RELIGIOUS FAITH WITHIN THE SCIENTIFIC REVOLUTION: A STRUGGLE THROUGHOUT BACONIAN LITERATURE

by

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ABSTRACT

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This project considers the dual nature of early English thinker Francis Bacon as both a man of science and a devout Christian, through the texts *Advancement of Learning*, *A Confession of Faith*, and *Of Gardens*. Regardless of Bacon's preaching that the progression of scientific knowledge brings one closer to God, in fact human dominance over the natural world undermines religious faith. In particular, Bacon's own interest in early English gardening is used to illustrate the degradation of religious mysticism due to the rise of scientific discovery. Historically, Bacon has been credited as the catalyst of the scientific revolution due to his proposition of a new system of scientific inquiry based on empirical and inductive principles and the development of new arts and inventions. However, Bacon's embrace of the physical sciences and support for human advancement contradicts his alignment with religion. This tension is at the heart of the paper.

Dedication

This is dedicated to my Mom & Dad:
For all your love, support, and encouragement throughout my life; a very special thank you.

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Introduction

English philosopher Francis Bacon has been credited as the catalyst of the scientific revolution due to his proposition of an entirely new system of scientific inquiry based on empirical and inductive principles and the development of new arts and inventions. Critic Paula Findlen suggests that "Bacon belongs to the canon of individuals whose innovations comprise our image of the scientific revolution…In this capacity, Bacon has been hailed variously as the father of induction, the first serious proponent of experimentation, and the blueprint for modern man" (239). Natural philosophy in the early modern period is roughly what we today would call science. It is the study of nature in all its various dimensions, including the study of the structure and function of all natural objects. Bacon believed that he had provided a new method for natural philosophy due to the addition of the Inductive method as suggested above by Findlen. Induction is reasoning that moves from the specific to the general with arguments based on experience or observation (versus the deductive method, which begins with the general and ends with the specific). Bacon calls for a progression in the fields of science and philosophy that will allow human kind to obtain a mastery over the natural world. Yet at the same time, for Bacon, education is fundamentally a religious endeavor. This notion of education being religious is at odds with his appeal for natural philosophy within his reformation of knowledge because there is a fundamental disconnect between religion and knowledge. Many of Bacon's writings analyze and critique 17th- Century science and philosophy and suggest ways in which early modern European men and women can relieve the hardships of daily life. From this strong, seemingly inherent desire for 'man' to conquer nature, Bacon, perhaps inadvertently, begins to restrict and diminish the role

of the divine, God, in daily life. Essentially, there is a basic bi-polar clash between faith and science that drives the culture. This project will consider the tension between Francis Bacon, the man of science, and Francis Bacon, the Christian, through his texts *The Advancement of Learning*, *A Confession of Faith*, and *Of Gardens*. It is my argument that regardless of Bacon's preaching that scientific knowledge and philosophy bring one closer to God and religion, in fact this human dominance over the natural world undermines that faith. Chapter One will focus on Bacon's *Advancement of Learning* and his plans for the reformation of knowledge. Chapter Two will focus on Bacon's *Confession*, in order to demonstrate that the religious voice of the 'confession' is overshadowed and undermined by his explanation of religion in scientific terms. Then, Chapter Three will move to Bacon's essay *Of Gardens* where he begins by expressing the vital connection between God and gardens, but then shifts tone by focusing more on the scientific aspects of gardening.

By the end of the 16th Century, the conflict between belief and unbelief enunciate the confusion Christian Europe experienced. The Catholic Church was beginning to regain some of its former glory after being denounced by Martin Luther for low moral standards, among other accusations at the start of the 16th Century. Within the Protestant denomination, further divides occurred separating into Lutheranism, Calvinism, and other smaller subsets. The continual divides amongst the Protestants into Anabaptists, Zwinglians, and other lesser, obscure religious groups emphasizes the continual break down of large, institutionalized religious faith. This proliferation of faiths into independent and distinctive sects allows for the skewing and manipulating of religious faith. Needless to say, atheism and blasphemy were not far out of reach for Europeans

fighting to hold on to some form divine belief. Francis Bacon subscribed to being a devout servant of the Protestant religion, but above all a fervent follower of the King, James I of England. The many political positions Bacon held and his own desire to rise within the social echelon of Early England diminish his claim as a devout servant of God. It is Bacon's personal divide between 'Church' and State that influences and is expressed throughout his writings. This divide as a religious man and man of society set the stage for a tension that ultimately questions Bacon's true allegiance.

The uncertain, early years of the Scientific Revolution introduced many new thoughts, inventions, and minds that changed the understanding of the natural world and human expectations of it. By the mid 16th Century, astronomer Nicolaus Copernicus published the first of two controversial works, where he asserts that the sun, not the earth, is at the center of the solar system. Copernicus' works along with the advancements made by other early scientists of the 17th Century such as Johannes Kepler, Galileo, and Isaac Newton stimulated dramatic advancements in scientific understanding, which ultimately evolved into the scientific revolution. Remarkable work in mathematics, physics, and astronomy were exponentially growing at this time, creating an evolution of scientific thought across Europe. Francis Bacon, also, is one of the minds credited as a father of the Scientific Revolution of the 17th Century. These numerous developments in virtually all areas of higher learning allow for a desensitizing of faith in daily life. Public discourse was changing with all the news and publicity of the evolving intellect and knowledge happening during this time, along with the divides previously mentioned, placing the validity of religious belief at stake.

Francis Bacon, philosopher and scientific inquirer, wrote various essays for the reconstruction of philosophy, new visions of science, and placing both philosophy and science within early modern society exactly for the purpose of providing men and women the hope for a better future. However, Bacon takes an unexpected and seemingly contradictory approach to the way in which he chooses to write these presumably scientific writings. He utilizes many religious motifs and tropes that establish religion as a kind of central theme of scientific and philosophical thought. From this desire to explain learning and education in religious terms, a contradiction arises in expounding upon 'phenomena' of the world through scientific experimentation, while also attempting to call them mysteries that are controlled by a divinity. It is not viable to claim that an event occurs due to feasible, practical scientific analysis and also from the grace of God. These two positions are mutually exclusive events. Critic Brian Vickers claims that Bacon's lifelong goal is the "improve[ment of] the amount and quality of knowledge available to mankind, so as to alleviate the miseries of human existence" (xx). Bacon advocates assigning science a place in society that will produce a supremacy over the natural world for man. A prominent author on Francis Bacon and his life, James Spedding, describes Bacon's religious beliefs as –

> embracing Christianity's moral and social emphases, accepting the authority and benevolence of God, and recognizing the life of Christ as the highest proof of divine care for man. But over and above these beliefs, the entire scheme of Christian theology,- creation, temptation, fall, meditation, election, reprobation, redemption,- is clearly in his thoughts, but underlies everything. (Spedding 21)

It is impracticable for Bacon to suggest that both the laws of nature, where physical regularities of daily life can be established by observation and experiment, and religion, where an explanation of the natural world is rooted in the trustworthiness and belief in a

supreme being, can develop and balance together. If an event can be both explained and duplicated, as seen by Bacon's ideas on the development of learning and the scientific method, it becomes difficult then to attribute these same events to the mysteries and divinity of God. The conflict between faith and science is at the foundations of both doctrines. Neither mode of belief is able to support or uphold the other, thus they must weaken and deny one another. Scientific improvement in human life runs counter to the very notion of Christian faith because knowledge gained brings man continuously closer to becoming an all-knowing being, which threatens the presence of an omniscient God. In a way, the fallen and disenfranchised condition of humankind after the Fall of Adam and Eve is taken to new heights through the exceptional innovations and learning happening in the 17th Century.

