

DIVINE ALCHEMY IN *PARADISE LOST*

by

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This thesis was prepared under the direction of the candidate's thesis advisor, Dr. Thomas Martin, Department of English, and has been approved by the members of her supervisory committee. It was submitted to the faculty of the Dorothy F. Schmidt College of Arts and Letters and was accepted in partial fulfillment of the requirements for the degree of Master of Arts.

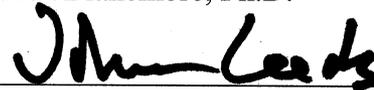
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ABSTRACT

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This study examines the themes of alchemy and transformation in *Paradise Lost* and seventeenth-century thought. Beginning with an overview of the historical roots of alchemy, this study analyzes the ancient, underlying philosophical concepts that marital union produces the birth of the soul and that destruction is necessary for this birth. Alchemical references identified in *Paradise Lost* include animal lore and direct alchemical images, which demonstrate Milton's knowledge of alchemy and his deliberate use of the alchemical metaphor. These themes support the proposal that Milton, a Christian humanist, uses alchemy as a metaphor described in this study as "divine alchemy," which begins with his belief that Christians, inheriting original sin, must submit themselves to a transformative process similar to transmutation to restore right reason and, ultimately, achieve salvation.

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INTRODUCTION

The words “alchemy” and “philosopher’s stone” evoke archetypal images of something ancient and mysterious: encoded texts; primitive laboratories with blazing furnaces and brewing caldrons; stoop-shouldered sorcerers and their young apprentices; and of course, the transmutation of metal to gold, yielding not only perpetual youth and unlimited wealth, but a panacea for universal ills. According to the *OED*, alchemy relates to the early field of chemistry and appears in literature from the fourteenth through nineteenth centuries, but the term was passed from ancient texts going back over two thousand years and continues to be used in the twenty-first century in metaphoric and symbolic ways. Several major English literary figures have been fascinated by alchemy, including Chaucer, Donne, and Jonson, and although there is no hard evidence that Milton himself practiced alchemy, there is evidence that his friend Andrew Marvell did (Flannagan, *Riverside* 326). Milton, an ardent student of all subjects, including science, includes repeated references to alchemy in *Paradise Lost*, which raises the question of their purpose in the text that is so devoted to his theology.

Several researchers have analyzed Milton’s use of science, particularly to debate whether Milton preferred old versus new science: Svendsen analyzes the old science in Milton’s works and compares Milton’s beliefs with other Christian humanists (Flannagan, *Riverside* 233), whose beliefs editor Roy Flannagan calls “Christian holism, or the Christian attempt to synthesize all learning under a scheme controlled by

providence or God's will" (325). In contrast, Edwards challenges the characterization of Milton's science as backward science and finds ample evidence that, in fact, he was "responsive to the latest intellectual and stylistic currents of the day" (203). Despite these studies, most researchers ignore references to alchemy and, more importantly, fail to discuss why Milton used these references or examine the relationship of alchemy to Milton's religious beliefs.

The structure of this thesis contains three major divisions. The first chapter provides a background overview of alchemy and the alchemical process with particular emphasis on the attitudes toward alchemy by the seventeenth century. The second, third, and fourth chapters analyze three types of alchemical symbols and metaphors found in *Paradise Lost*: marital union, animal lore, and chemical transformation. The fifth chapter concludes with a discussion of how Milton, a Christian humanist, uses alchemy as a metaphor for his theology. This interpretation, which could be called "divine alchemy," begins with Milton's belief that Christians, inheriting original sin, must submit themselves to a transformative process similar to transmutation to restore "right reason" and ultimately, achieve salvation. This study will show that in the alchemical metaphor, spiritual transformation begins with fallen man (similar to a base metal), who must search for truth by suffering tests of faith (being disassembled and reconstructed in the experiment), and with God's grace and the mediation of Christ's sacrifice (alchemical purification), man is rewarded with eternal life in heaven (the philosopher's stone).

CHAPTER 1. OVERVIEW OF ALCHEMY

The history of alchemy begins with the Aristotelian theory that everything in nature consists of varying proportions of the same elements: earth, water, air, and fire. According to this ancient theory, these elements are in constant flux; a substance grows, decays, and disappears as the elements within the substance change from one form to another (earth to water, water to air, air to fire, and fire back to earth again). From this belief developed the underlying acceptance that death must precede birth before the physical and chemical properties of matter could be disassembled and rearranged into another form. In addition, alchemists accepted the theory that everything in nature has a prime form, which determined all the characteristics of the substance, and that everything in nature strives for the perfection of that form. The beginnings of alchemy start with the study of these elements, and through the centuries, theories evolved that attempted to unlock the mysteries of the elements and how they changed.

Paul Foote's study of the scientific basis for alchemy provides insight into the scientific reasoning behind the alchemical experiments. Transmutation from one physical substance to another occurs every day and has always been observable in nature: caterpillars change into butterflies, ice into water, and food into bodily flesh. Each of these creations (i.e., the butterfly, water, and body) demands the destruction or death of something else. Early scientists reasoned that if ice can become water, then it is plausible that one metal, supposedly a compound of certain elements in certain proportions, might be changed into another metal of the same compound but with

different proportions of elements. Thus, alchemists reasoned, lesser metals (including silver, copper, mercury, tin, iron, and lead) could achieve the same perfection as gold, which, given sufficient time, would happen naturally in the earth.

The beginnings of modern chemistry originated from the alchemists' desire to hasten this transmutation in the laboratory by forcibly breaking down and redistributing the elements within metals. Mercury, a liquid metal, was considered sufficient proof that metal could, in fact, become a watery "vapor," and that with sufficient heat and additives, all metals would melt. Furthermore, with the precise experimental process (additives, timing, temperatures, and so on), they could be transmuted into gold. This reasoning was considered so believable that it wasn't until the end of the eighteenth century that a better understanding of chemical elements launched new insights into atomic structure and disproved forever the ancient theories of alchemy.

The desire for transmuting metal to gold seems to have originated over two thousand years ago with the conviction that gold is the most stable of all metals, and that its stability is the result of a mixture of the four elements in such perfect proportion that the elements cannot be separated. For example, as early as 270 CE, the philosopher Plotinus in his *Fifth Ennead* used gold as a model of the highest standard of purity, of which copies could only crudely approximate its purity and permanence:

Only from itself can we take an image of it; that is, there can be no representation of it, except in the sense that we represent gold by some portion of gold—purified, either actually or mentally, if it be impure—insisting at the same time that this is not the total thing gold, but merely the particular gold of a particular parcel. (176-77)

In this passage, Plotinus uses gold as an example of an archetype found in nature, thus demonstrating that ideal beauty is found in the real world as a manifestation of the Platonic forms, as opposed to the strict Platonic belief that that the real world is only a copy of the forms.

Gold was the perfect candidate for alchemical transmutation because of its color, luster, rarity, and, of course, for its universal economic value: Gold coins have been found dating back to 700 BCE, and gold became the official standard for England's monetary system by the end of the seventeenth century. Although no successful transmutations have been recorded throughout the history of alchemy, its practice was banned in 1403 by King Henry IV in an apparent effort to maintain the status quo and create a stable economy and coinage system: "It shall be a Felony to use the Craft of Multiplication of Gold or Silver" (Tomlins 257). John Levin's study of the impact of alchemy on seventeenth century British economy finds that this law was the first of several laws to ameliorate the very real and growing problems of devaluation of coins, counterfeit coins, and common fraud, including gilding coins made of lesser metals with gold to pass them off as solid-gold coins. Despite the ban, however, British monarchs, including both Henry VIII and Elizabeth I, secretly patronized alchemy in the hope of finding infinite wealth and the elixir of immortality. By the seventeenth century, practitioners of alchemy, sometimes referred to as hermeticists or adepts, kept their names and experiments shrouded with obscurity in hieroglyphic texts, not only to avoid arrest but to confound competitors.

While alchemy was known to have been practiced in laboratories in the Mideast for centuries, the popularity of alchemy in European mainstream society by the

seventeenth century might have begun with the legend of Nicholas Flamel. According to Allison Coudert, who researched the origins of alchemy, this legend stems from records reputedly written in the late fourteenth-century. According to the records, Parisian Nicholas Flamel, after a lifetime of sacrifice and dedication to alchemy, was successful in transmuting mercury into pure silver and then into pure gold, providing him with vast wealth which he bequeathed to charity. Despite the fact that the books attributed to Flamel were later found to be sixteenth- and seventeenth-century forgeries, the seed was planted in the imaginations of scientists and non-scientists alike who cultivated the vain and desperate hope that the alchemical process could be successful, if only the precise combination of experimental procedures could be derived.

Interestingly, Flamel has acquired a measure of immortality by his fictional appearance in popular literature, including Victor Hugo's *The Hunchback of Notre Dame* and J. K. Rowling's *Harry Potter and the Philosopher's Stone*, which was retitled in the United States as *Harry Potter and the Sorcerer's Stone* because editors assumed youthful American readers would be unfamiliar with alchemy and would be skeptical of a book with "philosopher" in the title.

Coudert stresses, however, that not all alchemists were frauds or fools, and for a time, mainly the Medieval and Renaissance eras, Western Europe was the hub of alchemical experimentation. Historical names such as Cornelius Agrippa, Albertus Magnus, and Paracelsus are just a few of the known European figures who devoted their lives to practicing and publishing books about the pseudo-science of alchemy, often combining their studies with medicine, religion, and natural philosophy. Their

alchemical experimentation ultimately resulted in notable contributions to medical practices and early understandings of chemistry.

By the seventeenth century, the practice of alchemy was dwindling, but alchemical metaphors had worked their way into poetry and literature. For example, in 1610, Ben Jonson's play *The Alchemist* is framed around the subject of alchemy and the alchemical process, which he weaves into both comedic and moral themes. In 1633, John Donne's "The Good Morrow" extends the logic of the elemental combinations into the poetry of love:

Whatever dies, was not mix'd equally;
If our two loves be one, or thou and I
Love so alike that none can slacken, none can die.

