the fundamental design imperatives are still in place. Human biology helps to lock people more into positive and connected relationships with God and those in their communities. Unfortunately, it can lock people into negative things, which can be seen in addictive behavior that moves them out of relationship and away from acting on their *Imago Dei* mission.

Biological Redemption and Its Taxonomy

When looking at Scripture and the findings from the three researched areas of *Imago Dei*, spiritual social networking, and molecular biology, there are examples of biological redemption. In order to make distinctions between them and align evidence with biological processes, three taxonomical categories were discussed: (1) direct biological redemption, (2) indirect biological redemption, and (3) special or supernatural biological redemption. Direct biological redemption captures "biology correcting biology," as evidenced by the pre-designed epigenetic mechanism

of grace. This mechanism is the same for the believer and unbeliever. This common redemptive covering is seen when Jesus shares that the sun rises, and the rain falls on the just and unjust alike (Matt. 5:45). Indirect biological redemption captures behavioral adjustment due to spiritual obedience that results in health benefits. This redemption could have a biological component, just like direct, but it would only be accessed by those who are informed by the fruit of the Spirit as a result of spiritual formation and supportive community involvement. Indirect biological redemption can be seen in Scriptural examples like the life-changing encounter of Mary Magdalene after anointing Jesus with oil (Mark 14:3-9). It is also exemplified in the life redemptive experience of Paul and the disciples, even in the midst of their suffering. Even though their outer man was wasting away, the inner man was being renewed (*amakainoo*, to make new) day by day (2 Cor. 4:16). Special or supernatural biological redemption can be seen in Scriptural examples like Jesus healing the paralytic (Jn. 5:1-15), raising Lazarus from the dead (Jn. 11:1-44), and the woman recovering from her chronic bleeding by touching Jesus' robe (Mark 5:25-34). Clear outside supernatural influences have to intervene in this form of biological redemption. In this case, the biology cannot act upon redemption in its broken state.

This dissertation research examined indirect biological redemption, looking for the evidence showing how individuals adapt and change as a result of having supportive spiritual environments and acting upon their *Imago Dei* mission. The concept of indirect biological redemption links the biological and spiritual factors that are reported in the studies to the data discussed in this dissertation.

Evaluation Criteria

The four evaluation criteria helped to enhance the impact and magnitude of the conclusions. First, Pannenberg, with his historical science and human biology assertions for

developing an anthropology for man, suggests—and this dissertation supports—that there is a compelling argument for the uniqueness of man in possessing the *Imago Dei*. The uniqueness of man and the involvement of the body in theology is also seen Pope John Paul II, Kilner, and Middleton. Second, Bohm argues that one cannot understand scientific data effectively unless one considers the higher organizational level of the implicate order. Applying this towards biology, the evidence suggests a higher implicate order where biology operates with the spiritual, relational, and emotional domains. Human bodies are a component of a greater design and have to be viewed from this vantage point. As Galanter points out, there is evidence that spiritual and biological components work together. When including theological understanding in understanding nature, the implicate order suggests Divine causation and design are at play. This opens up the opportunity to integrate science and theology together and seek what can be understood at this level. Third, Dembski can be applied to show that the inference for the best explanation for biological life is Divine causation. Biological function is intentionally laid out, and just to maintain organism life and function. With the use of explanatory filters, one can decide if and where to apply theological knowledge. I argue that it should be applied for biological redemption, and this dissertation has shown examples of where this can be done productively. Fourth and finally, Von Balthasar argues that the inclusion of aesthetics in a complete understanding of theology helps one see that looking at nature and scientific data the dissertation uncovers causes one to seek and relish in an aesthetically pleasing higher level of understanding, turning the focus in the direction of God. Man's abductive arguments are formed by seeking this higher, aesthetically pleasing order, and the source of this pleasing order is best understood to be God.

Thus, the evaluation criteria have built a more compelling argument that biology is involved in redemption. This assertion of a biological redemptive component aligns with man's *Imago Dei* calling, is the best explanation for the implicate order, logically integrates theological knowledge the scientific assessment, and provides an aesthetically pleasing abductive argument for an understanding of human biology.

Limitations

This dissertation had to make do with the molecular biological data available. Since there is active research taking place looking at mechanisms for disease pathology, finding a focused area with ongoing research was used, leading to the selection of alcohol recovery, as alcoholism is considered a disease, and substance abuse. This dissertation has brought together available data and literature to do assessments.

Unfortunately, since the available scientific data sets are not optimized to answer the research question, the scope of the scientific findings had to be more nuanced and more carefully evaluated. Combining biological and anthropological data overcame this challenge. The goal was to present what had been found, what had not, and what should be considered in the future.

Results

In conclusion, the results show the answer to the research question is biological evidence exists that supports God's redemption. There is no other alternative that explains the results better. Other explanatory options that consider the source of biological life to be emergence or unguided processes do not provide compelling answers to why there is evidence of recovery and redemption when spiritually involved activities are present. They do not address why there is such compelling aesthetically pleasing order everywhere in nature and biological life.

Implications

Our biology responds to spiritual intervention, as seen in biological redemption. There is a transcendent reality from the hand of God all the way down to molecular biology. Where ever one looks, God is there. This is intentional, and it is discoverable by God's design. God wants to be known, and He does not hide His plans. One can take the Lord at His word, and if one calls to Him, He will tell of great and mighty things one does not know (Jer. 33:3), even about the depths of molecular biology. He will provide a transcendent context that will draw man into a more meaningful relationship with Him and awe for His ways. Man with all creation was created to prosper in the original creation as expressed in the time of Eden. After the fall, man was not optimized for this new tragic reality. Human beings were created to have a meaningful and everlasting relationship with God in Eden. Epigenetically, one could grow towards a more meaningful relationship with Him. This construct may be useful when considering future research and how one might build a research model that includes the nature of God's created order, and under what criteria biological life is optimized to exist.

Future Research

Overview Perspective

Theology is just as vital today as it always was. Knowing one's theological method and clearly communicating it to others, as Carl Henry suggests, is important. Theology can once again be viewed as the queen of science in an integrated Christocentric epistemology that embraces both supernatural and natural components. With this perspective as a basis, it is vital to keep speaking the truth of the Gospel into the prevailing issues of the day, becoming salt and light for those who do not know they are in darkness.

The impacts of the spiritual social network and the role of innovation champions is vital.

Everyone can impact our network for Christ. Since sub-networks connect, what one does in a local ecosystem community can rapidly spread to a large audience, especially in the digital age. This effect should be explored further.

Our biology responds to spiritual factors in ways that have not been explored. The example of biological redemption was discussed in this dissertation. The analysis suggests that evidence of human biological design can be analyzed, and cause and effect relationships that include religiosity factors can be measured.

Research Topics and Focus

It is recommended that future work includes doing GWAS and EWAS longitudinal research with survey questions that include religiosity questions. This would allow for the opportunity to look for the hand of God and see how it can be known in new ways. It could also explore the potential utility of using a theologically-informed approach to define design of experiments. Some of the data in this dissertation could be explored further. The UK Biobank data with the signatures shown in Figure 14 and Figure 15 for OCD, lonely, guilty, and risky behavior were mentioned, but not explored. The OCD case has a signature like ADH and alcohol metabolism. The other three cases of lonely, guilty, and risky behavior have a large number of SNPs that stand out with interesting signatures that could be investigated further. The religiosity factors in Table 11 suggested the types of published questions that could allow deeper evaluation of the spiritual and religiosity components of GWAS and EWAS data sets. This is based on questions developed by Kendler, who used them in a genetic-epidemiologic study on substance use and abuse. He notes that there is no strong correlation between religiosity and psychiatric symptoms and disorders, but the study did not look at the genetic factors for alcohol metabolism and other drugs and their relationships with spiritual practices, spiritual components for recovery,

epigenetic adaptation, and types of substance abuse exposure, including prenatal, child, adolescent, and adult.²⁶⁰

Table 11. Religiosity Factors for Future GWAS and EWAS Studies

Religiosity Factor	
1	Importance of religious beliefs
2	Frequency of church attendance
3	Consciousness of religious purpose
4	Frequency of seeking spiritual comfort
5	Frequency of private prayer
6	Dissatisfaction with spiritual life
7	Belief in God
8	Belief that God rewards and punishes
9	Belief in being “born again”
10	Literal belief in Bible

Well-funded areas of biological scientific research look at understanding the mechanisms for diseases and finding cures. This, along with the paradigm of methodological naturalism, tempers which research pursuits are selected. At times, existing research approaches and data can be leveraged as demonstrated with this dissertation. As more focused research question are defined that include religiosity factors and theologically informed insights (that leverage implicate understanding) new research initiatives will be required and the funding to back them.

This dissertation examined the genetic characteristics of alcohol metabolism and epigenetic adaptation that can amend what is coded for an individual. More can be explored about how redemptive activity functions in biology. DNA methylation was also discussed, particularly where DNMT3 creates and DNMT1 regulates epigenetic adaptation sites. The SNP RS1229984 variant changes a T to a C (T>C) and creates a new location for methylation. This process shows a molecular biology pathway to overcoming a predisposition for alcoholism, as suggested in Figure 20. This area of research is a useful area to pursue future research.

²⁶⁰ Kendler, et al., “Religion, Psychopathology, and Substance Use and Abuse: A Multimeasure, Genetic-Epidemiologic Study” *Am J Psychiatry* 154, no. 3 (March 1997).

APPENDIX

Theological Insights on Creation and God's Plan

Insights from Scripture

This section will highlight Scriptural tenets that could help formulate principles for a theology of creation. It will help inform the reader how this information can be used as a guide for developing a research framework and selecting research questions. If one understands (1) the nature of man in the Garden of Eden, (2) what took place as a result of the fall, and (3) the redemptive intent of God, one can be better prepared to take this insight to know what to look for in scientific data. Instead of just looking at cause and effect in the physical world, one can gain insight into the transcendent working of God in all levels of creation.

Since Divine Revelation is considered a viable source of truth and one that is sought after in this dissertation, it is useful and edifying to turn directly to specific Biblical pericopes and let the Living Word speak for itself. To that end, specific passages are given in their entirety to acknowledge the context within which the author was writing. Then, the principles that are trying to be applied from them are developed. Essentially, one humbly comes before the Lord and lets Him tell him or her His intentions in Scripture and tries to faithfully apply them in the endeavors being done in this work.

God's Plan in Creation

The Bible reveals to us many things about God's powerful word that does not return void, but accomplishes what the Lord desires (Is. 55:11). There are four major creative and redemptive themes that will be included in this dissertation assessment. (1) God creates and sustains the world. (2) God redeems mankind through the works of Christ. (3) God's approach to creation leaves a Divine signature in every element of His created works that point back to Him. (4) God

created man to live and prosper in a community, within a networked ecosystem. God's purposes will be established. What He decrees will come about:

Isaiah 46:9-10 Remember the former things long past, for I am God, and there is no other; I am God, and there is no one like Me, declaring the end from the beginning, and from ancient times things which have not been done, saying, 'My purpose will be established, and I will accomplish all My good pleasure.'

These ideas are assessed in detail within the Chapter 3 section Insights from Theologians Examining God's Divine , including many more Scriptural insights arranged in systematic theological threads as expressed by key theologians.

The Fall and Sin

Individuals have to acknowledge the negative impact of the fall and yet see how God provides for redemption. (1) God prevented man from being in an eternal state of sin. (2) There is physical death as a result of sin. (3) Everyone must master sin, but everyone needs Jesus to show them the way:

Genesis 3:22-24 Then the Lord God said, "Behold, the man has become like one of Us, knowing good and evil; and now, he might stretch out his hand, and take also from the tree of life, and eat, and live forever"— therefore the Lord God sent him out from the garden of Eden, to cultivate the ground from which he was taken. So He drove the man out; and at the east of the garden of Eden He stationed the cherubim and the flaming sword which turned every direction to guard the way to the tree of life.

Genesis 3:17-19 Then to Adam He said, "Because you have listened to the voice of your wife, and have eaten from the tree about which I commanded you, saying, 'You shall not eat from it'; cursed is the ground because of you; in toil you will eat of it all the days of your life. "Both thorns and thistles it shall grow for you; and you will eat the plants of the field; by the sweat of your face you will eat bread, till you return to the ground, because from it you were taken; for you are dust, and to dust you shall return."