With these two issues, the first being Bacon's personal divide as man of faith and man of science, and second, the inherent contradiction of faith and science in general, both promote and ultimately allow for an inconsistency in Bacon's own writings in particular. In one of his earliest writings, *The Advancement of Learning*, written in 1605, Bacon writes that he hopes to –

> purge knowledge of two sorts of rovers [misleading trends], whereof the one with frivolous disputations, confutations, and verbosities, the other with blind experiments and auricular traditions and impostures [and also promote] industrious observations, grounded conclusions, and profitable inventions and discoveries. (Bacon 577)

Advancement is divided into two books, whereby the first "defends knowledge in general from all its enemies, ecclesiastical and secular, then [in the second] to argue for its dignity and value" (Vickers 577). From this quote, it can be seen that Bacon is strict in demanding for experimentation to be more sound and accurate. Observation and analysis

of the results to obtain 'grounded conclusions,' as Bacon suggests, is the only way in which inventions and theories can be made and aid humankind. The tools of knowledge are being refurbished and, to an extent, revamped in order to produce revolutionary new concepts and ideas. From Bacon's own push for this new way of viewing the world, it might be safe to suggest that he, as well as the other scientific minds of the period, are essentially prying into the secrets of God. Curiosity and the need to 'know' are traditionally thought to be negative ambitions within religious camps. For Bacon, throughout the two books of *Advancement* he attempts to keep Scripture and science separate, as they well are, but is at pains to emphasize that the pursuit of learning in no way damages Christian belief or observances. However, Bacon's thesis, about the dignity of learning being shown by divine testimony from the Bible, fails to consider that the human race is forever tainted with original sin because Adam and Eve ate from the Tree of Knowledge of Good and Evil. The pursuit of learning for man cannot thrive within a religious realm due to the fact that, biblically, man was not actually supposed to be conscious of the workings of the world, as God is.

Bacon's *Confession of Faith,* first published in 1641 discusses God, the Creation, and Christ, but also includes an undercurrent concern with natural philosophy, which ultimately overshadows his 'confession.' It seems that Bacon demonstrates the competitive nature between religion and science unknowingly precisely by trying to mix the two. Many of the points made throughout the *Confession* follow Calvinist theology on such topics as "the elect and the reprobate, the manner of Christ's meditation, the corruption of man and nature by the Fall, and predestination," but begins to shift off topic when discussing the Fall, man, and nature (Vickers 562). Bacon emphasizes the

importance and centrality of the laws of nature and laws of creation, but does so in order to apply and define them in ways that are scientifically understood. It seems as if he is trying to blur the lines between religion and science in order to marry them in some way, but in fact accomplishes the exact opposite. Ultimately, the religious voice of the 'confession' is overshadowed and undermined by the scientific language describing the regular recurrence of natural and physical phenomena. What Bacon has really done here is create a confession of his faith in science, not religion. Yet again, as in the *Advancement*, Bacon's conflicting principles permeate his writing.

Bacon's 1625 essay *On Gardens* reveals not only desirable parameters for an early English garden according to Bacon, but divulges a great deal of information about both botanical sciences and the culture of Stuart England. Bacon's essay begins most notably with the words: "God Almighty first planted a Garden. And indeed it is the purest of human pleasures" (430). Bacon's essay thereafter is a compilation of knowledge on plants, mathematics, and architecture. Bacon begins the essay by expressing the vital connection between God and gardens, but then shifts tone by focusing more on the sciences. From the implementation of taxonomy, arithmetic, and landscape architecture, human kind can conquer and order nature. Man is in full control and understanding of the laws of nature, and is thus able to command them.

Francis Bacon, one of the leading figures in natural philosophy and in the field of scientific methodology in the period of transition from the Renaissance to the Modern Era in England, is at odds with himself concerning faith and science, which is exhibited most prominently in his writings. To reiterate, this thesis analyzes and interprets the discord among faith and science found in three of Bacon's writings: *The Advancement of*

Learning, *A Confession of Faith*, and *Of Gardens*. It is my hope that the points made will indicate not only the various points of contention in the texts themselves, but also that Bacon struggles to conjoin the two theories. My eventual assertion, however, is that as much as Bacon longs to connect faith and science, he ultimately ends up showcasing their contradictions and falls in line more as a man of science than of faith.

Chapter 1

Throughout *The Advancement of Learning*, Francis Bacon sets out to redraw the map of knowledge, whereby progression in the fields of science and philosophy will allow human kind to obtain mastery over the natural world. According to scholar Christopher Hill, this strong, inherent desire for man to conquer nature stems from the fact that "[m]en seek knowledge 'for the benefit and use in life'" (85). Many of Bacon's writings look to enhance the position of man over nature in order to lessen the adversities and struggles of life, and his *Advancement* is no exception. It is my aim to analyze *The Advancement of Learning* for both its religious and intellectual implications in order to demonstrate that, ultimately, Bacon's reconstruction of knowledge challenges religious belief and, furthermore, that his religious aspirations are false and used more to augment his own social status.

The structure of *The Advancement of Learning* describes various processes of increasing knowledge, where explanations of natural philosophy and the inductive principle are the prime methodologies. To restate, natural philosophy in the early modern period is roughly another term for science. It is the study of nature in all its dimensions, including the structure and function of natural objects. Bacon believed he had provided a new method for natural philosophy due to the addition of the inductive method. Desiree Hellegers in her book *Handmaid to Divinity* suggests that "Bacon's inductive philosophy will supply a precise and systematic experimental methodology, that, with the 'help of instruments,' or prosthetic technologies, will correct the failures and weaknesses of the fallen human senses," thus allowing humankind to better provide for themselves, which is the ending goal of science for Bacon (39). It is vital to understand that these "fallen

senses," in which Hellegers points out, are a product of the biblical Fall of Adam and Eve. Humans are sensual, corrupt, and mortal due to the Fall, thus weaker against the world in which the first man and woman was initially in harmony. At the onset, Bacon has seemingly been able to sustain faith and science by suggesting that science is the conduit to bring man back to Adam's pre-fallen state. To further identify this first step taken when discussing faith and science in the *Advancement*, Bacon states that –

> knowledge is of those things which are to be accepted of with great limitation and caution; that the aspiring to over-much knowledge was the original temptation and sin, whereupon ensued the fall of man; that knowledge hath in it somewhat of the serpent, and therefore where it entereth into a man it makes him swell. (122)

From this view of knowledge as something to be feared, which is precisely in line with the Bible, it is no surprise then that Bacon's goal of natural philosophy "is to provide a definitive reading of the Book of Nature, and this definitive reading is itself synonymous with the project of reconstructing the lost language of Adam" (Hellegers 38). In essence, he is looking to restore man's position religiously through science. However, it is impossible to revert back to the 'lost language of Adam' because there is no road back from knowledge. In other words, once something is known there is no way to unlearn it. Furthermore, it is somewhat surprising that Bacon literally states that when striving to obtain knowledge one should be cautious and that the lure of wanting to know more is what caused the Fall. Yet he continually calls for finding a better, more precise way of learning and knowing about the natural world.

Bacon's assertion of introducing natural philosophy and the inductive method into society in order to promote technology is simply another, more modern, form of the serpent (temptation reincarnate). The bible states that "when the woman saw that the fruit

of the tree was…desirable for gaining wisdom, she took some and ate it [and] also gave some to her husband…then the eyes of both of them were opened" (Genesis 3:6-8). The most vital point is that Eve understood that the apple would afford her, as well as her husband, wisdom and the temptation of this knowledge overcame her. She wanted to be aware of and command the natural world. To parallel this to early England and the scientific thought of Bacon, it is precisely through the inductive method (serpent) that technology (the fruit) will allow for the modern man and woman (Adam and Eve) to learn more about the natural world. Thus, the evolving scientific method and the reformation of knowledge Bacon is setting in the *Advancement* will only further set man on a track away from God. While Bacon clearly does not see or believe this assertion, since for him "the obtaining of information resteth upon the true and sound interpretation of the Scriptures," he fails to recognize that there is a contradictory nature between the two disciplines, and that the implications built by his own scheming lifestyle undermine his attempt of paralleling science and religion (293).