Donne's metaphor references the alchemical transformation: Achieving the perfect combination of elements requires death and destruction, but when successful, the result is something everlasting and complete. Jonson's and Donne's references illustrate how alchemical theory had assimilated into the popular culture of Milton's time. By 1667, when *Paradise Lost* was first published, the dark and mystical imagery behind alchemy provided a rich, well established context from which authors could draw to develop themes of transformation through death and resurrection as well as themes of fraud and greed.

Francis Bacon, another contemporary, is openly skeptical of alchemy, but does not dismiss its contribution to some areas of science. In *The New Organon*, published in 1620, he states: "The alchemist cherishes an eternal hope, and when a thing does not succeed, he holds his own mistakes responsible" (70). For Bacon, alchemists are men

who have “a passion for fables” (149) and proceed under the illusion that it is only their timing and proportions that must be corrected, and thus live with the hope that their experiments will eventually achieve the desired end. Yet despite his skepticism of the goal, Bacon concedes that “alchemists have discovered quite a few things, and given men useful discoveries” (71). This attitude exemplifies the ambiguous reputation of alchemy in Milton’s era, and more importantly, portends the transition from ancient philosophy to the new science and the pre-scientific revolution. Ironically, alchemists might have focused more on Bacon’s advice to search for truth through experimentation as encouragement to continue with their application of the ancient theories to alchemy and might have taken to heart, despite their experimental failures, Bacon’s prediction that “the road to human knowledge and the road to human power are very close and almost the same” (103).

Milton, like Bacon, has a profound interest in the natural sciences and believes in the need to investigate nature so that natural resources can be used for the benefit of mankind. Both are known to attack Aristotelian deductive logic and studies of hierarchical cosmology as too speculative and a useless exercise. In addition, they are in agreement that the study of science would lead us to an awe of nature, and perhaps (at least for Milton), ultimately to God, the Creator. However, the two men differ in how they view the relationship between theology and natural science. Bacon finds it is necessary to “insulate science from religion, in order to advance the former” (Gair 121), and he becomes more concerned with actual methods of research. Milton, on the other hand, “subordinates scientific fact to the truths of spiritual enlightenment” (122). His increased awareness of how natural science demonstrates the Creator’s divine plan

drives this interrelationship in his written works through metaphors, analogies, and technical details. Milton is unwilling to ignore or separate God's ever-present influence in nature and considers Bacon's materialistic atheism as a "philosophical absurdity" (123). From his studies of natural science, Milton develops an interest in alchemy at a minimum for its metaphorical symbols in his poetry and prose which will be shown later in this study.

A brief look at the alchemical process itself is needed to understand the nuances of literary metaphors, including those used by Milton in *Paradise Lost*. Alchemical methodology in the seventeenth century can best be illustrated by Sir Isaac Newton, considered the last credible scientist to experiment with the secrets of alchemy. Up until late in his life, it was known that he kept "a cauldron stocked with odd ingredients" (Christianson 54). Drawing from ancient scientists whom he called "Alchemicals," he passionately joined the search for the philosopher's stone, also known as the "grand magistry," "grand elixir," and many other names. Presumably, it was called a stone because of its transformative influence on ordinary stones, that is, it could turn them into precious gems. According to legends, this stone would possess mystical powers: When mixed with other metals, it could produce gold; when drunk on a regular basis, it could produce immortality.

Like other alchemists, Newton believed that Greek philosophers, medieval scholars, and important figures from the Bible hid their knowledge of how nature works in symbolic language. Like his predecessors, Newton was convinced that the legendary stone had magical powers, but his writings show that he was more interested in learning everything there was to know about the behavior of matter, from "the smallest particle

to the grandest star” and was searching for “the key to the universal matter that would explain the very structure of the world” (Christianson 56-7). Newton, like other alchemists, theorized that the basis for the fabled transmutation was in the physical characteristics and compounds of matter. Unlike Newton, however, most alchemists led wasted lives, squandering all their money on experiments and resorting to astrology and fortune-telling to escape starvation (White 116), and thus sully the reputation of the entire endeavor. The full alchemical process, as determined by early scientists, could take years of experimentation, requiring substantial equipment and materials.

According to White’s research into the history of alchemy, the twelve general stages of an alchemical experiment began by grinding the metals to their smallest particles, followed by “calcination” (the reduction by fire to a powder). The powder was dissolved with an acid for up to six months to make sure they were completely mixed. This mixture was then “putrified” as the mixed ingredients started to turn black. They were “sublimated” (mixed with other compounds) using distillation, heating, blending, and dissolving again in acid. This stage was a dangerous process that produced toxic fumes that, in unventilated labs, could produce poisoning or madness. In this stage, the alchemist evaporated the solvent and reconstituted the material through distillation, which was the process of separating mixtures within boiling water through glass alembics and collecting the distillates as the mixture cools. The distilled material was then removed from the distillation equipment and added to an oxidizing agent, making it again highly volatile and dangerous and added the risk of explosion.

Finally, the mixture was hermetically sealed in a special container, which was delicately warmed and then cooled. This fabled stage was necessary to produce a white

solid, called the White Stone, which was theoretically capable of transmuting base metals into silver. This would presumably be followed by another purification process to produce a red solid, called the Red Rose or Red Lion, which would lead to producing the ultimate substance, the philosopher's stone, a mythical material that could transmute any substance into pure gold.

In very general terms, the goal of the process was to break down the metals, destroy their atomic structures, and reunite them into a new, purified form. Alchemists used symbols to encrypt and encode the objects they represented; every color, shape, and element had meaning. Although alchemy was carried out in secret laboratories, the vocabulary of alchemical symbols became common among texts, as well as in many myths and religions and eventually transferring to literature and art and even to related fields including numerology, mathematics, astronomy, and music. In *Paradise Lost*, Milton draws on common alchemical symbols and language as part of his poetic form and structure, particularly those relating to marital union, animal lore, and chemical transformations, which will be reviewed in the next three chapters.

CHAPTER 2. ALCHEMICAL IMAGES USING MARITAL UNION

The first alchemical image of this study, marital union, was widely used in ancient alchemical texts to depict the process of merging male and female elements (sometimes expressing the union of the chemicals sulfur and mercury), to produce the purified child, or gold. In alchemical legends and art, the earth is considered the fertile mother, inside which stone “embryos” gestate and are born, sometimes with human parents. The laboratory vessels are pictured as wombs or eggs, and the philosopher’s stone is the royal child. Birth (resulting from marital union) and death are the two most widely used sources of imagery in alchemy (Coudert 111-16). These same symbols are seen in early natural philosophy in Plato’s ideas about the immortal soul. Although Plato (through Socrates) teaches in philosophical abstractions, his idealism and rationalism became the enduring foundation of science for nearly two millennia. This chapter begins by reviewing two prominent works of Plato, *Phaedrus* and *Symposium*, to examine Plato’s philosophy about the formation of the soul and the purpose of marital union and interpret his philosophy as support for alchemical experimentation. This chapter then reviews a work more nearly contemporary with Milton, *The Chemical Wedding of Christian Rosencreutz Anno 1459*, also from an alchemical perspective.

Looking first at *Phaedrus*, this study will focus on Plato’s ideas about the nature of the soul, its corruptibility, and the inexorable need to restore itself to its divine nature. In his second speech, Socrates makes an *a priori* assumption that the soul was

put into motion at the prime origin, and therefore, since the soul did not come into being, it must also be self-generating, and thus, immutable and immortal:

All soul is immortal; for what is always in motion is immortal...

Moreover, since it does not come into being, it must also be indestructible... It inevitably follows that the soul is uncreated and immortal. (49)

Researcher Dougal Blyth analyzed the logic in this passage and other passages in *Phaedrus* by constructing Aristotelian syllogisms. He finds convincing philosophical support for the concept that the soul's constant self-generating motion and constant change culminate in the philosophical proof that "what moves itself is indestructible" (Blyth 212). He concludes that Socrates's logic provides a symbolic representation of the human condition when separated from its divine nature. The argument also explains how vague reminders of the soul's former divine state can spur it to regain its original capacity. Although this myth is dependent on the assumption of that divine nature, Socrates builds on it to arrive at implications for the human soul, most specifically through the allegory of the winged charioteer and his dual nature.

Socrates states that souls start out immortal, existing on the upper core with the gods and in full view of the cosmos and the unchanging forms (*Phaedrus* 52-53). In this familiar allegory, the eternal and immutable gods exist in the outer, highest realm of the cosmos. Existing with the gods in this realm are the universal forms of good, beauty, wisdom, and all the divine qualities that feed the souls. Socrates illustrates this immortal soul as a winged charioteer whose chariot is pulled by two horses. The soul's task is to drive the chariot around the globe and return to the summit with the gods. The function

of his wings is to keep the racing chariot in flight while it travels around the outside of the globe and returns to the arch of the heavens and the ideals of true goodness and knowledge. The charioteer, however, is less than a god and can put only his head above the surface as he passes the summit of the arch and contemplate the pure intelligence and knowledge that exists above. There, he assimilates his proper food and is satisfied with his vision, albeit limited, of absolute reality and absolute knowledge, demonstrating that the divine nature in the soul is drawn inevitably toward perfection and goodness. Examining this belief from an alchemical perspective, alchemists extended Plato's logic to physical matter and found support for the belief that, like the charioteer existing in the heavens with the gods, matter originates in the "quintessence," referring to the fifth "essence" or element, which is a state of perfection that occurs with the optimal combination and proportion of universal elements. Although introduced here, the concept of the quintessence will be discussed more fully later in this study.