Genesis 4:6-7 Then the Lord said to Cain, "Why are you angry? And why has your countenance [panim - face] fallen? 7 If you do well, will not your countenance be lifted up? And if you do not do well, sin [chattath] is crouching at the door; and its desire is for you, but you must master [mashal – rule, have dominion over] it."

Imago Dei: Man Created in the Image of God

The characteristics of creation reflect the intentions and purpose of God. Man is made in God's image. Biological life on day five was good. Human life on day six made all of creation very good. All of mankind is created in God's image. Even in sin, man still bears that image:

Genesis 1:26-31 Then God said, "Let Us make man in Our image (*tselem* – image, likeness), according to Our likeness; and let them rule over the fish of the sea and over the birds of the sky and over the cattle and over all the earth, and over every creeping thing that creeps on the earth." God created man in His own image, in the image of God He created him; male and female He created them. God blessed them; and God said to them, "Be fruitful and multiply, and fill the earth, and subdue it; and rule over the fish of the sea and over the birds of the sky and over every living thing that moves on the earth." Then God said, "Behold, I have given you every plant yielding seed that is on the surface of all the earth, and every tree which has fruit yielding seed; it shall be food for you; and to every beast of the earth and to every bird of the sky and to everything that moves on the earth which has life, I have given every green plant for food"; and it was so. God saw all that He had made, and behold, it was very good. And there was evening and there was morning, the sixth day.

God Knows Man Intimately

God knows everything there is to know about us. This is expressed in special ways as God relates this message to His children. He (1) formed from the dust of the earth and breathed life into mankind, (2) mankind is inscribed in the palms of God's hands, (3) God formed mankind in his mother's womb, (4) God's council stands firm, (5) individuals have been foreordained to God's purposes, and (6) God has put wisdom in the hearts of mankind:

Genesis 2:7 Then the Lord God formed (*yatsar* – form, fashion) man of dust from the ground, and breathed into his nostrils the breath of life [physical, mental, spiritual]; and man became a living being.

Isaiah 49:16 Behold, I have inscribed (*chaqaq* – cut, inscribe, decree) you on the palms of My hands. Your walls (*chomah*) are continually before Me.

Jerm. 1:5I knew you before I formed (*yatsar* – form, fashion) you in your mother's womb. Before you were born I set you apart and appointed you as my prophet to the nations.

Ps. 139:13 For You formed my inward parts; You wove me in my mother's womb.

Ps. 33:11 The counsel of the Lord stands fast forever, the thoughts of His heart to all generations.

Eph. 1:11 In whom also we were made a heritage, having been foreordained according to the purpose of Him who works all things after the counsel of His will.

Psalms 8:3-5 When I consider Your heavens, the work of Your fingers, the moon and the stars, which You have ordained; what is man that You take thought of him, and the son of man that You care for him? Yet You have made him a little lower than God (*Elohim*), and You crown (*atar* – bestow) him with glory and majesty!

Job 38:36 Who has put wisdom in the innermost being or given understanding to the mind?

Networked Together in our Community

The following passages highlight what it means to be in community as The Lord intended. One sees frequent examples of meeting together: (1) like one man, (2) together we are warm, (3) becoming one flesh, (4) teaching and learning together in a small group, (5) being together with the Holy Spirit, (6) being encouraged together by one another's faith, (7) standing firm in one spirit, (8) knit together in love, and (9) stimulate one another to love and good works:

Ezra 3:1-5 Now when the seventh month came, and the sons of Israel were in the cities, the people gathered together as one man to Jerusalem. Then Jeshua the son of Jozadak and his brothers the priests, and Zerubbabel the son of Shealtiel and his brothers arose and built the altar of the God of Israel to offer burnt offerings on it, as it is written in the law of Moses, the man of God. So they set up the altar on its foundation, for they were terrified because of the peoples of the lands; and they offered burnt offerings on it to the Lord, burnt offerings morning and evening. They celebrated the Feast of Booths, as it is written, and offered the fixed number of burnt offerings daily, according to the ordinance, as each day required; and afterward there was a continual burnt offering, also for the new moons and for all the fixed festivals of the Lord that were consecrated, and from everyone who offered a freewill offering to the Lord.

Ecclesiastes 4:11 Furthermore, if two lie down together they keep warm, but how can one be warm alone?

Mark 10:2-9 Some Pharisees came up to Jesus, testing Him, and began to question Him whether it was lawful for a man to divorce a wife. And He answered and said to them, "What did Moses command you?" They said, "Moses permitted a man to write a certificate of divorce and send her away." But Jesus said to them, "Because of your hardness of heart he wrote you this commandment. But from the beginning of creation,

God made them male and female. For this reason a man shall leave his father and mother, and the two shall become one flesh; so they are no longer two, but one flesh. What therefore God has joined together, let no man separate.”

Luke 9:1-2 And He called the twelve together, and gave them power and authority over all the demons and to heal diseases. And He sent them out to proclaim the kingdom of God and to perform healing.

Acts 1:4-5 Gathering them together, He commanded them not to leave Jerusalem, but to wait for what the Father had promised, “Which,” He said, “you heard of from Me; for John baptized with water, but you will be baptized with the Holy Spirit not many days from now.”

Romans 1:11-12 For I long to see you so that I may impart some spiritual gift to you, that you may be established; that is, that I may be encouraged together with you while among you, each of us by the other’s faith, both yours and mine.

Philippians 1:27-28 Only conduct yourselves in a manner worthy of the gospel of Christ, so that whether I come and see you or remain absent, I will hear of you that you are standing firm in one spirit, with one mind striving together for the faith of the gospel; in no way alarmed by your opponents—which is a sign of destruction for them, but of salvation for you, and that too, from God.

Colossians 2:1-3 For I want you to know how great a struggle I have on your behalf and for those who are at Laodicea, and for all those who have not personally seen my face, that their hearts may be encouraged, having been knit together in love, and attaining to all the wealth that comes from the full assurance of understanding, resulting in a true knowledge of God’s mystery, that is, Christ Himself, in whom are hidden all the treasures of wisdom and knowledge.

Hebrews 10:23-25 Let us hold fast the confession of our hope without wavering, for He who promised is faithful; and let us consider how to stimulate one another to love and good deeds, not forsaking our own assembling together, as is the habit of some, but encouraging one another; and all the more as you see the day drawing near.

Sobriety: Having a Sober Spirit

Paul points out in his church letters how believers are called not to get drunk with wine, or to live a life of drunkenness:

Ephesians 5:15-21 Therefore be careful how you walk, not as unwise men but as wise, making the most of your time, because the days are evil. So then do not be foolish, but understand what the will of the Lord is. And do not get drunk with wine, for that is dissipation, but be filled with the Spirit, speaking to one another in psalms and hymns and spiritual songs, singing and making melody with your heart to the Lord; always

giving thanks for all things in the name of our Lord Jesus Christ to God, even the Father; and be subject to one another in the fear of Christ.

Galatians 5:18-23 But if you are led by the Spirit, you are not under the Law. Now the deeds of the flesh are evident, which are: immorality, impurity, sensuality, idolatry, sorcery, enmities, strife, jealousy, outbursts of anger, disputes, dissensions, factions, envying, drunkenness, carousing, and things like these, of which I forewarn you, just as I have forewarned you, that those who practice such things will not inherit the kingdom of God. But the fruit of the Spirit is love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control; against such things there is no law.

Peter points out how those in Christ are called to have a sober spirit. Not being sober, whether it be alcohol abuse, substance abuse, or some other mind-altering experience, moves one's spiritual focus away from being aligned with the Holy Spirit, setting his or her focus on the flesh and the things of the world which are not of God:

1 Peter 5:6-9 Therefore humble yourselves under the mighty hand of God, that He may exalt you at the proper time, casting all your anxiety on Him, because He cares for you. Be of sober spirit, be on the alert. Your adversary, the devil, prowls around like a roaring lion, seeking someone to devour. But resist him, firm in your faith, knowing that the same experiences of suffering are being accomplished by your brethren who are in the world.

People have an important reminder that they are the temples of the Holy Spirit, and they should keep their bodies holy:

1 Corinthians 3:16-17 Do you not know that you are a temple of God and that the Spirit of God dwells in you? If any man destroys the temple of God, God will destroy him, for the temple of God is holy, and that is what you are.

In Proverbs, people are reminded of the importance of hold good company and not associate with heavy drinkers:

Proverbs 23:20-33 Do not be with heavy drinkers of wine, or with gluttonous eaters of meat; for the heavy drinker and the glutton will come to poverty, and drowsiness will clothe one with rags. Listen to your father who begot you, and do not despise your mother when she is old. Buy truth, and do not sell it, get wisdom and instruction and understanding. The father of the righteous will greatly rejoice, and he who sires a wise son will be glad in him. Let your father and your mother be glad, and let her rejoice who gave birth to you. Give me your heart, my son, and let your eyes delight in my ways. For a harlot is a deep pit and an adulterous woman is a narrow well. Surely she lurks as a

robber, and increases the faithless among men. Who has woe? Who has sorrow? Who has contentions? Who has complaining? Who has wounds without cause? Who has redness of eyes? Those who linger long over wine, Those who go to taste mixed wine. Do not look on the wine when it is red, when it sparkles in the cup, when it goes down smoothly; at the last it bites like a serpent and stings like a viper. Your eyes will see strange things and your mind will utter perverse things.

Proverbs 20:1 Wine is a mocker, strong drink a brawler, and whoever is intoxicated by it is not wise.

Under no circumstance is one to be a hero in drinking; this goes against what one is called to be:

Isaiah 5:20-23 Woe to those who call evil good, and good evil; who substitute darkness for light and light for darkness; who substitute bitter for sweet and sweet for bitter! Woe to those who are wise in their own eyes and clever in their own sight! Woe to those who are heroes in drinking wine and valiant men in mixing strong drink, who justify the wicked for a bribe, and take away the rights of the ones who are in the right!

Leviticus 10:8-11 The Lord then spoke to Aaron, saying, “Do not drink wine or strong drink, neither you nor your sons with you, when you come into the tent of meeting, so that you will not die—it is a perpetual statute throughout your generations— and so as to make a distinction between the holy and the profane, and between the unclean and the clean, and so as to teach the sons of Israel all the statutes which the Lord has spoken to them through Moses.”

Numbers 6:1-4 Again the Lord spoke to Moses, saying, “Speak to the sons of Israel and say to them, ‘When a man or woman makes a special vow, the vow of a Nazirite, to dedicate himself to the Lord, he shall abstain from wine and strong drink; he shall drink no vinegar, whether made from wine or strong drink, nor shall he drink any grape juice nor eat fresh or dried grapes. All the days of his separation he shall not eat anything that is produced by the grape vine, from the seeds even to the skin.

Genesis 9:20-24 Then Noah began farming and planted a vineyard. He drank of the wine and became drunk, and uncovered himself inside his tent. Ham, the father of Canaan, saw the nakedness of his father, and told his two brothers outside. But Shem and Japheth took a garment and laid it upon both their shoulders and walked backward and covered the nakedness of their father; and their faces were turned away, so that they did not see their father’s nakedness. When Noah awoke from his wine, he knew what his youngest son had done to him.

Proverbs 31:4-7 It is not for kings, O Lemuel, it is not for kings to drink wine, or for rulers to desire strong drink, for they will drink and forget what is decreed, and pervert the rights of all the afflicted. Give strong drink to him who is perishing, and wine to him

whose life is bitter. Let him drink and forget his poverty and remember his trouble no more.

Luke 1:13-16 But the angel said to him, “Do not be afraid, Zacharias, for your petition has been heard, and your wife Elizabeth will bear you a son, and you will give him the name John. You will have joy and gladness, and many will rejoice at his birth. For he will be great in the sight of the Lord; and he will drink no wine or liquor, and he will be filled with the Holy Spirit while yet in his mother’s womb. And he will turn many of the sons of Israel back to the Lord their God.

Genesis 19:30-32 Lot went up from Zoar, and stayed in the mountains, and his two daughters with him; for he was afraid to stay in Zoar; and he stayed in a cave, he and his two daughters. Then the firstborn said to the younger, “Our father is old, and there is not a man on earth to come in to us after the manner of the earth. Come, let us make our father drink wine, and let us lie with him that we may preserve our family through our father.”