Bacon suggests that the excellence of learning and knowledge is, in part, shown by divine testimony, which endows learning with a quality of dignity. What he seems to be attempting to accomplish is aligning scientific inquiry and intellectual progression with the study of Scripture. In Book One of *The Advancement of Learning*, Bacon states–

> let us seek the dignity of knowledge in the arch-type or first platform, which is in the attributes and acts of God, as far as they are revealed to man and may be observed with sobriety; wherein we may not seek it by the name of learning; for all learning is knowledge acquired, and all knowledge in God is original: and therefore we must look for it by another name, that of wisdom or sapience, as the Scriptures call it. (148-149)

The intention here is to demonstrate that education is, at heart, a religious endeavor. All scholarship and progression is then a product of divine worship and is consistent with God's plan for the fallen man. For ten pages, Bacon cites various divine testimonies of Moses, Job, Solomon, Christ, the Apostles, the Jesuits, and so on and how their learning and advancements are all in line with religious adoration. Logically then, all acquisition of knowledge is a kind of road to God. Christopher Hill states in the book *The Intellectual Origins of the English Revolution* that Bacon assumes "the apprehension of [natural] truth helps to repair…the Fall, and that the first steps to enable a man to the achieving of great designs is to be persuaded that by endeavor he is able to achieve it" (81-82). The suggestion then is that all men, through pursuits of knowledge, have the ability to save themselves from the taint of original sin. However, this isn't exactly correct. The taint is irremovable and remains on all men and women. Scholarship becomes in a way a religious order that invents rather than prays and offers new technologies to society as charity. What is most surprising about this road to redemption is that it is on one's own accord. There is no priest and no Church that directs one along this path. All a person needs is a passion for learning. As Desiree Hellegers states, "Bacon insists upon man's capacity to restore both the order of nature and the knowledge and language of Adam through his own agency" (61). Learning finally becomes a solitary means of communicating with God.

However, beneath Bacon's suggestion that learning and knowledge are ways to bring one closer to God, in fact this knowledge of the powers of nature are explicitly associated with his own material gain. Historically, Bacon was heavily involved in matters of state and society in the 17th Century. On the whole, his life story was a

relentless push for position. King James I succession to the throne in 1603 brought Bacon appointments such as solicitor general in 1607, attorney general in 1613, and finally Lord High Chancellor in 1618. Though soon after his selection as Lord High Chancellor, Bacon was charged with twenty-eight counts of bribery and pronounced guilty by the High Court of Parliament (Boorstin 133). As Daniel J. Boorstin concludes in his book, *The Seekers*, "Bacon was a man of affairs, active in politics, member of Parliament, counselor of sovereigns" (132). These backgrounds as lawyer, scientist, and heavily devoted servant of the King all question where God fits into Bacon's priorities. It is perfectly acceptable to suggest that devout and pious people seek position in society from which to wield power for the good, i.e God, but it's Bacon's bribery charge that seems to counteract this claim. Bacon took bribes such as money, furs, gold, and other expensive items for favor toward particular parties in the court cases he judged. John T. Noonan, Jr. in his book *Bribes* states that-

> Bribe income makes up part of the total sum which is so much larger than his [Bacon's] legitimate twelve-month income, and on an annual basis amount to 16,640 pounds – a not improbably estimate of the chancellor's takings from all sources. Whatever the correct estimate, the amount was substantial and higher than the incomes of most persons in the kingdom. (Noonan 360)

Discounting the King, Bacon was one of the richest men in England at the time, which begs the question, what did he do with all this money and goods? Well, Bacon owned numerous estates throughout England which were grandly furbished; he continued climbing the social ladder and substantiated his position with the bribe money, and, frankly, led a rather luxurious lifestyle. Although he was momentarily incarcerated in the Tower of London, stripped of office, banished from London and from public life, and

died a broken man, in the long run he kept the material items of what he had taken during his years in politics.

Furthermore, while in favorable social position, Bacon used his knowledge about religious beliefs to cement himself with and influence James I of England. Throughout most of Bacon's indictment, the King was continuously on his side, until multiple pieces of evidence and expanding number of accusations became too substantial. Nonetheless, Bacon and James I's relationship was very close, perhaps too close. Desiree Hellegers states that Bacon described himself as –

> uniquely qualified to provide the kind of counsel that, in his account, both licenses and enables Christ's, and implicitly James's, powers to subdue nature, theological error, and in Bacon's encompassing use of the word 'ignorance,' an evidently broad range of misconceived beliefs. (43)

What can be found here is that Bacon looked to align the learned man (himself) with God, in order that his advising to the King would then be indispensable, as if they came from God himself. Bacon's own ambitions create further divides in the relationship between science and faith, in addition to the natural antagonism that exists between the two. Hellegers also notes that Bacon "valorizes the exploitative goals of his natural philosophy, assuring James of the piousness of his project by suggesting that its highest attainment will be insight into divine truth, and by representing the philosopher- king as God's innocuous playfellow in nature" (42). Bacon uses his writing skills and adeptness for persuasion to hide his motive of giving science a central place in society. He wants his push for the valorization of natural philosophy to be taken seriously, and what better way to do this than paralleling it with religious zeal. Bacon continued to work desperately to win royal favor for his scientific schemes and ultimately used religion as a means to do so.

From Bacon's survey of learning, the inclusion of natural philosophy is the primary goal in his reformation of knowledge. The complexity of natural philosophy is divided into two parts, "the Inquisition of Causes, and the Production of Effects; Speculative, and Operative; Natural Science, and Natural Prudence" (Bacon 193). Through the suggestion to include this academic area in his reformation, Bacon looks for a separation of theory and practice. The most vital aspect of natural philosophy is its rule that all observation and experimentation have the ability to be duplicated with the same outcome continuously, i.e. the inductive principle. In many ways, this is the first outline of the modern day scientific method. This new method of the 17th Century was, in essence, a guarantee of truth. Nicholas Rescher states in his book *The Limits of Science,* that "the only legitimate theories are those that can be inductively inferred by simple generalization from observable data" (39). Bacon is striving to reformulate natural philosophy into a more rigorous scientific study in order to deem the area a classical pursuit, thus fortifying it within academia and society. Donald R. Kelley states that "[f]or Bacon,…'disciplining' natural history meant extricating it from its 'trivial' humanist condition and setting it on a methodical and scientific course" (7). The creation of this approach to nature would make its study and those who practice it more deserving of public recognition because it would foster technologies that could endlessly aid the common man. For Bacon personally, this advancement would give him fame.