Plato's myth continues by illustrating the soul's precarious, dual nature, which struggles with opposing forces for balance and transcendence. To complete his global circuit, the charioteer (representing the intellect of the soul, or reason) must direct two horses, one good and one bad, which strain powerfully in different directions and challenge his strength and ability. The bad horse, symbolizing the physical appetite and temptations of the flesh, has a violent nature that can drag the driver and chariot down in the direction of the earth. The good horse, full of spirit and nobility, strains to move the chariot high and away from the earth. If the charioteer drives a steady course, an exceedingly difficult task, he celebrates his immortal existence each time he completes circling the globes to share again the divine vision of the gods. However, if the

charioteer loses control of the horses, he immediately forfeits his position with the gods; he loses his wings, falls to earth, and puts on a mortal body, keeping only a dim memory of wings and flight.

In this fallen state, the soul now exists in the physicality of a body, giving it the dual essence of immortal soul and mortal body. Due to the heaviness of the body and the absence of wings, the soul is unable to rise and fly and has lost the vision of the reality it once gleaned. All former visions of beauty and goodness are forgotten, other than subtle urges to seek beauty and goodness on earth. The fallen, wingless soul is no longer fed absolute knowledge from the realm of the gods, but instead it is fed “mere opinion” (53) of earthly mortals deprived of truth. Plato’s expression of an immortal soul from within a mortal body can also be referred to as a living being, a man, or a mortal soul now mired in earthen soil. In this state, man is both resourceful (drawing from his divine nature) and needy (drawing from his appetitive nature). Once the soul enters the body of an infant, the quality of the man’s initial life and the decisions made during that lifetime determine the fate and condition of his reincarnation. Theoretically, a virtuous life lived in pursuit of philosophy is rewarded with a good reincarnation, while a life lived pursuing sensual pleasure results in a reincarnation to a reduced state. Like mere illusions of the ideal forms, human bodies are imperfect and will die and decay before being reborn into another life. This cyclical degeneration and regeneration reflect not only the corruptibility of the body, but its ever-moving soul and its instinctive longing to return to its divine state, themes mirrored in the beliefs of alchemists.

The myth describes how the immortal soul now joined to its mortal body will undergo a 10,000-year cycle of reincarnations with the ultimate goal of redeeming himself enough that his wings re-grow sufficiently to take flight again. Because of the limitations of the body and his nearly forgotten memories of the upper realm, the solitary soul cannot reach his former divine nature; instead it is *eros* (a sexual desire) for the “beautiful boy” that stimulates the memory of the form of beauty. After the initial attraction, if the man allows himself to fall in love with the boy, he becomes inspired and obsessed with the beloved and neglects other earthly family and possessions, initiating a state of sickness and a flood of longing (like a madness) for his former elevated state and the pursuit of knowledge. The man, like his former charioteer state, must control his competing urges as he approaches the object of his desire. His rational nature, like the good horse, has excellent, honorable qualities that need no restraint. His appetitive nature, however, like the bad horse, has reckless qualities and a willful disposition; this nature seeks to drive the man to further corruption and sensual indulgence. This concept of a corruptible soul supports the alchemical belief that base matter is a similarly corrupted form of an essence, gold, that has lost its prime form.

As the mutual love between the admirer and his beloved grows, it becomes a stream of beauty which moisturizes and stimulates the shoots of feathers and re-growth of wings, thus filling the soul of the admirer and the beloved with divine love. However, the lovers are fated to suffer from divinely inspired madness and experience the dualities of pleasure and pain, friendship and passion, and enjoyment and distress. The two natures of the soul continue their fight, one indulging in jealousy and possessiveness and the other moderating with modesty, respect, and reason. If the lovers

are mutually successful in moderating their dual natures, they are rewarded with a life of happiness and virtue:

So, if the higher elements in their minds prevail, and guide them into a way of life which is strictly devoted to the pursuit of wisdom, they will pass their time on earth in happiness and harmony. (65)

With newly grown wings, the admirer and his beloved can ascend to the upper realm, victorious from their divine madness and restored to their purer, immortal form. In this image, the two entities (admirer and beloved) are irresistibly drawn to each to undergo a chaotic and nature-altering transformation and achieve a divine reward. This stage of spiritual madness leading to transformation supports alchemists' belief that a similarly violent disruption of corrupted matter is required for transmutation.

Although Plato's allegory focuses on the human soul and is based on philosophical assumptions about the opposing natures within the soul, it lays the foundation for similar assumptions about the nature of the human body and matter itself, a fundamental premise for alchemy. The human body (or more relevant to this study, a base metal) represents the corrupted soul, similar to the charioteer who could not control his opposing drives. As a result, the mortal body (or base metal) yearns to restore itself to its former order and position of power and control, undergo reincarnations, recall the forms, and become once again a divine soul. To regain his immortal state, man must be continually inspired by love and beauty, expressed through an innate need for companionship, beauty, and goodness. Love becomes a divine madness, a "state of frenzy" (47), in which the lovers struggle to control their senses.

The soul's reincarnations demonstrate the cyclical nature of existence and the transformations that are needed to restore the order and perfection of the divine form.

For the next two thousand years, alchemists continued to apply Plato's philosophical allegory of the reincarnation and transformation of the soul to their beliefs in the potential for physical transmutation. In the alchemical metaphor, the divine soul represents the immutability of the philosopher's stone. Alchemists fundamentally assumed that all entities are composed of living particles that are joined together to represent a solid whole, and when in a corrupted state (like the fallen charioteer), these qualities should be broken apart and forced into a new distribution of particles. Base metals represent the corrupted state of gold because they have lost their prime form (just as the charioteer lost his spiritual form), but which could be forcibly reordered and restored to their perfect organization; however, in this case, the transformative process is initiated by the alchemist. Like the incarnations required by the earth-bound soul to reach its ideal state, base metals require a similar cycle of death and rebirth in the laboratory, resulting in a redistribution of elements to achieve its intended purified state of transmuted gold.

Looking at the second work of Plato, *Symposium* provides another compelling connection to alchemy by its expanded discussion the marital union and the birth of the soul. In this work, the classical seer Diotima informs Socrates that human beings are attracted to goodness, and they want goodness to be theirs forever. She maintains that this need is the manifestation of ideal love, and because of this need, "every human being is both physically and mentally pregnant" (48) with an inherent desire to express his love through procreation. People in love become manic in their devotion to each

other and experience a type of madness to express their love. She explains to Socrates that sex between a man and woman can result in the birth of a mortal soul that also achieves immortality for the man and woman. Diotima stresses that as two people search for mates, they are attracted by beauty and compatibility in the other; through their attraction, they transcend their human nature and develop in each other a permanent, spiritual quality of goodness: “We desire immortality along with goodness, and consequently the aim of love has to be immortality as well” (49).

The quality of the creation, Diotima continues, revolves around the ideal of beauty. Reminiscent of the madness experienced by a fallen soul when in the presence of the beautiful boy, Diotima says that proximity to beauty elevates the madness to a divine state, meaning that ideal beauty plays a part in both the fate of the lovers and the pregnancy that results from the expression of their love. Diotima’s definition of “pregnancy” goes beyond the traditional, physical sense to include a mental state of potential or possibility that is experienced by men, her sole audience. When pregnancy is surrounded by ugliness and unhappiness, it results in barrenness; the “child” remains unborn and suffers badly. When the pregnancy is pleasant and surrounded by beauty and happiness, the pregnancy is “swollen, ready to burst” (49), and the beauty surrounding the birth makes the birth free of agony, and the birthed child is born happy. Thus, in the presence of beauty, the attraction to each other is made immortal by the divine birth of the child, another immortal soul. Diotima reminds Socrates that the same argument exists even for animals in nature. Mortal nature strives for immortality through procreation to replace past generations with a new one; but only in humans,

who are part divine and part mortal, can the birth result in a divine soul and ascend to goodness.

Diotima's claim that all love is, by nature, procreative does not imply that all creations produce mortal souls. If the man is attracted to a woman and their love is manifested in producing children, a physical pregnancy results. However, if this man's mind is far more pregnant than his body, called mentally pregnant, his nobler offspring is "virtue, especially wisdom" (52). Mentally pregnant men have a love of philosophy and are opposed to the bodily love incited by women. Their creations can include self-discipline, philosophy, and justice, which enable men to manage political and domestic affairs. Men who are mentally pregnant long to procreate and give birth, but must search for beauty in others to find a soul-mate with a mind that is attractive, upright, and gifted, such as the beautiful boy. The man then undertakes the education of the boy (as described in *Phaedrus*) and their intimacy gives release to the creativity resulting from his mental pregnancy. Diotima asserts that this type of union and procreation is far superior to physical childbirth, and it is the poets of antiquity (such as Homer) who best exemplify this principle: They created poetic works of great beauty for mankind and achieved the immortality of fame.

Again, Plato's allegory lays the foundation for similar assumptions about the alchemical process. When alchemists viewed the entities of matter with a Platonic perspective, they concluded that particles of nature, like men, are intrinsically drawn to each other to procreate and regenerate. There exists an optimal combination of particles, an ideal mixture of "male" and "female" elements, each with opposing forces that must be controlled and subdued by the alchemical experiment to produce a harmonious

marriage. The transmuted entity will resemble the purity of the divine soul as the godlike child, gold. The task of the alchemist, then, is to identify the correct male and female elements needed for the transmutation of base metals to gold and find the proper environment, chemicals, and catalysts for the union to take place. Like the wingless charioteer cast down to earth to suffer incarnations, base metals must suffer a series of incarnations in the laboratory and eventually restore the purity that nature intended and produce a perfectly harmonious combination leading to the ideal beauty of the philosopher's stone and the elixir of immortality.

It must be noted that by Milton's era, several philosophers were openly skeptical of using Plato's philosophy as a hypothesis for any area of science. For example, in *The New Organon*, Francis Bacon, just as he warns against alchemy, also warns against the practice of seeking knowledge through old philosophies and labels them "idols of the theatre" (42). He claims that "the wisdom of the Greeks was rhetorical and prone to disputation, a genus inimical to the search for truth" (58). Bacon, like John Locke and Thomas Hobbes, encouraged the separation of science from other branches of philosophy, so as to remove theology, Aristotelian (syllogistic) logic, and old science from the arena of new scientific experimentation and discussion. This skepticism, however, did not deter dedicated alchemists from their dependence on ancient philosophy as the fundamental premise behind transmutation.