Redemption

God has redeemed His people. By the works of Christ and His precious blood on the cross, people can restore their relationship with God.

1 Corinthians 6:19-20 Or do you not know that your body is a temple of the Holy Spirit who is in you, whom you have from God, and that you are not your own? For you have been bought with a price: therefore glorify God in your body.

Ephesians 1:7-9 In Him we have redemption through His blood, the forgiveness of our trespasses, according to the riches of His grace which He lavished on us. In all wisdom and insight He made known to us the mystery of His will, according to His kind intention which He purposed in Him.

1 Peter 1:17-19 If you address as Father the One who impartially judges according to each one’s work, conduct yourselves in fear during the time of your stay on earth; knowing that you were not redeemed with perishable things like silver or gold from your futile way of life inherited from your forefathers, but with precious blood, as of a lamb unblemished and spotless, the blood of Christ.

Revelation 5:9-10 And they sang a new song, saying, “Worthy are You to take the book and to break its seals; for You were slain, and purchased for God with Your blood men from every tribe and tongue and people and nation. You have made them to be a kingdom and priests to our God; and they will reign upon the earth.”

Insights from Theologians Examining God's Divine Plan

This section will examine what one can know about the nature of God's plan. Some theological positions tend to call this the divine decree. It is not the intent to dogmatically express a particular theological position since so many other topics are covered in this dissertation. This section will try to reflect what each theologian thinks about this issue. God's plan could be considered the Biblical rendering of this topic, and a divine decree could be a theological rendering of the topic with a specific theological perspective.

God spoke, and life came into existence. He proceeded in an authoritative yet elegant way to create the heavens and the earth. This creative act did not start and stop with the creation week. His creative power and signature can be found everywhere one looks. Plus, there is a connection between creation and the new creation one experiences as a Christian. Christ became flesh and dwelt among mankind. God created the world. Jesus came to redeem the world. So, amid God engaging with the world, there are major creative and redemptive themes that are accessible to His children: (1) God created and sustains the world. (2) God redeemed mankind through the works of Christ. (3) God's approach to creation leaves a divine signature in every element of His created works that point back to Him.

There are divine signatures that have been left for mankind to discover, and there are interesting connections between God and time. With so much divinely created diversity, it can be challenging to determine which aspect to look at further. The motivation for creating this section and a desired focus area that will leverage this work is examining further the nature of biological life. DNA provides coding instructions, and the more it is studied, the more evidence exists that it is designed and did not evolve. Cellular function shows multiple layers of design and complexity.

Beside biological life, there is the awe one experiences when looking at the heavens. There is clear and immediate access to the solar system, our galaxy, and the universe when one gazes up at night and then looks farther with various scientific instruments mankind has created to aid his searching. Plus, visible geological wonders show other areas of useful evidence of the nature of our world. The Grand Canyon is a rich geological environment that provides evidence that can support an alternative view of natural and human history that aligns with the Biblical account of the flood.

God and His Creation

God created the heavens and the earth. There is a tight coupling between God and His creation. There is evidence of God's divine nature in creation. Man cannot see God, but he can experience His creation. God has provided discoverable qualities within creation that He wants man to find. Romans 1:20 states, "For since the creation of the world His invisible attributes, His eternal power and divine nature, have been clearly seen, being understood through what has been made, so that they are without excuse." God wants His children to know about Him. He created the heavens and the earth with beauty and harmony. Mankind can explore all these things. By studying nature, mankind can see evidence of what took place in the past. By examining biological processes, one can discern how some things work and extrapolate theories for what will happen in the future.

Biblical Support for God's Plan

The immutable attribute of God captured by the term the Divine decree embodies the concept that God that with His infinite power can create out of nothing with His word, cause a chain reaction of events and processes to accomplish His purposes, and leave discoverable signatures for mankind to uncover.

The Biblical Basis for the Divine Decree - Shedd

God's decree can be characterized in general by a few key passages. All things come about according to His will.

- Eph. 1:11 In whom also we were made a heritage, having been foreordained according to the purpose of Him who works all things after the counsel of His will.
- Ps. 33:11 The counsel of the Lord stands fast forever, the thoughts of His heart to all generations.
- Isa. 46:10 Declaring the end from the beginning, and from ancient times things that are not yet done; saying, my counsel shall stand, and I will do all my pleasure.

There is a variety of passages that show how God formed mankind and knew in advance who his Children would be. People are formed because of God's decree.

- Jerm. 1:5 I knew you before I formed you in your mother's womb. Before you were born I set you apart and appointed you as my prophet to the nations.
- Ps. 139: 13 For You formed my inward parts; You wove me in my mother's womb.
- Is 47:16 Behold, I have inscribed you on the palms of My hands; Your walls are continually before Me.

Shedd captures thematically a variety of Scripture verses about the divine decree. He claims that it can be characterized by several factors: (1) founded in wisdom, (2) eternal, (3) universal, and (4) immutable.

- The Divine decree is founded in wisdom
 - God saw everything He had made, and it was good (Gen. 1:31)
 - Counsel of the Lord stands forever (Ps. 33:11)
 - The counsel of the Lord will stand (Prov. 19:21)
 - He has counsel and understanding (Job. 12:13)
 - According to the counsel of His will (Eph. 1:11)
 - He has done all things well (Mark 7:37)
- The Divine decree is eternal
 - The kingdom was prepared from the foundation of the world (Matt. 25:34)
 - Known unto God are all His works from the beginning (Acts 15:18)
 - He has chosen us before the foundation of the world (Eph. 1:4)
 - God since the begin chose you for salvation (2 Thess. 2:13, 2 Tim. 1:9, 1 Cor. 2:7)
 - Christ as a sacrifice was foreordained before the foundation of the world (1 Pet. 1:20)
 - Lamb was slain from the beginning of the world (Rev. 13:8)
- The Divine decree is universal

- Known unto God are all His works from the beginning (Acts 15:18, Prov. 16:33)
- He works all things after the counsel of His own will (Eph. 1:10-11, Dan. 4:34-35, Matt. 10:29-30, Acts 17:26, Job 14:5, Is. 46:10)
- The Divine decree is immutable
 - He is of one mind and no one can turn Him (Job 23:13)
 - My counsel shall stand, and I will do all my pleasure (Isa 46:10)²⁶¹

Theological Support for God's Plan

Authority – Carl Henry

Henry deals with the divine decree by addressing divine disclosure, the relationship of creation and revelation, and how everything happens according to God's sovereign decree. First, God chooses to reveal Himself as He invokes his divine decree:

The inaccessibility or accessibility of the Divine is, moreover, far more than simply a matter of God's decree. The very nature of divine reality and truth are such that, apart from divine initiative and disclosure, they remain intrinsically hidden. The God of the Bible is wholly determinative in respect to revelation. He is free either to reveal himself or not to reveal himself; he is sovereign in his self-disclosure. In addressing the Corinthians Paul reminds them that "no one knows the thoughts of God except the Spirit of God" and that the divine Spirit is instrumental in the communication of God's revelation (1 Cor. 2: 10, 11, NIV). The Epistle to the Hebrews speaks of specific "times" of God's progressive revelation (Heb. 1: 1– 3). In his letter to the Colossians Paul emphasizes that the deep content of God's special disclosure remained hidden at various stages until the chosen moment of God's active revelation (Col. 2: 2– 3).²⁶²

God created the heavens and the earth. He wants man to respond to His word and decree.

Thus, secondly, there is a connection between creation, revelation, and inspiration:

The Triune God, who formed all things by His creative utterances and governs all things by His Word of decree, made mankind in His own image for a life of communion with Himself, on the model of the eternal fellowship of living communication within the Godhead. As God's image-bearer, man was to hear God's Word addressed to him and to respond in the joy of adoring obedience. Over and above God's self-disclosure in the created order and the sequence of events within it, human beings from Adam on have

²⁶¹ William Shedd, *Dogmatic Theology*, ed. Alan W. Gomes, 3rd ed. (Phillipsburg, NJ: P & R Pub., 2003), 314-316.

²⁶² Carl Henry, *God, Revelation and Authority* (Wheaton, IL: Crossway, 1999), vol. 2, 18-19.

received verbal messages from Him, either directly, as stated in Scripture, or indirectly in the form of part or all of Scripture itself.²⁶³

Thirdly, Henry suggests that everything emerges from God's sovereign decree.

Everything can be traced back to Him. The universe came together in direct response to what God called forth to happen by His word:

Scripture speaks of divine decrees in more than merely a theoretical or speculative way by exhibiting their external implications and consequences for the history of the ancient Hebrews and for the existence of the Christian church. In biblical theology everything that God does is the outworking of his sovereign decree. In this respect man is no different from the stars or from the sands of the sea; that humans stand at a definite place in history is no more an accident than that the planets move in their orbits and that the nations have their given bounds. The Bible depicts divine predestination, moreover, as involving more than simply a temporal and historical election. What the Bible affirms is God's pretemporal, superhistorical eternal election. The universe is not just the result of an unforeseen big bang but has come into being by contingent necessity. Its existence is suspended on the eternal plan of the unchanging God who is free to decree as he pleases and who in his "good pleasure" decrees a space-time matrix that by his willing becomes as necessary as is God himself.²⁶⁴

There is an order to God's decree. Out of His self-knowledge He formulates His decrees.

Out of His decrees, through His will, actions come to pass:

God's decree is preceded logically by his intrinsic self-knowledge, unless it be the case that his decree and his self-knowledge are identical or that the decree is part of his self-knowledge. God's decree precedes all else, since the external universe is itself God's implementation of his purpose. The divine decree is not, however, identical with the external events, since God's thoughts become creative only through an act of divine will. God creates neither by logical nor volitional nor external necessity; he was free not to decree a universe. The God who decrees from eternity remains free in that he himself is unecessitated by any external causal principle; his compulsion to decree is entirely a matter of internal self-determination. But this internal compulsion does not govern God's productive activity as a kind of deterministic divine causality. Although God had sufficient reason for creating the present universe, he might indeed have created a different one, or even two or more dissimilar universes. The bottom line for Christianity

²⁶³ Carl Henry, *God, Revelation and Authority*, vol. 4, 217-218.

²⁶⁴ Carl Henry, *God, Revelation and Authority*, vol. 6, 79-80.

is always that God's decrees imply no limitation on his powers; moreover, the transcendent God's freedom is what accounts for space-time realities.²⁶⁵

Attributes of God and His Decree - Pink

Pink explores four basic properties of divine decrees: (1) they are eternal, (2) they are wise, (3) they are free, and (4) they are absolute and unconditional. First, Pink points out that all of God's decrees are eternal and God created them outside of time:

To suppose any of them to be made in time is to suppose that some new occasion has occurred; some unforeseen event or combination of circumstances has arisen, which has induced the Most High to form a new resolution. This would argue that the knowledge of the Deity is limited, and that He is growing wiser in the progress of time—which would be horrible blasphemy. No man who believes that the divine understanding is infinite, comprehending the past, the present, and the future, will ever assent to the erroneous doctrine of temporal decrees. God is not ignorant of future events which will be executed by human volitions; He has foretold them in innumerable instances, and prophecy is but the manifestation of His eternal prescience. Scripture affirms that believers were chosen in Christ before the world began (Eph 1:4), yea, that grace was “given” to them then (II Tim 1:9).²⁶⁶

Secondly, Pink argues the decrees of God are wise. This is shown in that the best of possible outcomes will ultimately come forth:

Wisdom is shown in the selection of the best possible ends and of the fittest means of accomplishing them. That this character belongs to the decrees of God is evident from what we know of them. They are disclosed to us by their execution, and every proof of wisdom in the works of God is a proof of the wisdom of the plan, in conformity to which they are performed. As the Psalmist declared, “O LORD, how manifold are Thy works! in wisdom hast Thou made them all” (104:24). It is indeed but a very small part of them which falls under our observation, yet, we ought to proceed here as we do in other cases, and judge of the whole by the specimen, of what is unknown, by what is known. He who perceives the workings of admirable skill in the parts of a machine which he has an opportunity to examine, is naturally led to believe that the other parts are equally admirable. In like manner we should satisfy our minds as to God's works when doubts obtrude themselves upon us, and repel any objections that may be suggested by something that we cannot reconcile to our notions of what is good and wise. When we reach the bounds of the finite and gaze toward the mysterious realm of the infinite, let us

²⁶⁵ Ibid.