From the inductive principle, which again is reasoning that moves from the specific to the general, knowledge is born from experience and observation rather than theoretical authority, thus allowing anyone to speculate and predict on various occurrences. The ability to attain logical answers to natural mysteries simply from the

observation and examination of the world removes the possibility of phenomena being attributed to the power of God. For example, being able to describe the fundamental properties of hot and cold or wind and sound, which Bacon does, compromises the possibilities that these natural histories also occur due to the will of God. From Bacon's capacity to synthesize natural occurrences and formulate his own explanations, answers, and predictions, all of which do not include God, suggests that there must be another cause: Nature. The inductive principle allows for men and women to observe firsthand the cycles of the natural world, make predictions about it, and ultimately formulate conclusions that will allow them a kind of authority. Critic Desiree Hellegers states that:

> despite Bacon's assertions to the contrary, the 'truths' that would be gleaned from studying the Book of Nature are, for Bacon, consistently identified with insight into the means through which the individual elements of nature can be controlled and manipulated. (42)

This control over the elements that Hellegers points out is exactly what was once ascribed to the divine. The ability to gain knowledge about the natural world through observation and then use that understanding to manipulate events for more favorable outcomes is Bacon's goal. This ability to predict aspects of how the world works makes him a kind of omniscient being. This infinite ability to continuously learn and predict the once-unknown mysteries of the world gives Bacon an amount of power that he would ostensibly confer upon James, making the learned, scientific man a crucial addition to society. More importantly, for Bacon though, it is when he strives to align his own scientific agenda with religion that the King truly considers him a necessary advisor. Bacon uniquely uses religion to cement his own position close to the King. Furthermore, Hellegers goes on to state that:

> Bacon's conception of natural law specifically precludes divine eruptions in the natural order, the experimental strategies of Bacon's new apostles will serve a function similar to the miracles performed by Christ and the apostles, enabling them to 'subdue' not simply nature but also skeptical and implicitly political resistance to the authority of God and king. (43)

It is interesting how Hellegers' extreme view likens Bacon and the followers of his scientific thought with Christ and His Apostles. From the capability of the inductive principle fostering answers that are undoubtedly true because they can be continuously tested, Bacon and his followers achieve status above the common man, as well as above charlatans and alchemists, who relied heavily on magic and chance. Truth can be initially found by a single, human man and then retested with the same results by anyone.

Bacon attributes a "lack of method," to the faulty structure of knowledge that is in place without the inclusion of natural philosophy. Bacon states that "no great progress [will] ever be made in science by means of anticipations" (202). In essence, a discovery cannot be made by assuming results as truth without testing or seeing recurring outcomes. Ezequiel De Olaso in his essay *Hobbes: Religion and Ideology* suggests that "[Bacon] is the first to point out that man is a captive of his lack of method, because he tries to investigate nature on the basis of natural preconceptions…He thinks that we start with preconceptions that are strong enough to determine our acceptance of them" (64). What De Olaso calls preconceptions are basically assumptions. When wanting to find an answer to a natural occurrence, people already have an idea of what the outcome may or may not be and they let that "preconception" influence and rule the result. Bacon calls for a more neutral process in order to lessen and eliminate the bias in order to obtain truer findings. Critic, Paula Findlen, also comments on this "lack of method" issue suggesting that "lack of method, as Bacon defined it, had led to the undisciplined state of

current knowledge" (242). However, she suggests that "discipline [is] a means of narrowing the enterprise. Without it, the natural philosopher could not recognize the true laws of nature" (242). For Findlen, her evaluation of Bacon's *Advancement* lies in its call for a restoration and order through discipline, which checks and eradicates chance and assumptions.

In order for Bacon's natural philosophy and inductive reasoning to hold an unswerving and serious place in society, he must discredit other early tactics of technological advancements and does so in the *Advancement*. A rejection of alchemy is at the heart of Bacon's reformation of knowledge in order that more honest and credible scientific advancements aid the daily life of man. By the end of the 16th Century alchemy had become increasingly popular. Discord over what exactly alchemy was and what its goals should be arose. Tara E. Nummedal in her article *Practical Alchemy and Commercial Exchange in the Holy Roman Empire* suggests that there are two sides to this disagreement. The first sought to use alchemy as a way of understanding God through nature with the hopes of reversing the effects of the Fall. The second view looked at alchemy in pragmatic terms. The second view ultimately seems to be more convincing due to the commercial use of alchemy and the growing market for it. Alchemical knowledge operated and was defined in terms of utility and profit. It didn't matter if the concocted potions or herbs actually worked or cured the ailment of the patient, the potential of a cure drove its popularity. Money and material gain is the primary goal of a majority of charlatans. There were a very small number that may have appreciated more intellectual or spiritual aspects of alchemy, but these considerations were consistently secondary to making certain that the general public purchase and believe in the false

talents of the alchemists. Pamela H. Smith and Paula Findlen, in their work *Merchants and Marvels*, state that practical alchemy was:

> a means to generate profits, whether through the sales of books, recipes, processes, or the application of those processes to large-scale mining enterprises. This was primarily a utilitarian use of alchemy, aimed ultimately less at the production of broad hypotheses about the natural order than at understanding how to manipulate nature in order to make it more prolific. (211)

The description of the position of medicine and aid in early England shows how greatly in need society was of reorganizing and structuring learning. Bacon was looking for definitive hypotheses with definitive answers, which alchemy was not always able to provide. One of his many convictions was to break down these swindlers and offer the people answers that they themselves could see, test, and ultimately rely on. The quote suggests that, alchemy aspires to afford the public with more fruitful ends to understand the world better and thus use it to public advantage, but the fact that the knowledge coming from this skill is not credible negates the possibility of it ever providing productive outcomes. The phasing out of this branch and the focus on more reliable and sound methods is most vital in placing the science that promotes natural philosophy and inductive reasoning at the forefront of society.

In *The Advancement of Learning*, Francis Bacon reconstructs the process of knowledge, whereby human kind can better understand and use the natural world. His vision changed the daily life of the common man and woman, which is why he's considered one of the earliest thinkers of the scientific revolution. Although he attempts to hold his religious values with his passions for science, he ultimately devalues the place of religious thought in the scientific community. Furthermore, Bacon's own political place in society additionally diminishes and cheapens his air of piousness. However, the

advancement of Bacon's inductive principle and rejection of the practice of alchemy both aid in creating a solid structure of knowledge that will allow the methodologies of scientific inquiry to flourish.

Chapter 2

Bacon's *Confession of Faith*, published in 1641, embodies Protestant principles of faith while at the same time perpetuating the evolving scientific thinking of the time. It is interesting to have in one, solid document an example of the competitive nature between religion and science. The structure of the *Confession* itself is representative of the scientific process due to its logical coherency and calculated movement through topics. Critic James Spedding notes that the "general sequence discusses God, the Creation, and Christ" (561). However throughout Bacon's discussion on these topics, scientific references and Bacon's own ideas on natural philosophy seep through. The struggle present in this text strongly mirrors Bacon's own personal struggle with religion and science, which begs the question: why call this work a confession? Typically, confessions are an account of one's beliefs told to an authorized person of religion. However this writing is not private, nor does it solely deal with religion. Professor Basil Hall writes, "I cannot think of anyone writing a Confession as Bacon did. Men left papers with an account or even a summary of their religious ideas but did not call them a Confession. Bacon here is to my mind unique" (561). It might not be incorrect to suggest that this piece of writing is rather Bacon's own repentance for the guilt of being more a man of science rather than the religious man he was brought up to be. It is my aim to focus closely on the Creation section in particular that Bacon discusses and the moments where he strays from his sanctimonious tone and reflects more on scientific beliefs. From these moments, I hope that it becomes apparent not only that Bacon is at odds with himself over these two issues of faith and science, but more importantly that Nature and its relationship with man is the central area where this conflict takes place.