Despite the waning belief in the physical potential of alchemy, its imagery continued well into the seventeenth century. One of the most prominent examples of seventeenth-century literature incorporating the theme of alchemical marriage is the *Chemical Wedding of Christian Rosencreutz Anno 1459*, written in Dutch in 1616. The

work was written as a series of dreams and depicts an initiation ritual with a procession of tests, purifications, death, resurrection, and ascension required for Rosencreutz, founder of the Rosicrucian Movement, to assist with “the Royal Wedding.” Beyond the obvious religious overtones, this work has been interpreted from many levels, including alchemy, where the series of rituals has been interpreted to symbolize the purification ritual of transmutation to alchemical gold. After Rosencreutz endures the cycle of transformations, he is finally named by the king as a Knight of the Golden Stone, a thinly veiled reference to the philosopher’s stone. According to Coudert, the book is “basically an alchemical fantasy, using the idea of fusion (or marriage), death, and resurrection to describe the hero’s spiritual rebirth” (94). One of the prominent symbols in the book is the *Monas Hieroglyphica* (shown in Figure 1) drawn by alchemist John Dee, consisting of all the astrological and alchemical signs in one simple figure that “embodied all powers of the universe” (94). The symbol includes the signs of basic elements and all the signs of the planets, which represents a spiritual alchemy of all the powerful elements of the universe fused or married into one, culminating in assimilation similar to transmutation itself.



Fig. 1. “Monas Hieroglyphica.” *Wikipedia: The Free Encyclopedia*. Wikimedia Foundation Inc. 11 May 2012. Web. 8 Aug. 2012.

All these classical and modern images of marriage are present in *Paradise Lost* when Adam and Eve enjoy a nuptial commitment to each other in the garden and, after the Fall, express their forgiveness, recommitment, devotion to each other and to procreation. They join together to endure their punishment, fulfill God's prophesy of revenge on Satan, and carry hope to their progeny. As Adam begins to comprehend the enormity of their Fall and the violent disruption it has inflicted upon the world and their future in that world, he sees the road to redemption in his loving spouse:

...Peace returnd

Home to my brest, and to my memorie

His promise, that thy Seed shall bruise our Foe;

...Yet now

Assures me that the bitterness of death

Is past, and we shall live. Whence Hail to thee,

Eve rightly call'd, Mother of all Mankind,

Mother of all things living, since by thee

Man is to live, and all things live for Man. (11: 153-161)

In this passage, Milton stresses the importance of marriage for the production of children, but even more importantly, he emphasizes that marriage strengthens and fortifies both partners to face their challenging future as companions, just as he argued nearly twenty-five years earlier in *The Doctrine and Discipline of Divorce*. His divorce tract defends man's right to divorce as a way to preserve the dignity of marriage and the dignity of the human soul, for without "the union of peace and love," there can be no marriage. He describes the need for a harmonious companion who can satisfy more than

lustful “burning” (sexual need). Instead, marriage should satisfy the need for “conjugal fellowship,” which he calls a “rational burning” (the spiritual yearning for a compatible mind) and which results in love that is “stronger than death” and a marriage that glorifies God (136). Here, Milton’s terms “burning” and “union” have not only religious and moral significance, but they also provide an early parallel with the language of alchemy; the laboratory furnace temporarily usurps the role of mother earth and is described as the mother or womb that marries the ingredients, develops a fetus of a new material, and gives birth to the immortal stone (Coudert 114). Whether this parallel was intentional or not at the time, it becomes more significant when viewed with the cumulative number of alchemical images in *Paradise Lost*.

To summarize this chapter, Plato’s ideas about love restoring man’s divine nature and marriage that gives birth to something immortal are reflected in both alchemy and *Paradise Lost*. This union is reflected in alchemical imagery by complementary male and female chemicals used to produce the golden child. Similarly in *Paradise Lost*, following their corruption through sin, Adam and Eve recommit to their marriage and strengthen the integrated soul that gives birth to the purified Child who can complete the cycle of transformation with man’s redemption, as will be discussed in more detail throughout this study. The next two chapters focus on the alchemical images that appear in *Paradise Lost*, demonstrating Milton’s knowledge and use of alchemy to develop his themes.

CHAPTER 3. ALCHEMICAL IMAGES USING ANIMAL LORE

Building from ancient, enduring theories of the creation, death, and rebirth of matter, the alchemical “philosophers” developed secular theories of how these phenomena occur and interact in the natural world. Nature was not merely a mechanical or unthinking environment; instead alchemists, like all philosophers, believed that every being in nature had a personality imbued with feelings, and they held an underlying conviction that “the world is alive and striving for perfection” (Coudert 108). To protect the secrecy of their personal ideas and how each one integrated with commonly held alchemical theories, alchemists encrypted their notes using symbolic imagery from the natural world, drawing from commonly accepted personality traits of each object or being. Every illustration in alchemical texts represented a concept or idea. Animal figures, in particular, were popular to represent alchemical concepts; for example, an animal might represent a stage of an alchemical experiment or the equipment used during that stage. The same animal lore seeped into other types of writing, including literature, and more pertinent to this study, into *Paradise Lost*. This chapter will focus on three significant examples of animal imagery used in alchemy that Milton also incorporates into the animal lore of *Paradise Lost*: the lion, eagle, and serpent.

The symbolism behind some animal imagery originates with the concept of the Great Chain of Being. This concept is a “common structure of the world which, through the Middle Ages and down to the late eighteenth century, many philosophers, most men of science, and indeed, most educated men, were to accept without question” (Lovejoy

59). With God as the Absolute Being and Creator, the Chain of Being is an ontological scale on which every being is graded according to its degree of perfection. At the top of the chain, closest to God, are the ranks of spiritual beings: angels in order of their power and responsibility, all representing spirituality and divine intuition. At the lower end of the chain are the ranks of physical beings: animals, plants, and finally minerals.

Animals are ranked in the order of their power and intelligence; plants in order of their size, strength, and ability to regenerate; and minerals in order of their solidity and strength. At the center of the chain is man, the knot that ties both ends; man has both the physicality of the lower end and the spirituality or rationality of the upper end: “Man’s major resemblance to God is in his reason” (Muldrow 84). The chain is a conventional scale upon which many literary relationships have been built and from which many literary symbols, images, and metaphors have been derived. In his classic review of the Chain of Being and its influence on cultural thought, Arthur Lovejoy begins with the premise that the history of ideas and the history of science developed in parallel with each other and permeated thought and culture. He traces the Chain of Being back to Plato and Aristotle and through the medieval and Renaissance authors. The concept culminates with German philosopher Gottfried Leibniz, whose principle of hierarchical ordering and law of continuity (Rescher 74), established in the early eighteenth century, substantiate the concept’s pervasive influence in philosophical thought during Milton’s lifetime.

The influence of the Chain of Being with its hierarchical order of animals is highly evident in alchemical myths, which primarily focus on selected animals at the top of various levels in the hierarchy. Specifically, these are animals that symbolize

power, freedom, or transformation in illustrations and texts. Although they have varying names and physical, often mystical, characteristics, common themes emerge.

The lion and the eagle are two of the prominent animal symbols for the key ingredients in the alchemical process and, at times, for the philosopher's stone itself. In animal lore, they represent the highest forms of their levels on the animal hierarchy because of their nobility and ability to devour prey. Lions are renowned for their fierce nature and mastery of their surroundings and sometimes even for their golden fur. In alchemical texts, the lion is variably used to symbolize the philosopher's stone or as a catalyst or ingredient in stages of the alchemical experiment, as described in Muir's study of the history of alchemy:

The alchemists were very fond of using the names of animals as symbols of certain mineral substances, and of representing operations in the laboratory by what may be called animal allegories. The yellow lion was the alchemical symbol of yellow sulphides, the red lion was synonymous with cinnabar, and the green lion meant salts of iron and of copper. (55)

In addition, the lion is used to symbolize the death or destruction of matter. In some illustrations, lions symbolize the spirits or souls that devour each other during the process of transmutation. They are also used to symbolize the process of revitalization of the dead, based on Paracelsus's ancient theory that all lion cubs are born dead, but are raised to life by the roaring of the lion parents.

Similarly, the eagle is considered the king of the sky, representing heaven, light, and spirit. In alchemical texts, the eagle symbolizes ingredients: "Black sulphides were called eagles, and sometimes crows" (55). Capitalizing on both images, the griffon is a

mythological hybrid with the body of a lion and wings of an eagle, capable of traveling great distances on wing and of rendering great power.

Serpents figure even more prominently in alchemical imagery, both for their mystery and their depravity: “The serpent is allegorized in all cultures as a magic force, usually evil, that must be overcome or propitiated” (Svendsen 139). Their annual skin-shedding makes serpents figures of regeneration in art and religions throughout history and throughout the world. Serpents have been used as a symbol of birth and regeneration in the physical, as well as spiritual sense, a dualism that fits with the theme of transformation in both alchemy and *Paradise Lost*. In some cultures, serpents have been the symbol of the union between God and man, and in others the connection between sex and fertility. In contrast to the eagle symbolizing the sky and light, the serpent symbolizes the earth, darkness, and death (Coudert 144). The lion often appears in illustrations devouring a serpent, representing the process of cleansing base matter in preparation for its transformation. The fight between eagles and serpents appears throughout Greek, Roman, and Norse mythology. Furthermore, in alchemical texts, the image of entwined serpents represents the binding or unifying process during the experiment. In this passage, Muir cites a historical text that incorporates animal lore to describe the alchemical process:

The first gate is Calcination... When gold passes through this gate, “We observe in it two natures, the fixed and the volatile, which we liken to two serpents.” The fixed nature is likened to a serpent without wings; the volatile, to a serpent with wings: calcination unites these two into one.