²⁶⁶ A. W. Pink, *Attributes of God* (Pensacola, FL: Chapel Library, 1993), 5.

exclaim, “O the depth of the riches both of the wisdom and knowledge of God!” (Rom 11:33).²⁶⁷

Thirdly, Pink argues that all of God’s decrees are free. He made them solely upon His will and purpose; He was not compelled by any outside force:

“Who hath directed the Spirit of the LORD, or being His counselor hath taught Him? With whom took He counsel, and who instructed Him, and taught Him in the path of judgment, and taught Him knowledge, and shewed to Him the way of understanding?” (Isa 40:13-14). God was alone when He made His decrees, and His determinations were influenced by no external cause. He was free to decree or not to decree, and to decree one thing and not another. This liberty we must ascribe to Him who is Supreme, Independent, and Sovereign in all His doings.²⁶⁸

Fourthly, Pink argues God’s decrees are absolute and unconditional. There is nothing human beings can do that can prevent them from coming to pass.

The execution of them is not suspended upon any condition which may, or may not be, performed. In every instance where God has decreed an end, He has also decreed every means to that end. The One who decreed the salvation of His elect also decreed to work faith in them (II Thess 2:13). “My counsel shall stand, and I will do all My pleasure” (Isa 46:10): but that could not be, if His counsel depended upon a condition which might not be performed. But God “worketh all things after the counsel of His own will” (Eph 1:11).²⁶⁹

Support for the Divine Decree - Feinberg

Feinberg finds plenty of Scriptural evidence in the Old Testament that supports the divine decree. God actively engages in the affairs of individuals and the nation of Israel:

Is There a Divine Decree? The OT contains many passages that teach God’s control over this world’s affairs. Moreover, some passages say he made a plan long ago and will carry it out. Several passages in Psalms are a good place to begin. In Ps 103: 19 David claims that God has established his throne in heaven and rules over all. In Ps 115: 3 the psalmist contrasts pagan gods with Israel’s God. He says, “Our God is in the heavens; He does whatever He pleases.” Again in Psalm 135 Israel’s God is compared to idols. The psalmist says, “Whatever the LORD pleases, He does, in heaven and in earth, in the seas and in all deeps” (v. 6). Likewise, after his trials and confrontation with God, Job says

²⁶⁷ Ibid.

²⁶⁸ Ibid.

²⁶⁹ Ibid.

(Job 42: 2) “I know that Thou canst do all things, and that no purpose of Thine can be thwarted.” Job received such a vision of God’s majesty and grandeur that he realized that it is foolish amid trials to wonder if God is in control or if he can help us. God can do whatever he wants, and if he decides to do something, nothing can stop him.²⁷⁰

Concerning the characteristics of the divine decree, Feinberg summarizes the major characteristics of the divine decree that he sees being highlighted in Scripture:

- The decree is founded in God’s wisdom
- God’s decree is eternal
- God’s plans were made in eternity past
- There is an ultimate purpose of God’s plan
- God’s decree is efficacious
- God’s decree is all-comprehensive
- God’s decree is based on his desires and purposes²⁷¹

God, Time, and the Divine Decree - Frame

Although not extensively discussed in this section, the relationship of God and time is an interesting topic. There is some debate on this front. Frame holds that God, in a sense, can be temporal and atemporal. This has an impact on the divine decree. God can operate above time, and thus transcend temporal limitations in specifying what will come to pass:

But God’s temporal immanence does not contradict his lordship over time or the exhaustiveness of his decree. These temporal categories are merely aspects of God's general transcendence and immanence as the Lord. The give-and-take between God and the creation requires, not it reduced, but an enhanced, view of his sovereignty. God is the Lord in time as well as the Lord above time. So God is temporal after all, but not merely temporal. He really exists in time, but he also transcends time in such a way as to exist outside it. He is both inside and outside of the temporal box—a box that can neither confine him nor keep him out. This is the model that does the most justice to the biblical data.²⁷²

²⁷⁰ John Feinberg, *No One Like Him: The Doctrine of God* (Crossway 2006), 481.

²⁷¹ *Ibid.*, 485-488.

²⁷² John Frame. *The Doctrine of God* (Phillipsburg: Presbyterian and Reformed, 2002), 559.

Metaphysical Significance of God's Plan

God's Plan and Matter - Dembski

What is the relationship between the God's plan and matter? If matter were the most basic form of reality (from a naturalistic point of view), this would not come up. But if one assumes that information is more fundamental than matter, it would be necessary to conceive a plan of how to form this matter into specific material objects. This plan would contain information. When this information is transformed into matter (and communicated in some manner) a second action takes place. Dembski develops this idea and considers it a double creation. First, something is created as an idea and conveyed via information. Then, it is created a second time when it is formed into matter. Plato, Aristotle, and others have also written about this concept.²⁷³ Finding a more comprehensive way of including the nature and place of information in scientific exploration may be vital when faced with the incredible amounts of data being uncovered in genomics. Dembski argues for information being more fundamental than matter:

What does the world look like if the fundamental stuff of reality is not matter but information? ... We live in an information age. Yet we also live in an overwhelmingly materialist age in which the things that seem to us most solid and inspire the most confidence are material. Information itself therefore tends to be conceived in material terms, as a property of matter. But what if information cannot be reduced to matter? To turn the tables even more sharply, what if matter itself is an expression of information? ... The natural sciences, as practiced in our day, attempt to understand the world in terms of their material properties, leaving no remainder for anything nonmaterial.²⁷⁴

²⁷³ William Dembski, *Being as Communion* (Burlington, VT: Ashgate Publishing, 2014), 193-194.

²⁷⁴ William Dembski, *Being as Communion*, 1-3.

Helm supports the point of view that God is outside of time. This perspective provides insight into how the divine decree is executive:

And for such a timeless God to sustain the universe over a period of time, say from Monday to Friday, is simply for God timelessly to decree that the universe created has duration for that period. 'Sustain' here does not mean, as it does for some theists, 'create anew', nor does it mean to extend what is in existence at a time by a new act at that time (for that would reintroduce the idea of God being in time), it means rather that God has timelessly decreed that the universe shall develop, unfold, or continue at least until now, this stage in its development, the stage it has reached, say by 1988. Or, alternatively, that God has timelessly decreed that the universe has a 1988 stage. Whether it will continue to develop and whether God has decreed timelessly a post-1988 stage is presumably not something that can be determined a priori, but must wait upon experience. Perhaps this is what Augustine means when in his *Confessions* he writes of the universe being created by God not in time, but with time.²⁷⁵

Helm goes on to argue there is a single, unitary, eternal Divine plan. God's word goes forth and accomplishes what He desires:

To some, the idea of a unitary eternal divine decree by which all that God produces in time he decrees to produce may conjure up the spectre of Leibnizianism or of monisms of an even more rigid, monocausal kind. It may suggest the doctrine of internal relations, of world-bound individuals and the like. But such fears are without foundation, as will be seen in the later discussion of divine freedom. Such a view as we have been sketching is compatible with Leibnizianism, just as it is compatible with an ontology which distinguishes between individual essential and individual accidental properties, and a Hume-like ontology of radical causal contingency.²⁷⁶

Ultimately, Helm concludes that Christian theism best matches the causal and logical relations of God:

It is more satisfactory to argue that according to the Christian theistic view being defended the causal and logical relations of God to his created universe cannot readily be separated. For according to this view God's timeless decree that B occur at t_2 , say, cannot be taken in isolation from God's timeless decree of A at t_1 , and any causal links that there may be between these events. In short what God timelessly decrees is a complete causal matrix of events and actions. So timeless creation entails determinism. And if so, it has

²⁷⁵ Paul Helm. *Eternal God: A Study of God without Time*, 71.

²⁷⁶ *Ibid.*, 72.

been argued in this chapter, the fact of the ordination of the causal sequence carries no more adverse consequences for human responsibility than determinism simpliciter carries.²⁷⁷

Creation

Creation is a direct result of the Divine decree. God created space and time, and then put matter into it. Out of that matter, He created life and populated the cosmos. These display the beauty of God. With the far reach of the cosmos, most of the heavens will never be seen by mankind with our scientific exploration in this life. Still God made it all.

Ex Nihilo – Speaking into Existence Out of Nothing

The best argument for how the heavens and the earth came about is the argument that creation came about by God *ex nihilo*, out of nothing. Before time, space, and matter were created, there was nothing to construct from. These were all created by God. Shedd articulates this idea as follows:

Creation, in the proper sense of origination *ex nihilo*, is the very first work that God does *ad extra*. Nothing precedes it, except that eternal activity in the divine essence which results in the trinitarian persons. These latter are not creations, but emanations. Hence creation is called “the beginning of God’s way” (Prov. 8:22); and God is said to have created the heaven and earth “in the beginning” (Gen. 1:1). The doctrine of creation is taught in Gen. 1:1; Neh. 9:6; Job 26:3; Ps. 19:1; 104:30; 124:8; 146:6; John 1:3; Acts 17:24; Rom. 11:36; 1 Cor. 8:6; 2 Cor. 4:6; Col. 1:16; Heb. 3:4; 4:4; 11:3. The peculiar characteristic in creation, namely, the origination of entity from nonentity, is mentioned in the following: “The worlds were framed so that things which are seen were not made of things that do appear” (Heb. 11:3); “God commanded the light to shine out of darkness” (2 Cor. 4:6); and “by him were all things created, visible and invisible” (Col. 1:16). Creation *ex nihilo* is peculiar to the Scriptures. It is not found even in the most rational and spiritual of the ancient cosmogonies. Even when an intelligent architect of the universe is affirmed, as in the systems of Plato and Aristotle, an eternal *hylē*,¹ or chaotic matter, is postulated, out of which it is formed. Philo (*On the World*) takes the same view. In the Platonic writings, God is rather a demiurge than a Creator. Plutarch (*Procreation of the Soul*) describes Plato’s view as follows: “The creation was not out of nothing, but out of matter wanting beauty and perfection, like the rude materials of a house lying first in a confused heap.”²⁷⁸

²⁷⁷ Ibid., 170.

²⁷⁸ William Shedd, *Dogmatic Theology*, ed. Alan W. Gomes, 3rd ed., 366.

God Saw That It Was Good

Not only did God create the heavens and the earth out of nothing, but He also saw that it was good. God was proud of His creation, and He saw the beauty it reflected. All the heavens and the earth declare the glory of God. They show His amazing beauty and causes a reaction in man as he experiences it. Man has a sense of awe and are humbled in its presence.