During the dialogue on the Fall of Adam and Eve, Bacon purposefully uses a metaphor from geometry to explain the order of nature. The mathematical concept Bacon deploys in his writing explains the relationships between the Trinity and the created beings of God. His unique approach of combining religion and mathematics is a signal of two competing issues: one, that Bacon must be well versed in both ancient and evolving mathematical principles, which only a subscriber of science would be in order to even parallel it with the creation story; and secondly, that he struggles with separating science and so uses it to make sense of the world around him. He attempts to explain and interpret the ideologies of Protestantism in his own terms in order to build them together more tersely and meticulously. In the *Confession*, Bacon states:

> [O]ne person of the Godhead should in time be united to one nature and to one particular of his creatures: that so in the person of the Mediator…God might descend to his creatures, and his creatures might ascend to God [and] all the virtue of the Mediator; which is the great mystery and perfite centre of all God's ways with his creatures, and unto which all his other works and wonders do but serve and refer. (107)

The mathematical metaphor here is more specifically of a geometrical nature as well as an astronomical. Bacon's explanation of God at the center (Godhead) with angels, man, animals, and lesser creatures all revolving around Him and the Mediator (Jesus) connecting the levels of creation directly correlate with the ideas of Copernicanism. Nicolaus Copernicus was the first astronomer to formulate the concept of the sun at the center of the universe rather than the Earth, thus affirming the idea of a heliocentric cosmology. Critic Gary B. Deasen in his article *Reformation Theology and the Mechanistic Conception of Nature* states that "the widespread application of mathematical methods to the physical world is the single most significant change made by the seventeenth century scientific tradition" (167). Thus, Bacon is using the

developments of his time to change the discourse about God and religion and talk about it in newer terms. Here, he has placed God as the sun with His various creations revolving about Him. The initiative of Bacon to express his faith in scientific terms suggests that the *Confession* might not in fact be what its title implies, but rather a demand for understanding the natural world through science, not religious faith.

From Bacon's explanation that the ordering of nature mirrors the heliocentric theory, man is placed as the most special of God's created beings, which ultimately leads to humankind's sense of entitlement. In the book of Genesis, it is stated that God said, "Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground" (Genesis 1: 25-27). From this it is easily seen that man stems from the direct lineage of God and specifically created to rule over other creations on Earth. In some ways it as if man is the god on earth. This exact suggestion that man was made to rule over the world fosters a sense of entitlement over the natural world, which will ultimately grow into the scientific man's desire and need to fully understand and manipulate that natural world to fit his will. Stemming from dominance, a sense of entitlement is created and fostered. Bacon states in his *Confession*:

> That He chose (according to his good pleasure) Man to be that creature, to whose nature the person of the eternal Son of God should be united; and amongst the generations of men, elected a small flock, in whom (by the participation of himself) he purposed to express the riches of his glory; all the ministration of angels, damnation of devils and reprobate, and universal administration of all creatures, and dispensation of all times, having no other end, but as the ways and ambages of God to be further glorified in his Saints; who are one with the Mediator, who is one with God. (108)

The placement of humans as His most celebrated constructions is evident through sending Jesus Christ to be the Savior of mankind. Bacon suggests that God chose for man to be united with his Son. The fact that Christ is both sent to and made into a human in order to save the race suggests that God not only loves mankind, but favors them as well. Furthermore, it is suggested that mankind is made in the specific design in which God is able to display His own glory. According to the Bible, man was made in God's own image and likeness, unlike any other creation. More to the point, there are a select few of the human race who are truly in tune with God's will (saints) and through these individuals mankind is further elevated to be understood as favored above all others. Even the angels were slighted when God created Man in His image and likeness. The apostle and theologian Peter writes in the New Testament that "[i]t was revealed to them that they were not serving themselves but you, when they spoke of the things that have now been told you by those who have preached the gospel to you by the Holy Spirit sent from heaven. Even angels long to look into these things" (1 Peter 1:12). The position of humans in the next world is actually higher to the position angels because humans are mortal. With this discourse in mind, it is not difficult then for man to begin to look at himself as blessed, thus entitled to some sort of freedom or liberty within the world he inhabits. Once again, it is exactly through these perceptions that man becomes the dominant creature on Earth and exploits the position.

Due to God's preference for his creation of humans above all things, as well as the subsequent sense of entitlement from this preference, the power of man over the natural world is able to take shape. It is obvious that God created man with the virtues of reason, understanding, prudence, judgment, and so on whereby these endowments elevate

humankind. However, from these assets the privilege of free will inevitably hangs in the balance because humans can choose to do evil. Bacon states:

> He made all things in their first estate good, and removed from himself the beginning of all evil and vanity into the liberty of the creature; but reserved in himself the beginning of all restitution to the liberty of his grace; using nevertheless and turning the falling and defection of the creature, to make way to this eternal counsel touching a Mediator, and the work he purposed to accomplish in him. (108)

Through free will man had the power to attain eternal life, but a desire for knowledge corrupted his own blessing. Bacon makes a special point that not God, but rather man created the institution of evil on Earth and it will always be man's employment to combat evil on Earth and restore order. It is precisely the "restitution to the liberty of his (God's) grace" that man needs to order Nature (Bacon 108). The ordering of Nature allows daily life to go on reasonably and smoothly; and it is Bacon's sole purpose in all his scientific discussions to alleviate the hardships of man in daily life. Bacon's concern then obviously becomes for the laws of nature and how they order the universe. Critic Stanley L. Jaki in his book *The Road of Science and the Ways to God* states that the faith needed by science and scientists is a "faith in the enduring rationality of the cosmos made sense only as long as the world, its laws, and (not least) its constants, were *given* in the deepest ontological sense" (180). For the rational man, the only way the world can turn and unfold, the way it should is if all the laws of nature are being upheld and, more to the point, as long as man is in control of those laws.

From man's innate sense of dominance over the natural world, Bacon's own belief in natural philosophy, which is intrinsically scientific, becomes intertwined within his pious *Confession*. For Bacon, man's dominion over nature can only be understood through a reformed natural philosophy. From his new system of logic, understanding and

manipulating the natural world is made easier, which in theory reverses the Fall of Adam and Eve. Bacon states,

> God created Man in his own image, in a reasonable soul, in innocency, in free-will, and in sovereignty: That he gave him a law and commandment, which was in his power to keep, but he kept it not: That man made a total defection from God, presuming to imagine that the commandments and prohibitions of God were not the rules of Good and Evil, but that Good and Evil had their own principles and beginnings, to the end to depend no more upon God's will revealed, but upon himself and his own light, as a god; than which there could not be a sin more opposite to the whole law of God: That yet nevertheless this great sin was not originally moved by the malice of man, but was insinuated by the suggestion and instigation of the devil, who was the first defected creature, and fell of malice and not by temptation. (109)

As it has been previously noted, mankind was made in the image and likeness of God and bestowed an amount of power, which was lost when Adam and Eve ate the apple of the Tree of Knowledge. Bacon points out that man "lusted after the knowledge" because of his own reasoning that Good and Evil were "their own principles and beginnings," which according to Bacon is false. Good and Evil are inextricably tied to God and His law. Thus the desire and success of man to penetrate God's law to an extent and learn of Good and Evil forever imbeds humankind with a seeded ambition to want to know all. It is Bacon's desire through science to attempt to give man exactly what caused the Fall: knowledge of the world. Bacon's natural philosophy consists of procedures for isolating the form of nature, or cause, of a phenomenon in order that man may advance his own position. Bacon is attempting to supplant the religious tone of the *Confession* by promoting his own call for natural philosophy by stating that it is through man's own "light" that humankind can act as a god, and since humans are made in His image and likeness it is not impossible. Critic John Henry in his book *Knowledge is Power* states, "the claim of Bacon's that has often been presented as most irreligious in its import is his

insistence that natural philosophy and religion should always be kept separate" (85). It's interesting that specifically in his *Confession*, which is religious by nature, Bacon would take the time again to introduce the theory of natural philosophy. Henry further suggests that "Bacon insisted that the study of the natural world had been blighted by a troublesome and intractable enemy – namely, blind immoderate religious zeal" (85). It is not surprising to find that the concept of religion and the practice of science threaten each other, but it is surprising to see this struggle surface in a confession of one's faith. It seems correct to conclude that Bacon's work here might not actually be a profession of his religious faith, but rather a way to rationalize his own pursuits of learning.