(34)

Serpents, which are closely associated with toads and dragons, represent base matter, which must be “killed,” but not until the “stone” is extracted, and alchemists “played upon both the divine and sinister aspects of serpents in their imagery” (Coudert 145). Alchemical lore describes cutting serpents into pieces, and out of the death comes life, and out of the poison and evil comes the stone. In some early cultures, snake handling was considered not only a religious practice, but one that held practical healing skills: “A trained medical man in ancient times was usually a good authority on serpents, to which great respect was paid in ancient medicine and custom” (Walsh 165).

In *Paradise Lost*, Milton emphasizes man’s role as a steward of nature, stressing the subordination of all animal life to man and the dominance of one animal over another based on the Chain of Being. Adam is superior to all animals in his ability to reason and, therefore, their care is his moral responsibility. Milton treats all animal references, including those from animal lore, with the same respect and reverence that he holds for any of God’s gifts because God’s lessons are eminently evident in nature, which was created for man to rule: “God is immediate and present in human existence and it is through [man] alone that life has meaning” (Gair 142). Milton draws from animal and science lore to demonstrate God’s purpose in the material world and make man more aware of the Creator’s handiwork.

Milton carefully selected science lore from ancient mythology, the classics, the Bible, and multiple scientific encyclopedias to enhance his lessons for his readers. In the creation scene of *Paradise Lost* Book 7, few animals are explicitly named, but the lion and eagle stand out as noble rulers of their habitats at the top of the hierarchical

scale, evoking images of majesty and wisdom, but living in total harmony with other beasts. On day five, God created birds of the air, and first among them is the eagle:

...Soaring th' air sublime
With clang despis'd the ground, under a cloud
In prospect; there the Eagle and the Stork
On Cliffs and Cedar tops thir Eyries build:
Part loosly wing the Region, part more wise
In common, ...
Intelligent of seasons, and set forth
Thir Aerie Caravan high over Seas
Flying, and over lands with mutual wing
Easing thir flight... (421-30)

Milton evokes intelligent and gently soaring eagles among flocks of birds, preferring to fly cloudlike with “mutual wing” for the communal benefit of them all. Fowler’s annotation to this passage suggests that the eagle symbolizes not only majesty, but “spiritual illumination, divine grace, and serpent- or dragon-killing” ability (415), and that the unanimity of movement represents military discipline, without any relationship to seasonal migration because seasons are the result of the Fall.

Likewise, on the sixth day, God creates beasts of the Earth, walking in pairs and already giving birth to newborns frisking in the grass, and first among them is a determined young lion:

Among the Trees in Pairs they rose, they walk'd,
The Cattel in the Fields and Meddows green:...

The grassie Clods now Calv'd, now half appeer'd
The Tawnie Lion, pawing to get free
His hinder parts, then springs as broke from Bonds,
And Rampant shakes his Brinded main... (459-66)

This image of a half-born, yet already sovereign lion cub straining to free itself through birth, possibly assisted by the sun's warmth, reflects the raw power and force in the magnificent young beast, already shaking its mane with haughtiness, yet without any sign of threat toward its fellow creatures. Both the eagle and lion, as all the animals at creation, have an air of prelapsarian innocence.

After the Fall, Adam realizes of the magnitude of his sin and its effect on nature by the arrival these same animals, now predators at the top of a hierarchical scale. In Book 11, he sees the soaring eagle as the "Bird of Jove" (186), the mythical, giant golden eagle that was treated like a god, which in real life is known for hunting live prey. The stalking lion has become:

The Beast that reigns in Woods
First hunter then, pursu'd a gentle brace
Goodliest of all the Forrest (187-89)

These regal animals that represent the pinnacle of creation, now, after the Fall, sweep down upon their prey, aggressive and violent, possessing the qualities that alchemists seize upon to symbolize key alchemical themes. They act instinctively to kill, beginning the postlapsarian cycles of reincarnation.

Milton's griffon, however, in contrast to the godly nature of the mythological creature, becomes Satan's symbol as he sweeps through Chaos toward earth:

As when a Gryphon through the Wilderness
With winged course ore Hill or moarie Dale
Pursues the *Arimaspian*, who by stelth
Had from his wakeful custody purloind
The guarded Gold. (2: 943-47)

Referring to the legendary battles between the ancient, one-eyed Arimaspi and the gold-guarding griffins reported by Herodotus, a historian admired by Milton (Svendsen 146), the now-debased Satan spreads his wings to fly through the Gates of Hell. He tumbles through the wasteland of Chaos to reclaim his stolen (or in his case, forfeited) “gold,” which for him represents the royal gold of the King of Heaven. Flanagan aptly points out that just as the griffin was eventually subdued by Apollo, so also Satan will be subdued by Christ (408), and thereby he will permanently surrender the coveted gold. In his desperation, the still resourceful and powerful Satan creates an artificial kingdom for the fallen angels. As he soars wildly through Chaos into God’s newly created world, brilliant with golden sunlight and abundant with naturally created gold, Satan sees the earth “hanging in a Golden chain” (2: 1050). The multiple metaphors of gold as both innately divine, a divine final reward, and a divinely endowed gift to the earth reinforce Milton’s use of gold as the highest standard in the natural world, equating it with God’s first creation, light. Satan’s futile attempts to possess it or to create either gold or light artificially are as unsuccessful as alchemy, making Satan another failed and frustrated alchemist.

Milton’s serpents have an even more complex purpose in the epic, being at one time the combined images of charm and betrayal, guilt and pride, reality and

mythology, and physical and spiritual metamorphosis. Like the lion and eagle in the creation scene, the serpent, mentioned *last* of the beasts, next to man, is created as not entirely good, but harmless:

The Serpent suttl'st Beast of all the field,
Of huge extent sometimes, with brazen Eyes
And hairie Main terrific, though to thee
Not noxious, but obedient at thy call. (7: 494-98)

The serpent might be inscrutable with the potential for deception, but at this point, it is not a threat to man in his unfallen state. Milton's Satan as serpent reinforces the context of organic and spiritual transformation; however, what he transforms into is evil and monstrous, the antithesis of redeemed man's spiritual transformation to goodness.

Similar to the mutilated serpents in alchemical texts, Satan is cleaved in half during the battle of the fallen angels, but instead of producing the stone, Satan is restored as more desperate and devious. Whether moving among the herds of four-footed animals in Eden, whispering in Eve's ear as a toad, or tempting Eve as a snake, Satan, despite his debasement, shape-shifts with subtlety and resourcefulness, possibly "aided by occult powers" (Edwards 26). Edwards also argues that Satan represents the charlatans of mid-seventeenth century who hawk "exotic new substances for medicinal use" (30), influenced largely by Paracelsus, a famed Renaissance physician, botanist, and alchemist whose disreputable practices had spread to England by 1640. Satan as serpent oscillates between sexual boldness when around Eve and self-disgust when alone. As Satan's followers transform into serpents, their postlapsarian form symbolizes the anti-Christ. Coudert points out that in the language of alchemy, both Christ and the serpent

have been identified with the philosopher's stone, originating with the belief that creation occurs only through sacrifice and death.

Finally, although not explicitly related to Satan, Milton's reference of the *amphisbaena* (10: 524), a legendary snake with a head at both ends, stresses his knowledge of the anecdotal reporting of such far-fetched creatures.

...Dreadful was the din
Of hissing through the Hall, thick swarming now
With complicated monsters head and taile,
Scorpion and Asp, and Amphisbæna dire. (10: 521-24)

The *amphisbaena* (see Figure 2) most likely originates from ancient anecdotal records of exotic species that crept into natural anthologies. Interestingly, this snake was also mentioned 350 years earlier in *The Divine Comedy* as one of the most horrific of God's earthly serpents, yet unmatched by those in Hell:

Let all the sands of Libya boast no longer,
for though she breeds chelydri and jaculi,
phareans, cenchres, and head-tailed amphisbenes,
she never bred so great a plague of venom. (*Inferno* 24: 85-88)



Fig. 2. "Amphisbaena." *Wikipedia: The Free Encyclopedia*. Wikimedia Foundation Inc. 13 Oct. 2012. Web. 14 Oct. 2012

Like Dante, Milton was familiar with both ancient and modern encyclopedias, and from them all, he pulls this image of a snake that he must have known was a physical impossibility (Edwards 87). Researchers have puzzled over its exact purpose and have proposed various meanings, including that it symbolizes horror (Svendsen 35), falsity (Edwards 94), or duplicity and inconstancy (Fowler 568). This study suggests another possibility that relates it to alchemy: Milton might have selected it for its noted resemblance to the ancient circular symbol of the *ouroboros*, a snake eating its own tail (see Figure 3).



Fig. 3. “Ouroboros.” *Wikipedia: The Free Encyclopedia*. Wikimedia Foundation Inc. 21 Sept. 2012. Web. 23 Sept. 2012.

The *ouroboros* dates back to ancient Greek and Egyptian cultures to represent cyclical regeneration or renewal. The symbol is also widely used by alchemists to represent the eternal cycle of creation, destruction, and regeneration (Coudert 142), and particularly “the interrelatedness and reversibility of certain chemical transformations as in ‘distillation’ and ‘condensation’” (Ragai 71). The close association between the *amphisbaena* of science lore and the *ouroboros* of alchemy to represent the cycle of life and death might have been a consideration for Milton and his use of this otherwise obscure snake.

Thus, these symbols from animal lore in *Paradise Lost* demonstrate how Milton reaches selectively into the same rich fabric of ancient symbols as alchemists did to add vivid context to his narrative. Moving now to the heart of this study, the following chapter builds on the historical roots and symbols discussed so far and focuses on the more explicit references to alchemy and the philosopher's stone in *Paradise Lost*, adding even more compelling evidence of the influence of alchemy on Milton's epic.