Evidence in Nature for God’s Plan and Creation

Biology: Complex Polymorphic Utilization of Genomic Information in the Cell

Many see the strong evidence of design in biological life that points to God. For example, Sanford points out how one signature in the cell is the complexity found with overlapping codes where the same information in DNA is used multiple times in different ways:

There is now strong evidence that within any given stretch of genomic DNA, there are multiple overlapping messages. This is a little like getting an email, reading useful information from it, and then discovering that part of it, when read backwards had another useful message, and when reading every-other-letter in another part provides a third overlapping message with useful information. We now know that over half the human genome is read backwards as well as forwards. A given gene produces roughly 7 overlapping transcripts, having different start and stop positions. The resulting transcripts are then differentially-spliced, such that any given transcript can give rise to many possible proteins. We have shown that these types of overlapping codes profoundly affect the probability of mutations arising that are truly beneficial. Most “beneficial” mutations, while they may improve one message, will disrupt one or more overlapping messages. Such mutations are not truly beneficial but are at best ambiguously beneficial. In this light, biologists must adjust their estimated rates of truly beneficial mutations downward very dramatically (Montañez et al., 2013). Mutations that are both unambiguously beneficial and also impactful enough to be selectable, must be vanishingly rare.²⁷⁹

Geology: Evidence of the Flood and Agreement with the Biblical Record

There is ongoing scholarship that not only believes the Biblical record but also looks at the geological evidence and examines how the summary narrative in places like Genesis is

²⁷⁹ John Sanford, *Genetic Entropy* (FMS Publications, 2015), 182-183.

visibly still discernable in places like the Grand Canyon. Boyd and Snelling are good examples of such scholars since they take seriously what the Genesis account says and then diligently seek how the scientific evidence supports it. There is credible evidence that there was a worldwide flood. All the rock strata, fossil records, and various other evidence can be shown to align with a sudden worldwide cataclysmic event. As is suggested in other parts of this section, the process is to take advantage of Divine revelation and then use it to help interpret findings and guide in potential areas to research further.²⁸⁰

Boyd and Snelling look in detail at the chronology of the Flood and the implications of how the Bible and science should work closely together. They firmly conclude that Scripture should be used as the ultimate guide and the tool by which one should frame his or her exploration of nature. From this starting point, one can create scientific models to gain insight into the Flood and the in a larger sense geology, geophysics, and paleontology as seen below:

Scripture informs and guides our understanding of the earth's geology, geophysics, and paleontology. Scientific investigations continue to uncover myriads of details that need systematizing into an overall scheme which pieces together the progressive building of today's continents with their fossil-bearing sedimentary layers and their landscapes. The Flood event provides such an overarching scheme or model. The fossil-bearing rock layers are stacked in catalogued sequences that have been matched from region to region across continents and between continents into the so-called geologic column. Its reality provides the record of the outcomes of the Flood event. The model of a pre-Flood supercontinent being catastrophically broken up and the fragments sprinting across the globe to become today's continents, as proposed by Antonio Snider-Pellegrini in 1859, has been further developed into the catastrophic plate tectonics model of Steve Austin et al. in 1994.²⁸¹

²⁸⁰ Steven Boyd and Andrew Snelling, *Grappling with the Chronology of the Genesis Flood* (Green Forest, AR: Master Books, 2014).

²⁸¹ *Ibid.*, 21.

Astronomy and Cosmology: Testament of Origins and Laws of Nature

What would happen if an objective scientist was to look at the astronomical and cosmological data and let the results lead him or her to formulate a theory that embraces all the evidence, not matter what it might conclude? Anthony Flew is a good example of this. He was a staunch atheist for most of his life. Yet, what he could not avoid since he was an open-minded scientist was what the implications of astronomy and cosmology were leading him to. As a result, he came to the following opinion as he was confronted by the totality of the facts:

Although I was once sharply critical of the argument to design, I have since come to see that, when correctly formulated, this argument [who wrote the laws of nature] constitutes a persuasive case for the existence of God. Developments in two areas in particular have led me to this conclusion. The first is the question of the origin of the laws of nature and the related insights of eminent modern scientists. The second is the question of the origin of life and reproduction.²⁸²

As he then looked at his use of the scientific method, he made discoveries whose answers could not be quantified by the physical world. Thus, he decided to employ theological method to his work:

Science qua science cannot furnish an argument for God's existence. But the three items of evidence we have considered in this volume—the laws of nature, life with its teleological organization, and the existence of the universe—can only be explained in the light of an Intelligence that explains both its own existence and that of the world. Such a discovery of the Divine does not come through experiments and equations, but through an understanding of the structures they unveil and map.²⁸³

²⁸² Anthony Flew, *There is a God* (New York, NY: Harper Collins, 2009), 95.

²⁸³ *Ibid.*, 155.

Implications

(1) Harmony

(1A) God's Plan Anticipates Divine Disclosure

Henry notes how God saw in advance where He wanted the divine decree to go. He had a plan, in advance of creation, that He could conceive in a way that goes beyond all human comprehension:

But God's decree to create the universe already anticipated divine disclosure correlated with human understanding and speech and communication. It is man that God created as capstone of his creation and human nature that he destined for special participation in his plan.²⁸⁴

(1B) There is Purpose in God's Plan and Disclosure

God was intentional in what He created. Every new thing man uncovers in the created order represents yet another thing He planted for man to discover:

He is the God who decrees and elects from eternity, who creates ex nihilo, who works out his purposes in nature and history. He is the God who pledges and provides redemption in Christ Jesus, the Nazarene who as King of Israel not only fulfills the divine election and calling of his people but also grafts upon them the Gentiles. He is the God who will subordinate all things to his righteous, everlasting rule.²⁸⁵

(1C) Harmony of the Biblical Creation Account with Physical Science

Shedd, like many other conservative theologians and Christian scientists, sees how theology and science can work together elegantly. One can harmonize them if he or she understands the nature of each discipline and integrates them in the proper way. Shedd considers how science is fallible, and raising it up to the level of dogma will result in mistakes and an overreaching of potentially faulty scientific reasoning. Science cannot dictate to theology. The

²⁸⁴ Carl Henry, *God, Revelation and Authority*, vol. 2, 31-32.

²⁸⁵ *Ibid.*, vol. 2, 75-76.

changeable realm of science should never force the unchangeable truth of Divine revelation to move:

Respecting the harmony between physical science and revelation, it is to be observed in the first place that physical science is not infallible, so that an actual conflict between science and revelation would not necessarily be fatal to revelation. It might be fatal to science. In the seventeenth century the physics of Descartes had great authority, and much was made by the skeptics of that day of the fact that the Mosaic physics did not square with the Cartesian physics. Says Howe (*Oracles* 2.21), "Some are sick of the history of the creation, because they cannot reconcile the literal account thereof, in the beginning of Genesis, with the philosophy of their Descartes: as if his reputation were a thing more studiously to be preserved than that of Moses; though yet, more might be said than has been, to reconcile with natural principles even the whole history of the creation." The "vortices" of the Cartesian physics are today an exploded and rejected "science"; and the most skeptical physicist of this generation would not dream of alleging a conflict between science and religion because Moses does not agree with Descartes. Again, in the second place, physical science is not one and invariable in its contents. There have been a multitude of scientific theories that cannot be reconciled with each other. The Ptolemaic and the Copernican astronomies are examples.²⁸⁶

Shedd acknowledges the variability of science. He notes that he changed mind on the proper interpretation of the cosmos and other natural processes many times. These are far more significant issues than any theological development discussions or in-house views of minor theological issues in different church traditions:

For centuries the Ptolemaic system was undisputed; and the skeptic of those centuries endeavored to show that the Bible did not agree with it, and the believer of those centuries endeavored with equal strenuousness to show that it did ... Christianity, on the other hand, has had substantial invariability. The differences between Christian believers, even upon the more recondite doctrines, are by no means so great as those between the ancient Greek and the modern Englishman upon the nature and laws of matter. The difference between the Augustinian and the Semipelagian or between the Calvinist and the Arminian is not at all equal to that between Ptolemy and Copernicus.²⁸⁷

There is a fundamental difference between the Scriptural core of Christianity and the supposed unshakable foundation of science. Postulating error is a rash move. Shedd argues that

²⁸⁶ William Shedd, *Dogmatic Theology*, ed. Alan W. Gomes, 3rd ed., 374–375.

²⁸⁷ *Ibid.*

what he calls the Biblical physics do not conflict with science. The Bible does not talk about many scientific details, most notably because it is not a scientific book (but it does contain some scientific information):

The doctrines of the Trinity, incarnation, apostasy, the redemption have always constituted the essential substance of the Christian faith. But no such substantial invariability as this appears in the history of physical science. Even, therefore, if it could not be shown that revelation is in harmony with a science that confessedly is not infallible and actually is not invariable, it would not be a very serious matter for revelation. The error might be upon the side of science. After this preliminary observation, we remark, in the first place, that the biblical physics does not conflict with the heliocentric Copernican theory. Nothing at all is said in the opening of Genesis respecting the motion of the earth in relation to the sun; and the phraseology in other parts of Scripture is popular and to be explained as it is when the modern astronomer himself speaks of the rising and setting of the sun. In the second place, the order of creation as given in Genesis is corroborated by the best settled results of modern physics. The whole field cannot of course be gone over. Let us test the matter by referring to geology, in respect to which science the conflict has been the most severe.²⁸⁸

(2) *Beauty*

God's creation shows the beauty of His creative abilities. Beauty is a compelling element that God uses to draw mankind to him. The highest form of beauty explores key Biblical themes like God's redemption. God's beauty is evident both in Divine revelation and the many areas of His created order that is available for mankind to uncover. Science often uses it to help discern when a compelling theory or law can be accepted as correct.

Oakes argues that beauty can be a useful part of apologetics. Hans Urs von Balthasar made beauty the starting point for his apologetics.²⁸⁹ People do not let themselves be argued into recognizing beauty. Either people see it, or they do not. So, Balthasar argues, and Oakes agrees, that apologetics focus on arguing, but on showing. For example, proofs for the existence of God

²⁸⁸ Ibid.

²⁸⁹ Daniel Treier. Mark Husbands, Roger Lundin, *The Beauty of God: Theology and the Arts* (Downer Grove, IL: InterVarsity Press, 2007), 209-211.

will not work well for those who do not perceive the beauty of revelation to begin with. No amount of explanation will convince a person if he or she cannot see how it is manifested in the world. No truth that emanates from the center of theology is not evident to them. One can create a theological presentation starting with the transcendental tenets of the beautiful, the good, and the true. Balthasar was convinced that the order of these three was important, and that one must start with beauty first. This is important if one wants to have some success in expressing theologically significant points to an increasingly skeptical public.²⁹⁰

Theology, with its study of God, is a creative process. Divine revelation can reveal that information in new ways as the Lord wants His children to gain more insight into His character. There is evidence about God and His working with man in various genres within Scripture. The more one learns about God, the more he or she experiences His beauty. God is the ultimate source and foundation of beauty. Only through Him can one get a true sense of reality.

The most apparent human experiences of nature show beauty and design. Some would argue these experiences come from chance, but this does not match the inference to the best explanation. Science looks deeper at these things. Looking closer, there is layer upon layer of intricate order and its accompanying beauty that can be known. Sanford, as an example of a scientist holding to Christian belief as a part of his extensive biological research, sees ample evidence for a connection between beauty, unity, and elegance. Beauty is the word science labels as the overwhelming accord found well-designed things.

(3) Logical Inferences

Knowing God's character, the fact that He makes creation discoverable, and the information already known about nature, mankind can make logical inferences for what else to

²⁹⁰ Ibid., 212.

look for. Thus, the creative uncovering of what is knowable in nature can be ongoing. Since God is a God of order, there is purpose what He creates. This is completely contrary to a Darwinian point of view. So, by taking this as a given, one can move forward in analyzing the creative order while using this as a presupposition. Therefore, an example of a logical inference would be: (1) God is a God of order, (2) there are observable systems that have well-defined functions, (3) therefore, there are one or more beneficial reasons why this system exists, and one can look for them based on his or her understanding of the character its Designer.

Application

This section has considered the aspects of the Divine decree and how this is described in Scripture and theological development. God put His creative capacity to work when he formed the world and left signatures for mankind to discover. Once one has a good understanding of these things, he or she can then consider how that understanding can be applied in interesting ways in order to better discern the scientific data that exists now and how to interpret what is being laid out. If God is a God of order, then one should be able to see logical progression and order in the various systems He has created. Biology is a rich area where this can be applied.

Several aspects of the cell are considered in order to tie the Divine decree to the known cellular design. It will show how the rich potential of God's creative design is manifested by the act of creation and continues to unfold in time according to His divine purpose. There is a cause and effect laid out that one can see and track.

(1) Theology to Science: God's Plan Reflected in the Cell's Design

Every living organism has a genome. This is a key element for cellular operations, providing coding instructions for creating proteins and many other levels of cellular function. Assuming a creationist point of view, God created the genomes for every living organism when

He created the earth. Thus, God's intent and orders via Divine decree is contained in every cell. When considering the complexity that exists in just one organism, this is clearly a very difficult accomplishment. Creating just one organism is beyond human understanding. Yet God performed this act numerous times, all during a short period of time. He put in the genetic potential in each species it would need to flourish and adapt within the context of its environment. Almost every cell in an organism has the complete genome. Therefore, within just one cell lies the DNA instructions for reproducing the whole organism.