In conclusion, Bacon's underlying concern throughout *Confession of Faith* is with natural philosophy and the laws of nature. Ultimately, the religious voice of the 'confession' is overshadowed and undermined by description of the regular recurrence of natural and physical phenomena (scientific laws). Bacon is looking for a religious voice that can accommodate the scientific method, but is unable to find it. Bacon's *Confession* seems more a way to rationalize the productivity of society, rather than actually being a profession of devout faith. Through Bacon's parallel between religion and mathematics, humankind's sense of entitlement, the power of man over the natural world, and his continued alignment with natural philosophy, the *Confession* becomes a kind of logical, rational, and at times scientific work. Bacon is the first to discuss religion in these scientific terms and much of that is due to the evolving knowledge of the scientific revolution. However, the fact remains that ultimately what is at stake in this work is Bacon's own struggle between the religious and scientific dichotomies that loom throughout the text. Much of the *Confession* is a mapping out and working through of

Christian doctrine and how it either sustains or compromises scientific ideologies. Ultimately, it seems that scientific, natural laws end up the victor in this battle.

Chapter 3

For Francis Bacon, understanding the natural world comes from a kind of dualism or relationship between God and science. Many of his writings as a philosopher and early scientist struggle with the complex relationship that exists between faith and scientific knowledge. Bacon's continual study as a learned man centers on attempting to uncover discoveries of the world, while at the same time upholding and remaining a man of faith. The concept of nature is one of the many topics that he seeks to understand both religiously and scientifically, but struggles to do so. Faith allows one to enjoy and experience God through nature and visa versa, enjoying nature as a reflection of God. On the other hand, science offers man numerous possibilities of what one can do to alter nature to better improve human lifestyles. The notion of a garden, in particular, is a medium that wholly expresses the vital bond between God and the natural world, but is also able to be manipulated and worked to become a product of the human imagination. Bacon believed, as the Bible states, that humans are made in the image and likeness of God. Thus placing the first man and woman (Adam and Eve) into a garden elevates the place into a heaven on earth. Immediately, the garden can be seen as having a religious importance and significance as well as being a kind of missing link that connects humans to their faith. It is important to note, the kind of garden being referenced here is one that is natural, wild, unchanged by modern human innovation. The Garden of Eden that Adam and Eve were placed into was untamed, full of greenery, flowers, trees, and life. It is only after the Fall that God commands Adam "to till the ground from whence he was taken" (Genesis 3:23). Laborious work on the soil in order to provide food seems to be one of the many consequences Adam and Eve face due to eating the apple of the Tree of

Knowledge. From the separation that is made between the unchanged garden (Eden) and the changed, worked garden (subsequent gardens that are to be forever tilled by man), the previous notion of the garden as a kind of heaven on earth is greatly weakened. Only uncultivated, natural places are those in which humans can find God, which is not at all prevalent during the time of Francis Bacon. One of the joys of the 16th-Century was the meticulously planned gardens that displayed the wonder and awe of human capabilities. No area or piece of land during the days of early England was left free for untamed growth. Many places were being farmed, used for roads, to build town and cities, and to display the greatness of noble gardens. Human dominance over the natural world was heavily taking shape. Francis Bacon's essay *Of Gardens* reveals how unbelievably focused man's desire to dominate nature was at the time due its centrality of botany, mathematics, and the architecture of a "princely garden" (Bacon 432).

Bacon continually gained and strived toward an acquisition of natural knowledge based on observation and experimentation, which is highly visible in *On Gardens*. The explanations on the optimal growing seasons of trees and plants stem from Bacon's own viewing and monitoring of the life around him. The recurring approach of using human reason to "classify data and to draw conclusions from facts in order to formulate 'laws' to which natural phenomena appeared to conform" was in fact revolutionary for the time since it refined the knowledge of 16th Century England (Stearns 293). The awareness and categorical skills that are present in the writing of the essay are exemplified in the statements Bacon makes about winter and floral aromas:

> For December, and January, and the latter part of November, you must take such things as are green all winter: holly; ivy; bays; juniper; cypress-trees; yew; pine-trees;…[then in the Spring,] the breath of flowers is far sweeter. That which above all other yields the sweetest smell in the air, is

> the violet, specially the white, double violet, which comes twice a year, about the middle of April, and about Bartholomew- tide (August). (430-431).

The ability not only to recognize the growth patterns and habitual appearances of certain plant life, but the extensive lists of various species found in the Plantae Kingdom is remarkable and advanced. The separation of the months of the year and the corresponding lists of trees and flowers that flourish during a specific month was at one time thought to be a miracle of God. There was never an adequate and refined scientific explanation for this kind of life cycle. Although Geoffrey Chaucer was the first to subscribe to using the five senses in order to perceive one's world, he did so in order to develop imagination and express his characters' states of mind, whereas Bacon relies heavily on his observational skills in order to account for why nature acts the way it does. For example, Bacon questions why the forests are bare in the winter and full of life in the spring and summer. The uses of one's skills and senses to better understand and predict how the world around him works, subsequently, allows one to consider how then to restructure the world in order to make daily life easier for humans. For one to recognize that observation produces solutions and then to capitalize on this in order to advance human use of the natural world is the foremost dictum of science. Bacon's further observations of aromatic pleasures during the summer months affords him, and all men and women, the capability of expressing what odors exuding from a specific flower would be most strong and effectual at any one time. It is through the implementation of the empirical approach that God or any other sort of divinity is not needed or considered in understanding the growth patterns of greenery. In the past, families continually struggled to ensure a good harvest and would pray or sacrifice, which was thought to

please a divinity. However, with new innovations man is solely able to deduce facts from his own observations in order that man-made gardens will adhere to optimally pleasing one's senses. No longer do humans have to guess and hope that the earth will provide for them. They can make sure of this and thus secure survival. In a sense, man has taken the prosperity of his own life away from the superstitions of religion and set it in his own power.

Gardening is foremost improved from the discoveries made through the use of the empirical approach, which allows for various certainties and 'laws' of nature to be formulated. The classification of plants into groups has played a significant role in scientific progress, especially in the area of biology. Charles Webster, author of *The Recognition of Plant Sensitivity by English Botanists in the Seventeenth Century*, writes that "[a]lthough Bacon made only scattered original observations on plants, he had an important influence on English botanists" (10). Throughout *Of Gardens*, the leading feature of the essay is the extensive listing and ordering, which Bacon takes a great deal of time to do. Classification is widely used today as a means of condensing and linking the multitude of species in the world. However, during the early 16th Century, most botanists were more interested in the medicinal properties of individual place, rather than an overarching classification system. Eventually, toward the late 16th and early 17th Centuries men such as Andrea Cesalpino, Caspar Bauhin, and John Ray began to divide plants into types based on fruitification structures and common characteristics (Bihrmann). The implementation of the mode of taxonomy was crucial to viewing the movements of plants. From these extensive lists, later scientists as well as Bacon himself were able to know when to monitor specific plants in order to see movements and signs

of life, which is the first step in differentiating plants from animals. It is obvious that he was naturally aware of the many plant movements simply from witnessing flowers blooming and growing taller. However, in order to explain why the movements would occur, plant taxonomy was consistently used in order to improve the understanding of gardening and botany in scientific terms.

Additionally, Bacon's method of listing is just one of the many scientific approaches he employs throughout his works. Florian Cajori, in his article *The Baconian Method of Scientific Research*, states:

> Bacon ranks as the earliest prominent methodologist of scientific inquiry. He represents an effort to proceed beyond the rude and slovenly inductive procedure…Bacon insists that men should mark when they miss as well as when they hit. (86)

Any findings or anomalies are worthwhile on the path to innovation, which Bacon realizes at a very early stage. Both the use of an ordering system and the persistence in documenting findings are the earliest catalysts for the modern scientific arena to grow. More closely, however, Bacon's own time benefits from his observational discoveries in that the practice of gardening becomes more deliberate. From this essay, gardeners in the 16th Century could now plan extensively what trees and flowers should be set in particular places for the most favorable outcomes all year round. For example, holly trees that survive both the winter and the summer would be set as perimeter walls in order that the shape of the garden is continually preserved throughout the year. The use of shrubbery and hedges, which also last year round, would be planted in order to make pathways and designs within the garden walls. In part due to Bacon and his diligence in gaining knowledge, gardens of early England have become not only well-known, but considered works of art.