CHAPTER 4. ALCHEMICAL IMAGES USING CHEMICAL TRANSFORMATION

The philosopher's stone has been described in various alchemical texts as the lion (as mentioned in the previous chapter), and also as "the stone of wisdom, the heavenly balm, the divine water, the virgin water, the carbuncle of the sun, the old dragon, the basilisk, and the phoenix" (Muir 16), making alchemy a commonly accepted metaphor for rebirth, eternal life, and the soul of all things. As established earlier in this study, alchemists found inspiration from the ancient Greek philosophers, including Aristotle's theory of the four elements of matter (earth, wind, fire, and water) and Plato's theory of the cyclical destruction and recreation of life. With these underpinnings, alchemists theorized that all matter can transform both physically and spiritually. Although some alchemists preferred to dwell in the philosophical side of alchemy by extending it to the arts, mathematics, and other disciplines, the most common goal of alchemists was physical transmutation. Basing their studies on the principles of natural philosophy, alchemists believed that metals, like animals and plants, were alive, but in a corrupted form that would keep striving for perfection through cyclical destruction and rebirth into the form of gold, just as all substances sought upward movement on the Chain of Being. Thus, alchemists believed that the philosopher's stone could be obtained as the result of atomic changes in lead, leading to the transmutation into gold and the philosopher's stone. As discussed earlier for animal symbolism, a rich language surrounding the philosopher's stone and the alchemical experiment assimilated into literature and the general culture. This chapter will focus on

the philosopher's stone and the alchemical images that Milton uses in *Paradise Lost* to enhance his themes.

While there is evidence of a common theory behind alchemy, Muir's research of the encrypted notebooks of known alchemists finds that the methodology of the alchemical experiment was far from uniform; in fact, descriptions were generally confusing and inconsistent, partly due to alchemists' encoded notes, but also due to their tendency to merge spiritual, mystical, and even magical qualities with the natural or physical qualities that make up the "science" of alchemy. In particular, an exact description of the philosopher's stone is notably elusive, and Muir provides a historical citation that best captures its vague but alluring nature; he quotes a seventeenth-century alchemist writing under the *nom de plume* of Eirenaeus Philalethes, author of *A Brief Guide to the Celestial Ruby*:

The Philosopher's Stone is a certain heavenly, spiritual, penetrative, and fixed substance, which brings all metals to the perfection of gold or silver (according to the quality of the Medicine), and that by natural methods, which yet in their effects transcend Nature.... Know then that it is called a stone, not because it is like a stone, but only because, by virtue of its fixed nature, it resists the action of fire as successfully as any stone. In species it is gold, more pure than the purest; it is fixed and incombustible like a stone, but its appearance is that of very fine powder, impalpable to the touch, sweet to the taste, fragrant to the smell, in potency a most penetrative spirit, apparently dry and yet unctuous, and easily capable of tinging a plate of metal.... If we say that its nature is

spiritual, it would be no more than the truth; if we described it as corporeal, the expression would be equally correct. (37)

With this ambiguous picture in mind, it is easy to understand the difficulty alchemists faced when applying the ancient theories to physical experimentation. Despite the intentional obfuscation in historical texts, alchemists through the ages persevered in the daunting task of applying historical and anecdotal ideas to physically demanding, expensive, time-consuming, and dangerous experimentation.

In addition to the goal of achieving vast wealth, alchemists were motivated by the dream of discovering the elixir of life, a medicine that would cure all diseases and provide eternal youth, if not immortality. For example, in Chaucer's *General Prologue to the Canterbury Tales*, the avaricious Doctor of Physic prefers to dispense, above all medicines, a cordial of liquid gold (440-44), referred to as *aurum potable* by the alchemist Paracelsus, which could be used to cure any illness or disease. Just as gold flecks or particles can be mixed with water to achieve gold coloring, the elixir was thought to consist of the powder of the philosopher's stone mixed with water, which could be consumed by the fortunate owner.

Muir found that throughout history and throughout the Mideast and Central Europe, alchemists experimented with a wide variety of chemicals and ingredients, including acidic agents that were thought to accelerate the destruction of the base metals. But overall, the three principal substances of the experiment were mercury, sulfur, and salt, which were in turn sub-classified by their quality. For example, alchemists believed that mercury had to be matured, developed, and perfected to its highly toxic liquid state to be able to dissolve inferior metals and transmute them into

gold. In addition, sulfur, a versatile golden-yellow, non-metal chemical, was thought to be the inflammable part of all matter and could be used to turn liquid mercury into an inert, black solid. Sulfur has been associated in science and alchemy with fire, gunpowder, and volcanoes (where the substance was commonly found) and is sometimes thought to be the “father of metals” (Fowler 101), especially when combined with mercury. In literature, the image of sulfuric fire can also be viewed through the lens of Christian humanism to blend the biblical concept of Hell, with its ever-lasting fires for the damned, and the classical concept of Tartarus, the dungeon of everlasting punishment in the underworld. Alchemists also classified ingredients according to their measure of the four elements; that is, how much each one consisted of earth, air, fire, and water. For example, dry substances were thought to contain more earth, hot substances more fire, moist substances more water, and cold substances more air.

In addition to the amount of physical ingredients used in an experiment, alchemists also considered the degree of the theoretical Primal Element, also called the One Thing, soul of all things, or the Essence, which must be present in perfect proportion to make the transmutation possible. The final stage of transformation was named by Paracelsus as the “quintessence,” which he and other alchemists considered to be the fifth element, partly material and partly ethereal. Ancient philosophers and alchemists described the “subtle ether,” a fluid or fabric layer in space in which the common essence of all things exists. In this layer exists the perfect, unified combination of properties or characteristics that make up the purest essence of each particle, such as its hardness or softness, its solidity or liquidity. Thus, alchemists believed that it was during the descent of the particles from the ether to earth that their properties become

separated and deformed. The goal of alchemy, then, not creation, but restoration of the same pure, individual essence that the substance had once had in the ether by imposing the optimal order and combination of salt, mercury, and sulfur, thereby reuniting it to the unity it shares with the universe, called its quintessence.

The exact process of the alchemical experiment was as varied as the number of alchemists themselves, but some common terms and processes have been found. Procedures consisted of the general stages described by White in Chapter 1 of this study, including grinding, calcinating, dissolving, putrifying, and cooling into a solid. One stage that is most important for this chapter is that of sublimation, which was the process of heating a solid substance into a gas and collected as sediment; in this stage, the solid mixture of sulfur and mercury was distilled into a red liquid precipitant at the top of the vessel, separated from the impurities left in the remaining liquid. This purification was a critical stage in the transmutation. Muir includes another relevant citation by Philalethes using a metaphor of digestion for the process of transmutation and a comparison of the resulting artificially purified gold to the natural purity of mined gold:

The only thing that distinguishes one metal from another...is its degree of maturity, which is, of course, greatest in the most precious metals; the difference between gold and lead is not one of substance, but of *digestion*; in the baser metal the coction has not been such as to purge out its metallic impurities. If by any means this superfluous impure matter could be organically removed from the baser metals, they would become gold and silver. So miners tell us that lead has in many cases

developed into silver in the bowels of the earth, and we contend that the same effect is produced in a much shorter time by means of our Art. (21)

Amid the extensive and often conflicting compilation of historical texts and notebooks, alchemists typically merged figurative and literal language for the transformation; assigned moral and ethical qualities to metals; and assigned to themselves the honored role of guide to restore metals to their original state of purity through the process of transmutation.

In literature, alchemy usually symbolizes an internal, not physical transformation, and in his early writings, Milton incorporates alchemical images that refer to this figurative change. For example, in *Areopagitica*, published almost twenty-five years before *Paradise Lost*, Milton castigates the use of censorship, despite some people's rationalization that the end justifies the means, using the language of alchemy, with specific reference to the stage of sublimation:

But some will say, What though the inventors were bad, the thing for all that may be good? It may be so; yet... I am of those who believe, it will be a harder alchymy then Lullius ever knew, to sublimat any good use out of such an invention. (208)

In this passage, Milton references Raymond Lully, a fourteenth-century theologian and author well known for his books on alchemy. Milton uses the example of Lully's failure to find the secrets to the philosopher's stone as a measure of the difficulty, if not impossibility, of censorship to ever be "sublimated" (or purified) into something beneficial for society.

In *Paradise Lost*, Milton incorporates alchemical terms and images throughout the epic to suggest chemical or transformative change, sometimes with negative connotations, but more often with neutral, nonjudgmental connotations, showing a more tolerant or at least utilitarian attitude toward alchemy compared to his earlier skepticism. The negative images in *Paradise Lost* are found in passages about Satan and the fallen angels, possibly to evoke the sordidness of alchemy and the artificiality and hubris of their attempt to create a “kingdom” in hell. In general, however, the references to alchemy seem to be added simply for their metaphoric value. In Book 1, multiple references to sulfuric fires of Chaos contrast the recent relocation and debasement of the fallen angels with the eternal purity of the angels in Heaven, still living with “Gods and Heav’nly Essences” (138), a reference to the alchemical element of quintessence found in the heavens. As Satan observes a lake of liquid fire, he references the ancient volcanoes of Mount Aetna in which earth and rock were “sublim’d with Mineral fury” (235), meaning they were transmuted from a solid directly into a vapor (skipping the liquid stage) from volcanic heat, and then cooled back into a purified solid. The references to sulfuric fires in Book 1 (69, 171, 674) convey not only a Christian-humanist image of everlasting punishment, but also add the dark, alchemical imagery of an inverted transmutation of beings from their previous spiritual purity to choking, suffocating evil incarnate. In addition, the catalog of demons includes the false god Moloch and the sacrifice of humans who “past through fire to His grim Idol” (396-97), conveying an image of physical death as a test of faith.