(2) Science to Theology: Rich Biological Potential and the Mind of God

There is rich potential in the cell. Many complex systems operate in parallel. There are multiple layers of system operations in its finely-tuned workings. These various elements depend on one another and work together to form a whole. God spoke this into existence, and each organism has at least a degree of self-awareness and autonomy. God wanted people to be agents who could act on their own and possess His communicable attributes reflected in our lives in actions. The levels of design and complex functionality that exists in our bodies is overwhelming. One can reflect on the sub atomic, atomic, molecular, genomic, cellular, epigenetic, physiological, emotional, spiritual, mental, and other ways in which human systems functions with precision. We most definitely are fearfully and wonderfully made (Ps 139:14). In terms of the Divine decree, all this functionality was created within a day in the Genesis account. Man, operating at his best and given all the resources available in the world, could never do this. Yet God spoke it all into existence. There is continued research the functionality of our bodies to uncover more and more of what God designed. Human beings' complexity and beauty came from God, along with all creation, simply by Him speaking it into existence by the power of His word.

Conclusions from God's Divine Plan

This section summarized key biblical and theological sources that summarize what the Divine Decree is and how it applies to the created order in nature, and its implications. Finally, it examined how this could be applied in specific ways in biology.

God's plan as may be seen by the Divine Decree (or another theological construct) is a key element of God's nature. Before the foundation of the earth, He laid out His creation and knew the plan He would execute. His plan is evident in nature. One can look back and search for evidence back to the creation of the world. One can also find signatures in the new creation as he or she experiences in Christ. This perspective has the potential to impact how one looks at scientific data and possibly suggests new and innovative ways of gathering greater insight into discoverable truth from creation. By considering the Divine decree, one can look at scientific data in a new way. By assuming a priori that God designed the world and it unfolded according to His plan, one can better understand the workings of creation.

Biological Analytics and Bioinformatics

In order to keep the molecular biology analysis section focused strictly on the development of tin component of ADH on alcohol metabolism, more detailed information, analytics, and bioinformatic details are summarized here.

Explanation of P-Value

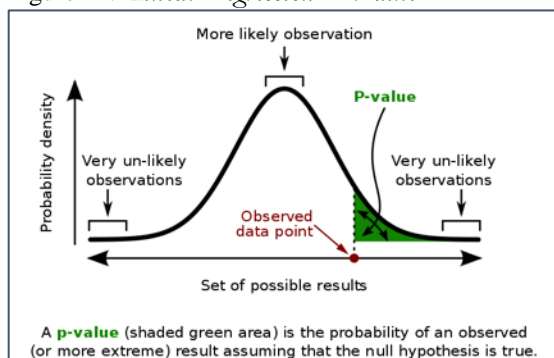
For molecular biology GWAS analysis, P-value is a metric that shows how distinctive a SNP is as compared to the others for a specific group of genetic samples. Mathematically, the P-value is a function of the observed sample results (a test statistic) relative to a statistical model, which measures how extreme the observation is. It is the probability that the observed result has nothing to do with what one is actually testing for. A small P-values means there is likely a

correlation relationship. This will be used in the GWAS data processing later in this section.

Chen-Pan Liao developed a clear illustration for the meaning of the P-value as shown Figure 22.

The P-value is shown by what is colored in green.²⁹¹

Figure 22. *Linear Regression P-Value*



The focused goal is to examine genome data and the role of alcohol dependency. Sample set is filtered for those self-identifying as having alcohol dependency. The available phenotype (“class”) is non-cancer disease data taken with patient describing details, with nurse or doctor, entering the proper clinical associations in the UK Biobank survey results.

Additional Data from UK Biobank GWAS Analysis

The following material presents the results of the more detailed processing and analysis of the UK Biobank data, and the Neale Lab preprocessed data that is accessible from their website resources. These tables and figures are referred to in the main body of the dissertation but contained enough additional information that did not directly focus on the function of ADH in alcohol metabolism, so it has been put together here for those who would like to examine this next layer of detail. The main focus has been placed on the P value via the Manhattan pots and Q-Q plots. The amount of data that is generated for each run is large. The table below shows the

²⁹¹ Chen-Pan Liao, “In Defense of the P-value,” <https://scientistseessquirrel.wordpress.com/2015/02/09/in-defence-of-the-p-value/>, accessed December 3, 2018.

data fields and the order of the preprocessed Neale Labs data. The main values that are used here for the Manhattan plots and QQ plots are: (1) CHR, chromosome number, BP base pair in the chromosome, (3) SNP identification number, (4) A1 allele 1, (5) A2 allele 2, the alternative allele, and (6) P the P-value for this SNP.

Table 12. Neale Lab Processed UK Biobank Data Fields

Name	Description
CHR	chromosome number
BP	base pair in the chromosome
A1	Allele 1
A2	Allele 2, alternative allele
SNP	SNP identification number (rsID) as provided by UK Biobank
AC	Dosage allele count from all samples with non-missing phenotypes
ytx	Dosage alternate allele count (ytx means "y*x" where y=phenotype and x=alternate allele dosage)
beta (OR)	linear regression beta coefficient
se	linear regression standard error
tstat	t-statistic of the regression
P	linear regression P-value

Table 13. UK Biobank Never Drank (Case 20117) Top 20 SNPs

#	CHR	BP	A1	A2	SNP	AC	ytx	beta	se	tstat	P
1	4	100239319	T	C	rs1229984	6.59E+05	2.02E+04	-1.30E-02	1.42E-03	-9.11E+00	7.98E-20
2	4	100248642	G	C	rs145452708	6.82E+03	3.01E+02	1.36E-02	2.12E-03	6.40E+00	1.59E-10
3	4	100262242	C	T	rs141973904	6.82E+03	3.01E+02	1.35E-02	2.12E-03	6.39E+00	1.69E-10
4	4	100249726	G	A	rs138495951	6.88E+03	3.02E+02	1.35E-02	2.12E-03	6.39E+00	1.71E-10
5	11	90842665	A	G	rs117605183	3.53E+03	1.61E+02	1.66E-02	3.06E-03	5.41E+00	6.46E-08
6	14	38255981	A	G	rs559791592	7.78E+02	4.90E+01	3.44E-02	6.40E-03	5.38E+00	7.57E-08
7	20	51340460	G	A	rs562074323	1.18E+03	6.58E+01	2.89E-02	5.49E-03	5.27E+00	1.38E-07
8	11	90470398	G	A	rs117845172	6.01E+03	2.53E+02	1.21E-02	2.31E-03	5.23E+00	1.69E-07
9	2	20419236	C	T	rs192265402	3.04E+03	1.41E+02	1.77E-02	3.40E-03	5.22E+00	1.78E-07
10	11	90465786	A	G	rs117894412	6.07E+03	2.54E+02	1.20E-02	2.31E-03	5.19E+00	2.11E-07
11	17	57360287	C	T	rs144662389	1.30E+03	7.15E+01	2.47E-02	4.87E-03	5.07E+00	3.94E-07
12	4	99713350	C	T	rs144198753	6.56E+03	2.70E+02	1.15E-02	2.27E-03	5.07E+00	4.05E-07
13	2	20409645	G	T	rs530542269	2.90E+03	1.34E+02	1.78E-02	3.52E-03	5.05E+00	4.38E-07
14	16	24244915	G	A	rs559954234	7.21E+02	4.36E+01	3.56E-02	7.09E-03	5.02E+00	5.07E-07
15	8	546957	C	A	rs4735807	1.60E+05	5.26E+03	2.48E-03	4.95E-04	5.02E+00	5.30E-07
16	17	57278291	C	A	rs533720092	1.05E+03	5.89E+01	2.81E-02	5.62E-03	5.00E+00	5.80E-07
17	5	105231317	T	C	rs139656225	2.47E+03	1.15E+02	1.92E-02	3.86E-03	4.97E+00	6.74E-07
18	8	116187143	G	T	rs13270016	3.21E+05	1.03E+04	2.09E-03	4.21E-04	4.97E+00	6.76E-07
19	11	90444982	C	T	rs77685802	6.35E+03	2.61E+02	1.13E-02	2.28E-03	4.95E+00	7.35E-07
20	14	38255743	G	T	rs564073469	8.70E+02	5.11E+01	2.99E-02	6.06E-03	4.94E+00	7.91E-07

Table 14. UK Biobank Former Alcoholic (Case 3731) Top 20 SNPs

#	CHR	BP	A1	A2	SNP	AC	ytx	beta	se	tstat	P
1	4	100239319	T	C	rs1229984	4.26E+04	2.25E+04	8.22E-02	1.46E-02	5.65E+00	1.61E-08
2	12	95830957	G	A	rs57355530	2.39E+03	1.13E+03	-5.61E-02	1.03E-02	-5.43E+00	5.72E-08
3	12	95833284	T	C	rs73229342	2.40E+03	1.13E+03	-5.60E-02	1.03E-02	-5.42E+00	6.09E-08
4	1	197728169	G	A	rs55995691	2.09E+04	1.13E+04	2.45E-02	4.70E-03	5.21E+00	1.94E-07
5	1	197768095	C	T	rs12564235	2.10E+04	1.13E+04	2.44E-02	4.70E-03	5.19E+00	2.14E-07
6	1	197740938	A	C	rs4915561	2.10E+04	1.13E+04	2.43E-02	4.70E-03	5.17E+00	2.40E-07
7	1	197735331	T	C	rs7516334	2.10E+04	1.13E+04	2.43E-02	4.70E-03	5.16E+00	2.43E-07
8	1	197772229	C	T	rs10922289	2.10E+04	1.13E+04	2.43E-02	4.70E-03	5.16E+00	2.45E-07
9	21	43228587	G	A	rs192569356	1.63E+02	5.51E+01	-2.04E-01	3.96E-02	-5.15E+00	2.57E-07
10	1	197747067	G	T	rs6675292	2.10E+04	1.13E+04	2.42E-02	4.70E-03	5.15E+00	2.59E-07
11	1	197771731	G	A	rs4268380	2.10E+04	1.13E+04	2.42E-02	4.70E-03	5.15E+00	2.61E-07
12	1	197746565	T	C	rs12081207	2.10E+04	1.13E+04	2.42E-02	4.70E-03	5.14E+00	2.72E-07
13	1	197734899	C	T	rs7516481	2.10E+04	1.13E+04	2.42E-02	4.70E-03	5.14E+00	2.73E-07
14	4	3720026	C	T	rs147993137	2.73E+02	1.82E+02	1.65E-01	3.23E-02	5.11E+00	3.26E-07
15	12	95834665	A	G	rs60167551	2.42E+03	1.15E+03	-5.23E-02	1.03E-02	-5.09E+00	3.63E-07
16	12	95835466	C	T	rs73229345	2.42E+03	1.15E+03	-5.22E-02	1.03E-02	-5.09E+00	3.70E-07
17	1	197806474	G	A	rs1010128	2.21E+04	1.19E+04	2.39E-02	4.71E-03	5.08E+00	3.80E-07
18	7	88732273	A	G	rs79416575	4.64E+02	3.00E+02	1.17E-01	2.31E-02	5.06E+00	4.14E-07
19	1	197794699	G	A	rs6667560	2.21E+04	1.19E+04	2.37E-02	4.70E-03	5.05E+00	4.52E-07
20	7	88712245	G	T	rs58129759	4.75E+02	3.07E+02	1.13E-01	2.26E-02	5.01E+00	5.47E-07

Figure 23. UK Biobank Data Fields 20117 and 3731 Samples and Statistics

UK Biobank Data Field 20117 is based on participant question A1 alcohol consumption: (1) never drank, (2) previously drank, or (3) currently drink

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Data-Field 20117
 Description: Alcohol drinker status
 Category: Alcohol - Lifestyle and environment - Touchscreen - UK Biobank Assessment Centre

Participants	501,653	Value Type	Categorical (single)	Sexed	Both sexes	Debut	Mar 2013
Item count	557,337	Item Type	Data	Instances	Defined (3)	Version	Mar 2019
Stability	Accruing	Strata	Derived	Array	No		

Data 3 Instances Notes 4 Categories 2 Related Data-Fields 0 Tabulations 1 Resource

557,337 items of data are available, covering 501,653 participants, encoded using Data-Coding 90. Defined-instances run from 0 to 2, labelled using Instancing 2.

Counts of participants/items last updated 24 Dec 2018.