Bacon's essay not only deals with plant taxonomy and growth patterns, but, in fact, includes much about mathematics and architecture. In the second half of the essay, Bacon sets out to explain to his readers how a 'princely garden' should be made. Bacon takes into account gardens of his day that were considered to be most royal and luxurious and states that "[f]or gardens, the contents ought not well to be under thirty acres of ground; and to be divided into three parts; a green in the entrance; a heath or desert in the going forth; and the main garden in the midst; besides alleys on both sides" (432). At first, this call for over thirty acres of land seems to be an arbitrary number and solely suggested due to the mere amount of space thirty acres occupies. However, the dimension is both precise and deliberate.

Figure 1 – Ariel of a portion of King Henry VIII's Hampton Court

Thirty acres is ten times the size of Henry VIII's Hampton Court and four times as big as the Great Garden at Theobalds. Bacon's call for the garden to be divided into various parts of use is very much a trademark of the Tudor/ Stuart style garden. The use of *compartimenti*, or compartiment, originated in the late 15th Century in Italy and

"functioned as autonomous design units…usually in groups of four or eight, to make a symmetrical and harmonious whole" (Jacques 32). Theobalds was made up of "nine compartments and a second or little garden which was quartered and each compartment quartered again" (Strong 5). The construction of compartition itself is actually an art form in layout design, i.e. architecture.

Figure 2 – Lord Burghley's Great Garden at Theobalds

The use of compartments and divided areas in gardens are early transitions from building architecture to structural design that includes the outdoors. Jacques goes on to say that "the compartmented system dominated the gardens of the sixteenth century across Europe [and] the compartmented system is best seen as a new concern for order and harmony rather than as the invention of a new vocabulary of garden components" (35,36). Once again, the need for order and systems, just like Bacon's dealings with taxonomy, dominates the gardening world, quite literally.

The water systems of Tudor gardens, as well as 16th Century gardens, are also extensively discussed by Bacon, and are highly represented in the presence of fountains,

pools, and ponds. Specifically, in Bacon's own familial estate residence of Gorhambury, there is an extensive water working system which was created to resemble the fountain systems at Theobalds and Hatfield House.

Figure 3 – Water works at Hatfield House

In early Tudor England, ponds and water workings were gradually incorporated into gardens and, eventually, became mandatory facets of high status, noble gardens. At Hampton Court, just "west of the privy garden was the pond garden with three square ponds of different sizes" (Henderson 117). As the century progressed, water became a kind of obsession. Critic Roy Strong documents the start of using water works in gardens, stating that "the origins were [from] medieval ponds and castle moats for ornamental effect which led on to enclosures like the Pond Garden at Hampton Court" (6). The incorporation of ponds were becoming so popular that whole *compartiments* were dedicated to the display of them, as seen at Hampton Court. Bacon goes to great lengths to expound upon the beauty of ponds and water works, but also admonishes those who will not maintain and keep the water fresh, saying that:

> they are a great beauty and refreshment; but pools mar all, and make the garden unwholesome, and full of flies and frogs [if] the water [not] be in perpetual motion, fed by a water higher than a pool, and delivered into it by fair sprouts, and then discharged away under ground. (433)

At the Gorhambury estate, Bacon included a moat and streams to run along the interior of the garden surrounding the large summer home. Lime trees were placed one by one around the square perimeter of Gorhambury with multiple walkways and paths on the outside of the pond. All the walkways led toward one entrance which had a bridge to connect to the house. Bacon elaborately included a mill to the left side of the garden in order to keep the water continually in flux so as not to become stagnant. The use of the mill was indeed revolutionary seeing as it was both cost effective and traditionally used for large scale public projects, versus Bacon's private use.

Additionally, the fountains and pool at Theobalds are among the most famous incorporation of water works into gardens. The large pool was supplied by water from two miles away and was brought to the height of the pool by lead pipes that flowed straight into it through the mouths of two serpents creating a fountain. The pool itself was approached by 24 steps leading to its bank and once again, wooden water mills were placed at the two furthest points of the pool in order to keep the water in motion (Henderson). Not only were the water works and the pools of the gardens a staple of early English imagination, but also a testament to the capabilities of the scientific spirit in England. All the improvements made to the gardens of the day reflect the growing strength of science and learning in English society. The progress made with the design and construction of gardens is just one example of what this advancing society could accomplish.

Along the longest sides of the pool, Lord Burghley had twelve white marble statues of Roman Emperors erected. Lord Burghley extends the focus of his water garden to the intellectual facets and components of life and history through the more visual, philosophical, and ostensive statues he places around the pool. Critic Paula Henderson comments on Burghley's inclusion of the Roman statues stating that:

> the garden as the setting for intellectual and philosophical discourse was common from ancient times. Certainly the busts of the Roman emperors at Theobalds, statues of gods and goddesses, and esoteric inscriptions in some banqueting houses were meant to stimulate thoughts of the glories of ancient Rome, which by association reflected the glories of Elizabethan England. (69)

The presence of marble artwork at Theobalds, and many other gardens, elevates not only the individuals who can afford to place these masterpieces in their homes, but also elevates the concept of the garden itself, but solely in materialistic terms. Marble statues are best known for their presence in churches and places of religious worship. Thus having these icons in gardens should send the message that gardens are places for religious thought as well, however it does not work. To be naturally amongst God's earth would be most ideal to succumb to religious influence, but rather individuals are forced to feel that they should pray or look for God in a domineering, papal sense surrounded by these overbearing statues. The religious aspect is still present, but in a more authoritarian circumstance versus a path that is more organic. Seventeenth Century poet Andrew Marvell talks about gardens in religious terms stating that "my soul into the boughs does glide:/ There like a bird it sits, and sings,/ Then whets, and combs its silver wings;/ And, till prepared for longer flight,/ Waves in its plumes the various light" (114). Marvell introduces the notion that gardens are a way to self transcendence. The first garden, as Bacon also notes, is the Garden of Eden, thus the suggestion in Marvell's poem that the

closest place to Paradise on Earth is a garden itself. Marvell calls for gardens to be private places where an individual can find solitude and God.

The main garden, or great garden, of these extensive lands as a whole is the true evidence of the centrality of gardens in early English culture. The great garden usually was meant for spring and summer time due to the inclusion of a multitude of flowers and plant life which fully bloom in the warmer months, versus including plant life aimed at blooming in the winter. The great garden was typically the central point of the parameter of the whole garden, but at the same time was the smallest *compartiment* in size. The great garden was meant for private time either alone or with others and served as a sequestered abode. Many times, in order to reach the main garden, individuals had to find their way through the knots. Bacon calls for his ideal main garden to be "ranged on both sides (with fair alleys)…and some pretty tufts of fruit trees, and arbours with seats, set in some decent order; but these to be by no means set too thick; but to leave the main garden so as it be not close, but the air open and free" (434). The main garden at Hampton Court is lined on all sides with a multitude of colored flowers. A brick walkway leads into the garden and is lined with stone cherubs and at the center of the *compartiment* is a tiny pond. There is one walkway all around the main garden that is enclosed on both sides with the various flowers. The gardens are meticulously planned by man, yet made to look natural. These detailed arrangements are the products of man's desire to control nature.