In Book 2, the alchemical language continues with contrasts of the barren desert of hell to “the riches of heaven’s pavement, trodden gold” (682), associating gold with

the magnificence of heaven. In the first direct reference to alchemy, the trumpet of the Stygian Council “sounding Alchymie” (517) emphasizes that the brass trumpet has the appearance of gold, but also implies that the fallen angels’ assembly is a sham and a tawdry imitation of the unfallen angels assembled in divine orderliness in heaven. Later, in Book 12, Michael foretells that on Judgment Day, Satan and his perverted world will be “dissolved” (546) by God, while man and the faithful will “appeer of respiration” (540) and be revived through atonement, referencing both the beginning and ending stages of alchemical transmutation.

In Book 5, Milton uses alchemical language in metaphors for the transmutation of earthly matter to the purity and perfection of heavenly essence. For example, Eden’s flowers and fruit are “by gradual scale sublim’d / To vital Spirits aspire” (483-84), suggesting that because they so perfectly nourish man, the plants of Eden are gradually being transmuted into another, higher incarnation in the Chain of Being. Even more pointedly, Raphael describes how he transforms material food into the spiritual substance of thought, using the alchemical metaphor of transmutation:

The angel, nor in mist, the common gloss
Of Theologians, but with keen dispatch
Of real hunger, and concoctive heat
To transubstantiate; what redounds, transpires
Through spirits with ease; nor wonder; if by fire
Of sooty coal the Empiric Alchemist
Can turn, or holds it possible to turn

Metals of drossiest Ore to perfect Gold

As from the Mine. (435-43)

In this passage, Raphael's description of the angels' food reflects Plato's winged charioteer who assimilates his proper food in the heavens and turns it into ideal reason. Raphael implies that the food's transubstantiation into bodily and spiritual nourishment is as mysterious as alchemy, which can (possibly) turn base metal into gold as pure as that mined from the earth, reflecting Muir's quote earlier in this chapter from historic alchemical texts. Milton might be skeptical about alchemy, but he is informed and drawing on its imagery of material transformation.

Finally, Milton repeatedly uses images of gold with a moral context, including the sanctity of natural sunlight, natural gold in the earth, and divine gold heaven, sharply contrasted with the Mammon's perversion that opens a wound in the earth to create Pandemonium:

... by him first

Men also, and by his suggestion taught,

Ransack'd the Center, and with impious hands

Rifl'd the bowels of thir mother Earth

For Treasures better hid. (1: 684-88)

Where Satan's gold is concerned, Milton reflects the historical bias against mining dating back to Pliny for "the evil caused by gold and silver" (Svendsen 117). Milton might also be comparing the greedy intentions of the fallen angels to mine gold in hell with those of the alchemists who attempt to obtain unnatural gold through transmutation. In another example, Raphael tells Adam that on the first day, God

created light that is “quintessence pure” (7: 244), a term commonly used in literature for potable gold, the grand elixir, and the philosopher’s stone. In other examples, Adam and Eve thank God for the beauties of nature, and in their prayer, they remind the hills and lakes that the sun paints “your fleecie skirts with Gold (5: 186). They compare the color of the perfect fruits of Eden to “massie Gold” (5: 634), and Raphael compares earth to the beauty of heaven “whose dust is Gold” (7: 578).

Most significantly, when Satan, visiting the earth for the first time, is overcome by the brilliance of the sun, the location he finds is described using alchemical language, rich with nuance:

With radiant light, as glowing Iron with fire;
If mettall, part seemd Gold, part Silver cleer...
... and a stone besides
Imagind rather oft then elsewhere seen,
That stone, or like to that which here below
Philosophers in vain so long have sought,
In vain, though by their powerful art they bind
Volatile Hermes...
What wonder then if fields and regions here
Breathe forth *Elixir* pure, and Rivers run
Potable Gold, and when with one vertuous touch
Th ‘Arch-chimic Sun so farr from us remote
Produces with Terrestrial Humor mixt

Here in the dark so many precious things

Of colour glorious and effect so rare? (3: 594-613)

Here, the incomprehensible light and the regenerative powers of the sun are compared with potable gold, the elixir that could produce eternal life. Satan, cast out of heaven and denied natural light, experiences the radiance and life-generating power of the sun, which is compared to artificial gold produced by the philosopher's stone, perhaps the only source of light he, as alchemist, can hope to attain in hell. The specific metals (iron, silver, and gold) and the transmutation of "Volatile Hermes," or Mercury, are clear references to the process of the alchemical experiment. Similarly, the terms "stone," "Elixir," and "potable gold" all refer to the legendary goal of alchemy. The skepticism implied by Milton's use of "Imagind rather oft then elsewhere seen" and repetition of "in vain" suggest multiple meanings: the failure of alchemists to produce the elixir (despite legendary claims); Satan's failure to achieve a God-like status in heaven; the false pride of Satan and frustrated alchemists, whose vanity led to nothing but futility for trying to accomplish artificially what the sun, God's elixir, even at such a great distance, can create in such abundance in nature; and finally, veins of gold, long sought-after by miners for their precious metal. Further, the image of the "Arch-chimic Sun" demonstrates Satan's inability to understand the dazzling splendor by any other way than an artificial, man-made object. Again, the "sun" has multiple meanings that point to Milton's Christian humanism: it is an ancient image of the philosopher's stone, legendary but unachieved, whose mixed "humors" (elements), promise to produce something precious and rare; it is the life-producing sun of natural philosophy that mixes the four earthly humors; and it is the Christian image of the Son of God, whose

existence is so distant in heaven, but whose freely offered sacrifice will redeem man's original sin and offer eternal life in heaven.

The cumulative number of alchemical metaphors points to the significant influence of alchemy in *Paradise Lost* and demonstrates Milton's unequivocal understanding of the process and his intentional use of the alchemical metaphor for a variety of purposes, not just one of derision. He blends alchemical language and theory, both ancient and modern, with the insight and perception of an experienced alchemy scholar, if not a practitioner.

These four chapters have included the salient points of this study: historical roots of alchemy; the ancient concepts that marital union produces the birth of the soul and that destruction is necessary for this birth; the specific animal images used in *Paradise Lost* that reference alchemy; and the direct alchemical references in *Paradise Lost* that suggest Milton's understanding of alchemy and his intentional use of the alchemical metaphor. But the question still remains of why Milton chose this metaphor for a narrative so obviously rooted in theology. The conclusion will examine Milton's theology in historical perspective and arrive at a theory that suggests the purpose for the use of alchemical images in his masterwork.

CHAPTER 5. CONCLUSION: ALCHEMY AND MILTON'S THEOLOGY

In Milton's early prose, as previously noted, he writes of alchemists with contempt, playing to the public fear and distrust of alchemy. He uses the images as condemning metaphors for greed, such as in his rebuke of the Catholic bishops: "Their trade being, by the same Alchymy that the *Pope* uses, to extract heaps of *gold* and *silver* out of the drossie *Bullion* of the Peoples sinnes" (*Of Reformation* 100). In another example, he censures bishops through an inverted image of alchemy: They themselves are a "distill'd quintessence, a pure elixar of mischief, pestilent alike to all" (*Reason of Church Government*). Yet the images in *Paradise Lost*, written at the end of his life and far removed from the political arena, have a more a utilitarian purpose that reflects the historical roots of the legendary transmutation, as shown in the previous chapters in this study. With a characteristically broad-reaching and creative mind, Milton blends ancient alchemical images and language with Christian themes, including hell and heaven, Satan and the angels, God's creations, and most importantly, redemption. This study concludes with the suggestion that Milton uses alchemical images and their moral implications for an even grander purpose that relates to his theology.

Stanley Fish, a noted Milton scholar, states that, in Milton's view, man's idea that he is free of, or independent from, service to God is an illusion:

In Milton's world... there are no moral ambiguities, because there are no equally compelling values. There is only one value—the value of obedience—and not only is it a mistake to grant independence to values

other than the value of obedience, it is a temptation. Indeed, it is *the* temptation—the temptation to seek a separate, self-sustaining existence—that Milton obsessively explores. (53)

Although these words do not apply directly to alchemy, they imply that obedience is man's path to salvation and one of Milton's pervasive themes. This concept suggests that in *Paradise Lost*, Adam and Eve test their limits while they experience their environment, just as God intended when giving them free will. Likewise, as they try to test their independence, they experience temptation and fall. They regain their salvation only by recommitting themselves to obedience, not just by joining hands, but by forming a spiritual bond to fortify and thereby sanctify each other in God's service.

This study concludes that, among Milton's many themes, he interprets the Biblical story of the Fall in the framework of scientific experimentation. Equipped not only with a rational mind but the free will to wield it for good or evil, man represents God's grand experiment in the universe. With the rich background of the creation story, Milton himself seems to experiment with this impossibly complex and dynamic divine experiment. God as experimenter provides both ordained and forbidden knowledge to man, an unpredictable agent, who uses that knowledge in his own experiment on the earth to change not only his world, but God's experiment. The combination and interaction of these elements and outcomes confirms the value of testing and of knowledge. Just as Francis Bacon promotes experience as man's way of learning about the natural world, Milton promotes experiential learning as man's duty to learn about his place in God's world, just as Milton himself, reared a Puritan, believes in the experiential reading of the Bible as man's devotional duty. Thus, this study proposes

that Milton looks to science, even the ancient science of alchemy, for the language, imagery, and metaphor to assist man, both his fictional Adam as well as his fit readers, in discovering and appreciating God's magnificent world and in aiding their recovery from sin and failure.

Despite the fact that alchemy was banned by Milton's lifetime, Mendelsohn's study finds links between alchemy and the Puritan theology in the mid-seventeenth century, concluding: "The Restoration certainly had not separated chymistry from all its spiritual meanings or from its occult tradition" (63). Encouraged by Renaissance mystics such as Paracelsus, chemical laboratories like Newton's existed all over England, including universities, the house of the royal family, and church leaders who were spurred by a religious fervor for finding "a perfect Medicine of all imperfect Bodies, and to change them into the best Gold, and to cure all Diseases of Man" (39). In an era of political turmoil, disunity, and challenged religious beliefs, Puritans conceivably awaited a "chemical apocalypse" to complement the chemical creation (43).