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UK Biobank Data Field 3731 is based on participant question A1A, investigating whether a non-drinking individual formally drank

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Data-Field 3731
 Description: Former alcohol drinker
 Category: Alcohol - Lifestyle and environment - Touchscreen - UK Biobank Assessment Centre

Participants	41,901	Value Type	Categorical (single)	Sexed	Both sexes	Debut	Jan 2012
Item count	44,367	Item Type	Data	Instances	Defined (3)	Version	Mar 2019
Stability	Complete	Strata	Primary	Array	No		

Data 3 Instances Notes 4 Categories 3 Related Data-Fields 0 Tabulations 2 Resources

44,367 items of data are available, covering 41,901 participants, encoded using Data-Coding 100352. Defined-instances run from 0 to 2, labelled using Instancing 2.

Counts of participants/items last updated 04 Feb 2017.

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Table 15. UK Biobank Alcohol Related Participant Touchscreen Questions (1 of 2)

Name, Variable	Question Stem	Responses	Validations	Actions	Hints
A1, 20117	About how often do you drink alcohol?	SELECT one of 7 from 1: Daily or almost daily 2: Three or four times a week 3: Once or twice a week 4: One to three times a month 5: Special occasions only 6: Never -3: Prefer not to answer		Default A3B except: 4 : A2B 5 : A2B 6 : A1A -3 : INTRO5	If this varies a lot, please provide an average considering your intake over the last year
A1A, 3731	Did you previously drink alcohol?	SELECT one of 3 from 1: Yes 2: No -3: Prefer not to answer		Default A7A except: 0 : INTRO5 -3 : INTRO5	
A2B, 4407	In an average MONTH, how many glasses of RED wine would you drink? (There are six glasses in an average bottle)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 10 Units: glasses	Go to A2C	Please include sparkling red wine here.
A2C, 4418	In an average MONTH, how many glasses of WHITE wine or champagne would you drink? (There are six glasses in an average bottle)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 10 Units: glasses	Go to A2E	Please include sparkling white wine here.
A2E, 4429	In an average MONTH, how many pints of beer or cider would you drink? (Include bitter, lager, stout, ale, Guinness)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 10 Units: pints	Go to A2A	
A2A, 4440	In an average MONTH, how many measures of spirits or liqueurs would you drink? (there are 25 standard measures in a normal sized bottle; spirits include drinks such as whisky, gin, rum, vodka, brandy)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 10 Units: measures	Go to A2F	
A2F, 4451	In an average MONTH, how many glasses of fortified wine would you drink? (There are 12 glasses in an average bottle) (Fortified wines include drinks such as sherry, port, vermouth)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 10 Units: glasses	Go to A2G	Fortified wines include: Sherry, Port, Vermouth, Muscat, Madeira, Malaga, Tokay, Frontignan, Frontignac.
A2G, 4462	In an average MONTH, how many glasses of other alcoholic drinks (such as alcopops) would you drink?	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: ≥ 0 Expect: undefined Units: glasses	Go to A5	
A3B, 1568	In an average WEEK, how many glasses of RED wine would you drink? (There are six glasses in an average bottle)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 100 Units: glasses	Go to A3C	Please include sparkling red wine here.
A3B, 1578	In an average WEEK, how many glasses of WHITE wine or champagne would you drink? (There are six glasses in an average bottle)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 100 Units: glasses	Go to A3E	Please include sparkling white wine here.

Table 16. UK Biobank Alcohol Related Participant Touchscreen Questions (2 of 2)

Name, Variable	Question Stem	Responses	Validations	Actions	Hints
A3E, 1588	In an average WEEK, how many pints of beer or cider would you drink? (Include bitter, lager, stout, ale, Guinness)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 100 Units: pints	Go to A3A	
A3A, 1598	In an average WEEK, how many measures of spirits or liqueurs would you drink? (there are 25 standard measures in a normal sized bottle; spirits include drinks such as whisky, gin, rum, vodka, brandy)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 100 Units: measures	Go to A3F	For mixed drinks that contain spirits or liqueurs, count one bottle as one measure. There is a question later on alcopops
A3F, 1608	In an average WEEK, how many glasses of fortified wine would you drink? (There are 12 glasses in an average bottle; Fortified wines include drinks such as sherry, port, vermouth)	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: $\geq 0, \leq 250$ Expect: ≤ 100 Units: glasses	Go to A3G	Fortified wines include: Sherry, Port, Vermouth, Muscat, Madeira, Malaga, Tokay, Frontignan, Frontignac.
A3G, 5364	In an average WEEK, how many glasses of other alcoholic drinks (such as alcopops) would you drink?	Enter INTEGER OR -1: Do not know OR -3: Prefer not to answer	Require: ≥ 0 Expect: undefined Units: glasses	Go to A5	
A5, 1618	When you drink alcohol is it usually with meals?	SELECT one of 5 from 1: Yes 2: No -6: It varies -1: Do not know -3: Prefer not to answer		Go to A6	
A6, 1628	Compared to 10 years ago, do you drink?	SELECT one of 5 from 1: More nowadays 2: About the same 3: Less nowadays -1: Do not know -3: Prefer not to answer		Default INTRO5 except: 3 A7	
A7, 2664	Why did you reduce the amount you drank?	SELECT one of 7 from 1: Illness or ill health 2: Doctor's advice 3: Health precaution 4: Financial reasons 5: Other reason -1: Do not know -3: Prefer not to answer		Go to INTRO5	
A7A, 3859	Why did you stop drinking alcohol?	SELECT one of 7 from 1: Illness or ill health 2: Doctor's advice 3: Health precaution 4: Financial reasons 5: Other reason -1: Do not know -3: Prefer not to answer		Go to INTRO5	
INTRO5	Now, some questions about you and your family.	INFO		Go to D2	

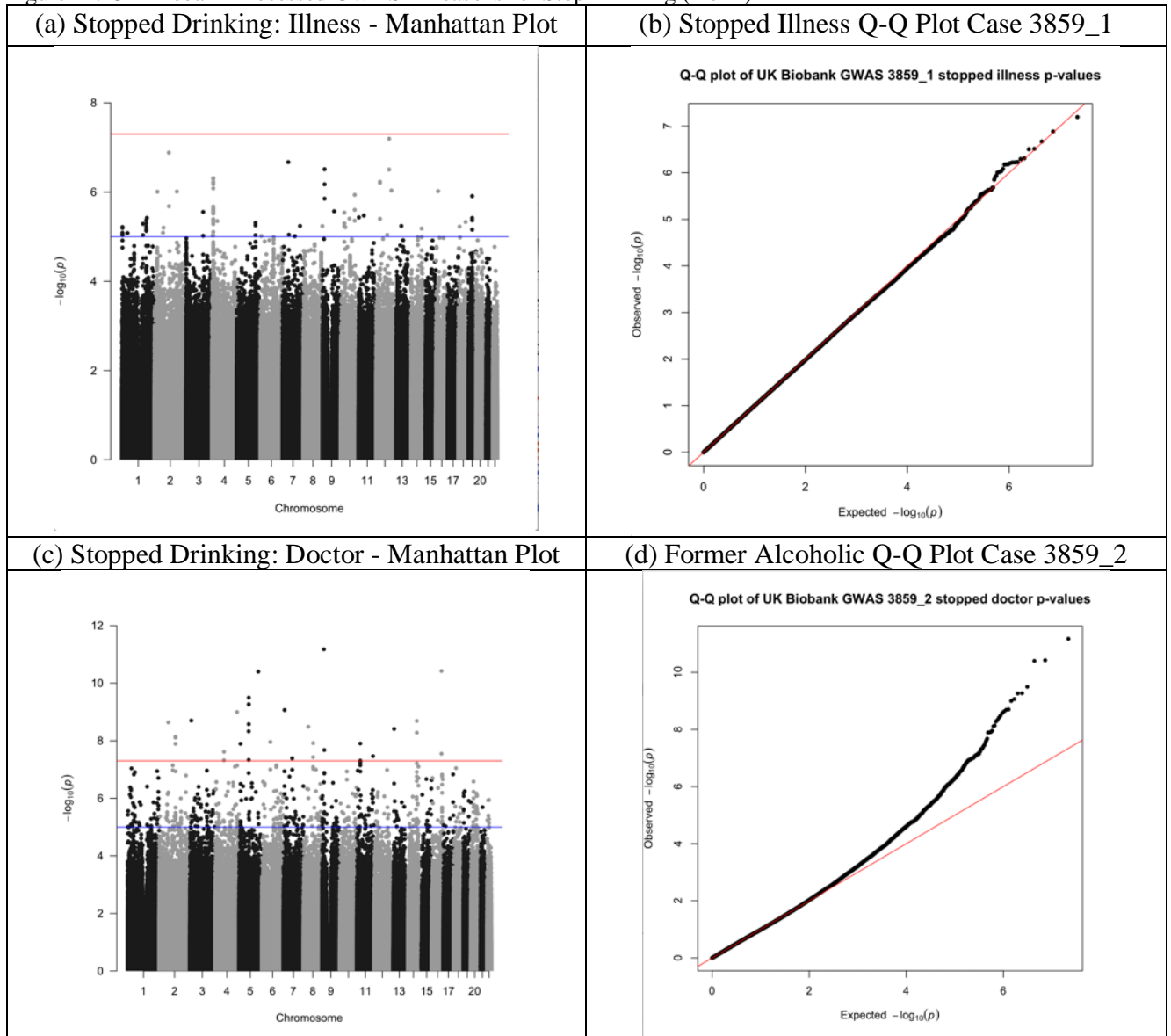
Other UK Biobank GWAS Processed Data Assessments

In the data research phase, a number of UK Biobank cases were examined. The Manhattan plots and QQ Plots for these cases are shown here for completeness, although they do

not directly contribute to illuminating aspects of the ADH component for alcohol metabolism. These include the following: (1) four cases why individuals stopped drinking (illness, doctor, health, and finances), (2) individuals who report they are happiness, (3) individuals who state they have plenty of friends, and (4) alcohol dependency-caused disease, especially liver cirrhosis. Figure 24 and Figure 25 show results for the four cases where individuals chose to stop drinking. Figure 26 shows the results for happy and friends. Figure 26 shows the results for those experiencing alcohol dependency disease. Figure 28 shows more of the UK Biobank data for this case highlighting alcohol-related diseases, and many other non-cancer diseases that were evaluated.²⁹²

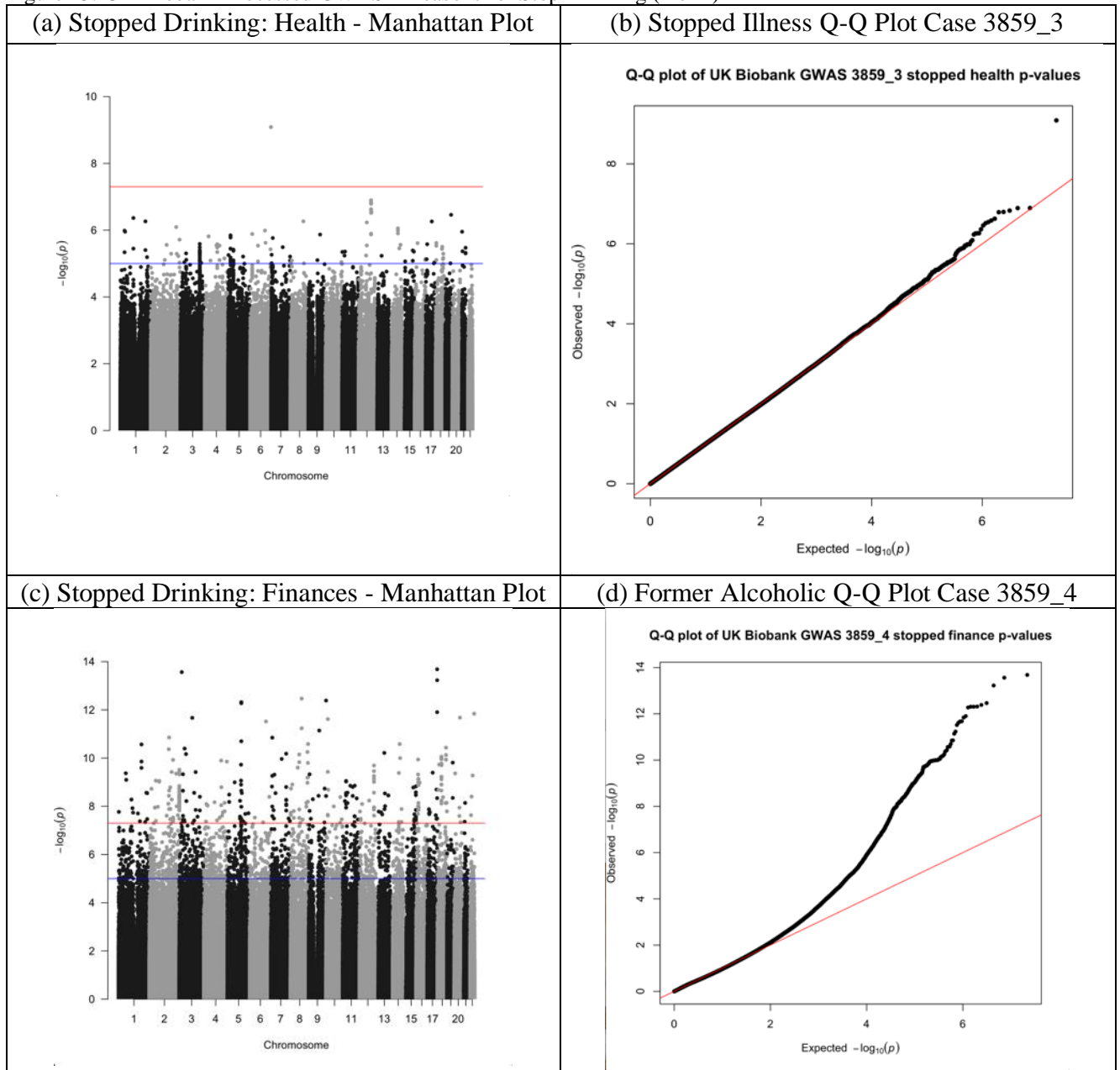
²⁹² UK Biobank Data, Data-Field 20000, <http://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=20002>, accessed April 21, 2019.