Figure 4 – The Main Garden at King Henry VIII's Hampton Court

Theobalds' great garden, twice the size of Hampton Court, is made up of seven miniature knots and has an assortment of cherry trees and flowers growing wild. Inigo Jones was the surveyor for the site of the great garden at Theobalds as well as for the entranceway to the garden as a whole. The west and east sides of the Theobalds' great garden have graveled walkways lined with 240 sycamore, lime and elm trees (Andrews). The main gardens were places where man- made nature was the foremost feature.

Knots, or maze labyrinths, also bring an intricate feature to the formation of gardens, adding to both the pride and innovation of early Modern England. Tudor knots are an interlacing of design through the use of bushes and hedges that act as walls, in order to create winding pathways that would lead toward the center and the outside of the garden. Italy widely used labyrinths both large and small in gardens dating back to the late 15th Century. The published designs of Italian labyrinth architect Serlio were featured at Hampton Court. The Hedge Maze of Hampton Court, as it is formally called, contains half a mile of paths and covers a third of an acre.

Figure 5 – Ariel view of Hampton Court Maze

Figure 6 – Layout Drawing of Hampton Court Maze

At Gorhambury, Bacon set lime and birch trees in the form of a circular maze. In the essay, he states that "knots may lie under the windows of the house [so] you may see good sights" (432). The detailing of knots are obviously sights to behold, thus having these mazes nearer to the house in order that from a window an individual can see the detailed pattern is telling of the pride that having these advanced art forms brings to the people.

Figure 7 – Portion of Labyrinth at Theobald Palace

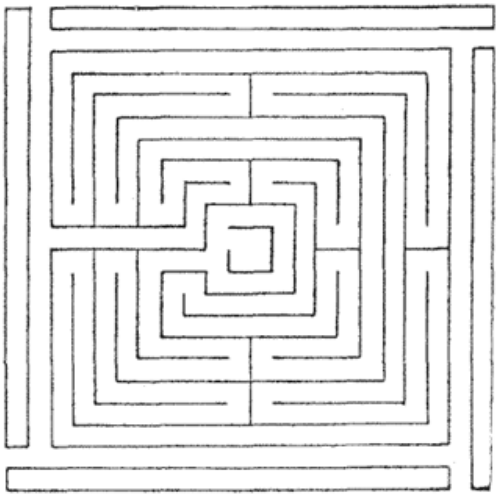

Figure 8 – Layout Drawing for Labyrinth at Theobald Palace

This sense of excessive pride that the people of early England had for their innovation of knots and labyrinths to gardens completely diminishes the presence of God within the modern garden. 16th Century writer, statesman, and philosopher, Thomas More, writes in his book *Utopia* –

> one single monster, the prime plague and begetter of all others [is] Pride. Pride measures her advantages not by what she has but by what other people lack…Pride is a serpent from hell which twines itself around the hearts of men; and it acts like the suckfish in holding them back from choosing a better way of life. (84)

Scientific advancements implore a sense of pride in men. The ability to explain occurrences in the natural world give man an advantage over other creations and the pleasure inherently found in knowing things fosters the pride that More is vigilant against. As seen earlier in Bacon's *Advancement of Learning,* science again can be compared a kind of serpent. Humans work and create, not solely for improving their own lives and the lives of others, but also in order that they may stand back and admire the work and accomplishments, which yields pride. For Bacon to suggest that labyrinths and knots should be placed prominently so that they can be seen from estate windows in order that men and women may stare and gawk over their accomplishments is wholly degenerative of the holy status gardens could hold.

As exemplified by Francis Bacon's essay *Of Gardens,* humankind can and will conquer and order nature. Man is in full control and understanding of the laws of nature, and is thus able to command them. The earth is for human consumption and use. The vital connection between God and gardens no longer exists in early England. Bacon states at the opening of his essay that "God Almighty first planted a Garden. And indeed it is the purest of human pleasures" (430). However, the natural, wild Garden of Eden was the first and last pure garden. The influential scientific spirit and the abounding knowledge of botany separate God and religion from the concept of the garden. The garden reflects the binary battle that Bacon faces: choosing between religion and natural philosophy, yet, at the same time, blends the dichotomy between religion and natural philosophy in a way unobtainable by Bacon. Bacon's technical and systematic tone and discussion in *On Gardens* damages the triptych relationship that once existed between God, pre-fallen man, and the pure, unaltered garden.

Conclusion

The writings of Francis Bacon are filled with science, philosophy, and religion and the ways in which these areas interact with one another. Bacon was heavily influenced and interested in natural growth, but at the same time set out to control that growth. In the *Advancement*, Bacon advocates increasing knowledge through the introduction of natural philosophy and inductive reasoning. He strives to align learning with Scripture in order that the reformation of knowledge increases his own material gain and position in society, in order to consequently influence King James I of England. It is the combination of the fundamental separation that exists between science and religion, as well as Bacon's own ambitions in society that demonstrate the weakness of attempting to understand these two competing doctrines in reference to one another. In the *Confession*, Bacon uses the discoveries of his time in order to explain the ordering of nature. He specifically imitates the heliocentric theory when explaining Creation. Due to these appearances of science in, what is supposed to be a religious confession it seems that Bacon is more greatly influenced by science, rather than religion. Furthermore, the reordering of knowledge and nature is a way in which early modern men and women could potentially reverse the effects of the Fall. Through observation and experimentation, knowledge of the cycles of the earth could be monitored, thus allowing man to manipulate it. Through a garden, but more accurately through a controlled garden, humankind can find a way to heaven. Yet it is this exact issue of the control of knowledge and of the natural world that ultimately manifests into the tension between God and science. All the scientific discoveries made through taxonomy, mathematics, landscape design (knots/labyrinths), the construction of water works throughout the

outdoor grounds, and other various developments fueled the growing scientific spirit of England. Unlike John Milton's garden in *Paradise Lost,* which was overgrown causing anxiety due to this over proliferation, Bacon was able to fix this issue through ordering and delineating what he observed in the natural environment. However, Bacon is at pains to uphold both sides of science and religion since the two doctrines are fundamentally at odds. Through the examination of three of his texts, *The Advancement of Learning, A Confession of Faith,* and *Of Gardens* the tension throughout Bacon's personal life as both a religious and scientific man are brought to light. Bacon's desire to control nature creates an illusion that early modern men and women could reverse the effects of the Fall. Though, ultimately, scientific knowledge undermines the religious faith Bacon attempts to uphold.

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Figure 1. Ariel of a portion of King Henry VIII's Hampton Court. <http://3.bp.blogspot.com/_2o0-SyVcxis/RyTYNiNGloI/AAAAAAAAAdE/8TY-w80JfsE/s320/Hampton%2BCourt%2BGardens.jpg>

Figure 2. Lord Burghley's Great Garden at Theobalds. <http://www.gardenvisit.com/assets/madge/tem5170seg21/original/tem5170seg21_original.jpg>

Figure 3. Water works at Hatfield House. <http://www.myhouseandgarden.com/garden/images/Hatfield%20House.JPG>

Figure 4. The Main Garden at King Henry VIII's Hampton Court. <http://www.plantsgalore.com/gardens/uk/images/Hampton-Court-2003-02.jpg>

Figure 5. Ariel view of Hampton Court Maze. <http://www.math.nus.edu.sg/aslaksen/gem-projects/maa/Interview_with_the_Minotaur/Hampton_Court_Maze.gif>

Figure 6. Layout Drawing of Hampton Court Maze. <http://www.twickenham-museum.org.uk/images/medium/HamptonCourtMaze.jpg>

Figure 7. Portion of Labyrinth at Theobald Palace. <http://www.gardenvisit.com/history_theory/library_online_ebooks/ml_gothein_history_garden_art_design/elizabeth_i_nonsuch_theobalds>

Figure 8. Layout Drawing for Labyrinth at Theobald Palace. <http://www.gutenberg.org/files/16713/16713-h/images/mzfig11.png>

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