Lewalski's biography of Milton states that "Milton's Arminianism lies at the heart of the theodicy which is the stated intent of *Paradise Lost*: To 'justifie the wayes of God to men'" (474). Milton rejected the strict Puritanical belief of predestination with salvation only for the elect and damnation for the reprobates; instead, he believed that although man's original sin left him impure and depraved, he could return to his purified state by willfully improving his inner spirituality and subjecting himself to tests of faith. With the aid of God's prevenient grace, people had to use right reason and "continually and freely choose to act from obedience and love" (474). Like base metals

languishing in the earth, Milton's postlapsarian humans in *Paradise Lost* are defaced and defloured. Adam and Eve's sin did not result in a physical death, as they feared, but a living death, like the deathless life of chemicals undergoing a series of life-altering transformations. The all-seeing, merciful God foretells what will happen to fallen, shattered man:

My Hell-hounds, to lick up the draff and filth
Which mans polluting Sin with taint hath shed
On what was pure, till cramm'd and gorg'd, nigh burst
With suckt and glutted offal, at one sling
Of thy victorious Arm, well-pleasing Son,
Both *Sin*, and *Death*, and yawning *Grave* at last
Through *Chaos* hurld, obstruct the mouth of Hell
For ever, and seal up his ravenous Jawes.
Then Heav'n and Earth renewd shall be made pur
To sanctitie that shall receive no stain. (10: 630-9)

Images in this passage show God as a metaphorical alchemist: a divine scientist present in His experiment, pouring raw, impure (human) ingredients into (earthly) vessels for a designed experiment; adding caustic materials of Sin and Death to dissolve man's polluted soul; observing it moving through stages of putrifaction, sublimation, and fermentation; distilling it gently by the mediating effect of the Son's sacrifice; and finally completing the experiment with the defeat of the caustic elements and the transformation of man back to a state of stainless purity on Judgment Day. While the

passage does not use explicit language of alchemy, there is an undeniable parallelism of themes.

In an alchemical allegory, Adam and Eve are the living ingredients in a divine experiment, and their journey toward redemption will be tested by extreme acts; the serpent and his temptations symbolize the experiment's catalyst and the fire that burns under the vessels to begin the destructive stage, with Sin and Death as caustic agents that break down mankind's elements. As Michael foretells, man will face a future of pestilence, death, and destruction as though they are being poured from one vessel to another, assaulted by heat and acid, disassembled into basic elements, and rearranged into a new and purified form. Like the legendary *ouroboros*, the endless cycle continues until the final judgment, when God forgives and restores man to better than his original state. Unlike the fabled goal of alchemy, however, man's salvation is assured; on Judgment Day, the Son, the Royal Child, will appear and invite them to partake of the "divine elixir" in heaven.

The question of whether or not Milton actually practiced alchemy remains a matter of speculation, without any evidence found in biographies or writings. While alchemy and other forms of magic still captured the imagination of the seventeenth century, it is possible that Milton, informed of both the ancient and current state of science, had already grown skeptical. Yet, even if that were true, he increasingly uses the alchemical metaphor objectively; he neither promotes nor mocks it. Instead, he uses the familiar, ancient metaphor to capture the interest of "fit readers" and stir them with provocative images that convey his message. In an era of intense religious and political persecution, an aging Milton was mindful of the challenges and tests that faced all

believers. One explanation for the pervasive language and symbolism of alchemy in *Paradise Lost* is that Milton uses it as a lesson for believers; they must trust that God, the Divine Alchemist, has a plan, will impose and then moderate the extent of disorder and tests of virtue, and will provide the controlling effects of grace and forgiveness so that fallen man can restore his pure nature and receive the elixir of heaven. It is the conclusion of this study that Milton, steeped in both ancient science and Bacon's emerging scientific method with its emphasis on reasoning and experimentation, was attracted to the metaphor of alchemy because it symbolized a systematic method to restore the orderliness of virtue and right reason. Milton would have found comfort in this ancient metaphor because its humble beginning arrives at a triumphant end. Alchemy represents Milton's theology in alchemical images and delivers, like *Paradise Lost* itself, a message of hope.

WORKS CONSULTED

- Alighieri, Dante. *The Divine Comedy, Volume 1: Inferno*. Trans. Mark Musa. Indiana: University Press, 1984. Print.
- Bacon, Francis. *The New Organon*. Ed. Lisa Jardine and Michael Silverthorne. Cambridge, UK Cambridge University Press, 2000. Print.
- Blyth, Dougal. "The Ever-Moving Soul in Plato's *Phaedrus*." *The American Journal of Philology* 118.2 (1997): 185-217. Print.
- Chaucer, Geoffrey. *General Prologue to the Canterbury Tales. The Riverside Chaucer*. Ed. Larry D. Benson. Boston: Houghton Mifflin, 1987. Print.
- Christianson, Gale E. *Isaac Newton*. New York: Oxford University Press, 2005. Print.
- Coudert, Allison. *Alchemy: The Philosopher's Stone*. Boulder, CO: Shambhala Press, 1980. Print.
- Edwards, Karen L. *Milton and the Natural World: Science and Poetry in Paradise Lost*. Cambridge, U.K.: Cambridge UP, 1999. Print.
- Fish, Stanley. *How Milton Works*. Cambridge, MA: Belknap Press, 2001. Print.
- Flannagan, Roy, ed. *The Riverside Milton*. By John Milton. Boston: Houghton Mifflin, 1998. Print.
- Foote, Paul D. "The Alchemist." *The Scientific Monthly* 19.3 (1924): 239-62. Print.
- Fowler, Alastair, ed. *Paradise Lost*. By John Milton. NY: Longman, 1998. Print.
- Gair, W. Beverly. "Milton and Science." *John Milton: Introductions*. Ed. John Broadbent. London: Cambridge University Press, 1973. Print.

- Hutchinson, F. E. *Milton and the English Mind*. New York: Haskell House, 1974. Print.
- Knoppers, Laura L., and Gregory M. Colon Semenza. *Milton in Popular Culture*. New York: Palgrave Macmillan, 2006. Print.
- Levin, John. *Alchemy and Economy in Seventeenth Century England*. UK: England & Wales License, 2010. *Anterotesis*. Web. 13 March 2012.
- Lewalski, Barbara Kiefer. *The Life of John Milton: A Critical Biography*. Oxford, UK: Blackwell Publishers, 2003. Print.
- Lovejoy, Arthur O. *The Great Chain of Being: A Study of the History of an Idea*. Cambridge, MA: Harvard University Press, 1961. Print.
- MacFarlane, Ross. "Royal Society Miscellaneous Manuscripts." *Notes and Records of the Royal Society of London* 59.3 (2005): 309-12. Print.
- Marilla, E. L. *Milton and Modern Man*. Tuscaloosa, AL: University of Alabama Press, 1968. Print.
- Mendelsohn, J. Andrew. "Alchemy and Politics in England 1649-1665." *Past & Present* 135 (May, 1992): 30-78.
- Milton, John. *Areopagitica. John Milton: Selected Prose*. Ed. C.A. Patrides. Columbia: University of Missouri Press, 1985. Print.
- . *The Complete Poetry of John Milton*. Ed. John T. Shawcross. New York: Doubleday, 1971. Print.
- . *The Doctrine and Discipline of Divorce. John Milton: Selected Prose*. Ed. C.A. Patrides. Columbia: University of Missouri Press, 1985. Print.
- . *The Reason of Church Government. The Second Book: The Conclusion*. Ed. T. H. Luxon. *The Milton Reading Room*. Web. 12 June 2012.

- . *Of Reformation in England. John Milton: Selected Prose*. Ed. C.A. Patrides. Columbia: University of Missouri Press, 1985. Print.
- Muir, M. M. Pattison. *The Story of Alchemy and the Beginnings of Chemistry*. London: Cambridge University, 2004. *Project Gutenberg*. Web. 12 June 2012.
- Muldrow, George M. *Milton and the Drama of the Soul*. Paris: Mouton, 1970. Print.
- Patrides, C.A. *Milton and the Christian Tradition*. Oxford: Clarendon Press, 1066. Print.
- Plato. *Phaedrus and Letters VII and VIII*. Trans. Walter Hamilton. London: Penguin Books, 1973. Print.
- . *Symposium*. Trans. Robin Waterfield. Oxford: Oxford University Press, 1994. Print.
- Plotinus. "From the *Fifth Ennead*." *The Norton Anthology of Theory and Criticism*. Eds. Vincent Leitch et al. New York: Norton, 2001. Print.
- Ragai, Jeane. "The Philosopher's Stone: Alchemy and Chemistry." *ALIF: Journal of Comparative Poetics* 12 (1992): 58-77.
- Rescher, Nicholas. G. W. *Leibniz' "Monadology": An Edition for Students*. Pittsburgh: University of Pittsburgh Press, 1991. Print.
- Rosencreutz, Christian, and E. Foxcraft. *The Chemical Wedding of Christian Rosenkreutz Anno 1459*. Kila, MT: Kessenger Pub, 1690. Print.
- Svendsen, Kester. *Milton and Science*. Cambridge, MA: Harvard University Press, 1956. Print.
- Tomlins, Thomas Edlyne, ed. *The Statutes at Large, of England and of Great Britain: From Magna Carta to the Union of the Kingdoms of Great Britain and Ireland*. Vol. 2 (1377-1504). London: George Eyre and Andrew Strahan, 1811. Print.

Walsh, James J. *Old-Time Makers of Medicine: The Story of the Students and Teachers of the Sciences Related to Medicine during the Middle Ages*. NY: Fordham

University Press, 1911. *Project Gutenberg*. Web. 12 June 2012.

White, Michael. *Isaac Newton: The Last Sorcerer*. Reading, MA: Addison-Wesley, 1997. Print.

Yeats, W. B. *Rosa Alchemica*. 1913. *Project Gutenberg*. Web. 12 June 2012.