Figure 24. UK Biobank Processed GWAS – Reasons for Stop Drinking (1 of 2)



This figure shows the first two cases of why individuals stopped drinking. There is not a strong $- \log_{10}(p)$ value for illness, but for doctor's advice, there is the highest P Value in chromosome 9.

Figure 25. UK Biobank Processed GWAS – Reasons for Stop Drinking (2 of 2)



For the case of health, there is a distinctive P Value found in chromosome 7. For the case of finances there are no clear drivers although chromosome 17 and 3 produce distinctive P Values.

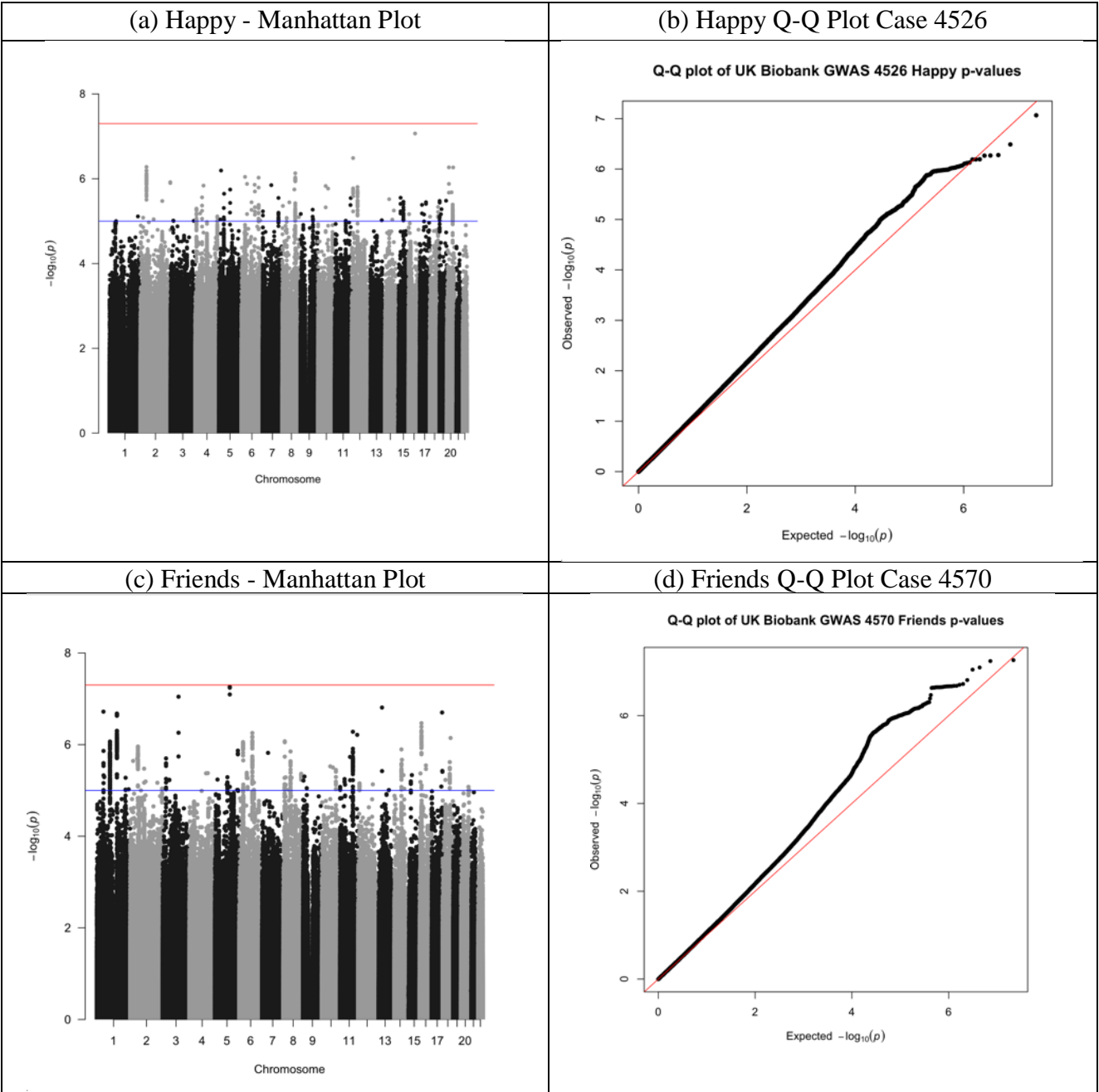
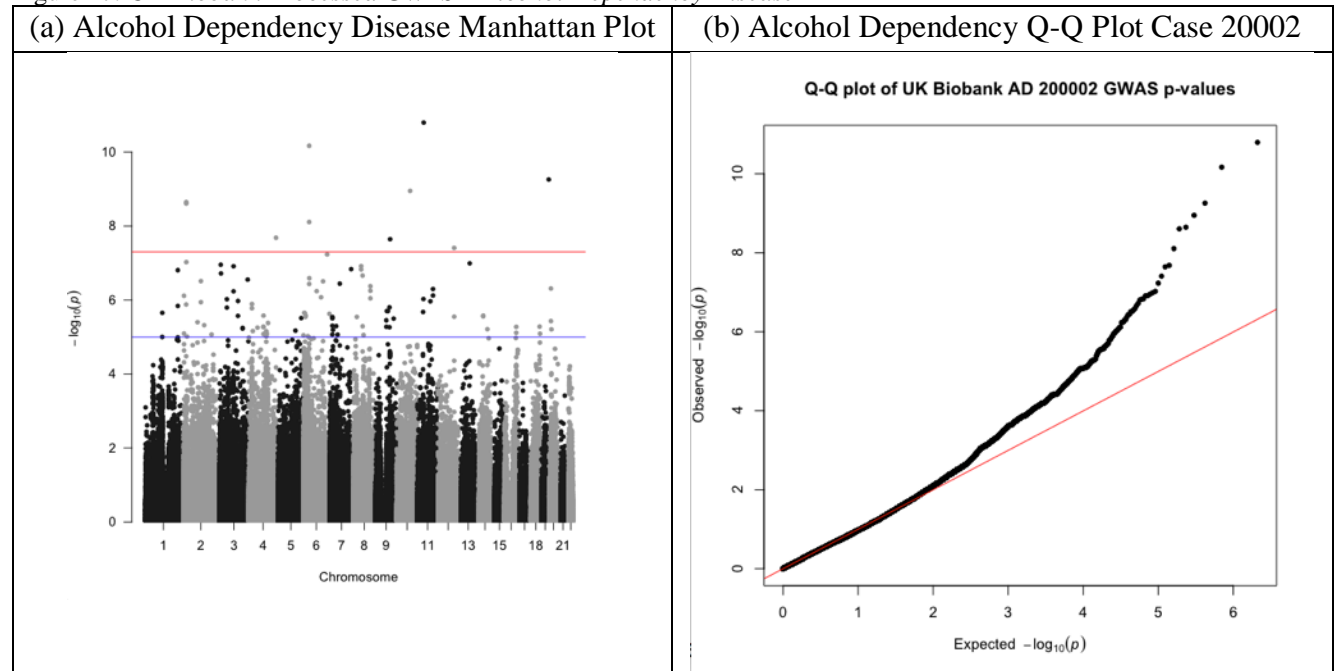


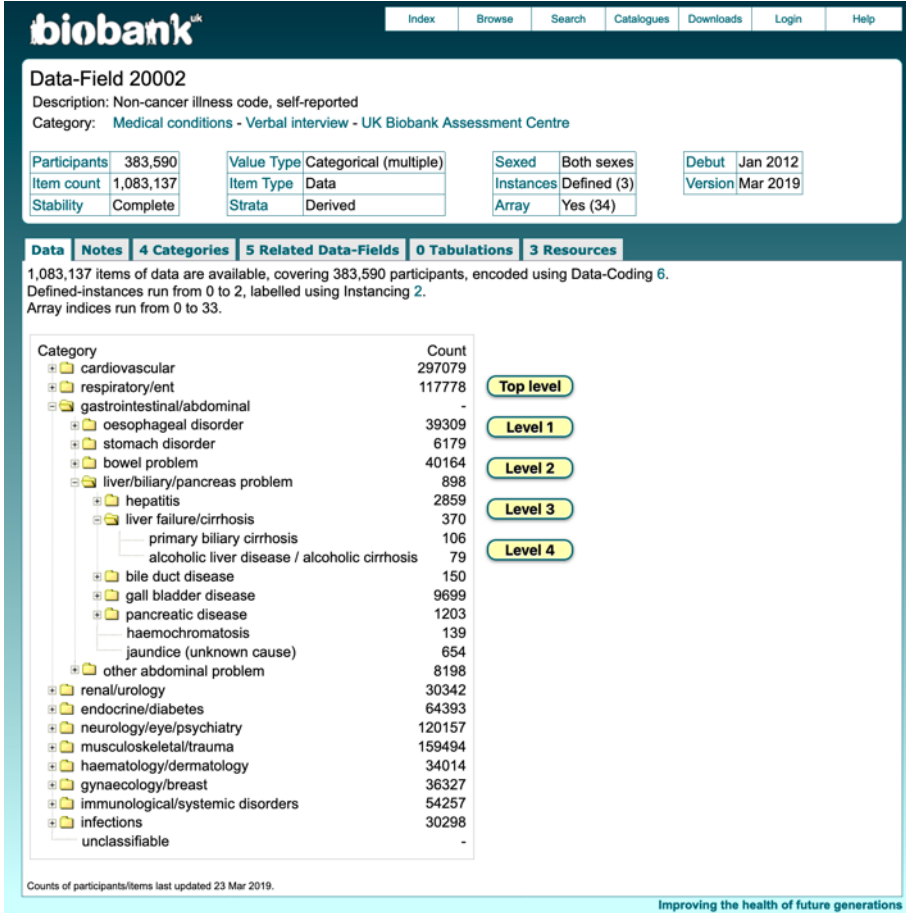
Figure 26. UK Biobank Processed GWAS – Happy and Friends Cases
 For the cases of happy and friends there is not a distinctive SNP that shows up as being statistically significant.

Figure 27. UK Biobank Processed GWAS – Alcohol Dependency Disease



For alcohol dependency disease the highest P Value SNP is in chromosome 11. This shows a degree of a statistically significant SNP.

Figure 28. UK Biobank Processed Case 20002 Data Field



This figure shows the range of diseases that are quantified for UK Biobank participants. The number with liver cirrhosis is shown here to be 79.

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