Magic, Medicine, and Natural Philosophy:
Alchemical Manuscripts as Evidence of Medieval Interdisciplinary Practice

In today's public discourse, alchemy has unfortunately inherited the fairy-tale framing imparted by eighteenth century historians and has been strongly associated with fraudulent practices, greed, and superstition. Alchemy is one of those subjects that has constantly wavered between myth and reality due in part to the discrepancies between modern and medieval categorizations of magic, science, and theology. The ultimate goal of the average medieval alchemist was to produce the "philosopher's stone," a substance they believed could transmute lead or other base metals into silver and gold, and could ensure long life and good health to the user.[1] Due to the fantastic nature of this claim, alchemy constantly fell in and out of favor among medieval scholars, theologians, religious orders and the general public during the Middle Ages; even modern historians vary between debunking and defending it.[2] However, the alchemists' did produce practical technologies and applicable theories that went on to inform later chemical, mineral, and technological research, and re-define our understanding of our own power to affect change to nature. But within a university system that firmly divided theology and philosophy from mechanical arts and science, alchemy did not immediately find a home; medieval scholars could not find a place for a practice that was both chemical and theological. Despite its itinerant nature, alchemy thrived in quasi-secrecy between the silos of the traditional

[1] Richard Kieckhefer, *Magic in the Middle Ages* (Cambridge: Cambridge University Press, 1989), 134.
[2] According to historian Thomas Newman, alchemy in the Latin West developed in three stages: translation, increasing scholasticism, and dissociation from the university context into religious and figurative expression. For more, see William R. Newman, "Medieval Alchemy," in *The Cambridge History of Science, 2: Medieval Science*. Ed. Lindberg, David C. & Shank, Michael H. (Cambridge: Cambridge University Press, 2013), 385–403.

liberal arts. The recipes, rich illustrations, and theoretical arguments found in surviving alchemical manuscripts provide physical evidence of alchemy's ability to bridge the gap between religion, science, medicine and philosophy and form a truly interdisciplinary subject.

The term "alchemy" itself is a translation of the Arabic word *al-kīmiyā*—the first indication that the practice had a long history in the Arabic and Greek cultures before it ever made it into the Latin West.[3] Because of often indecipherable manuscripts and the heavy cost of setting up a lab, hiring assistants, obtaining raw materials, etc., alchemy was among the last of the "magical" arts to arrive in Europe.[4] The first Arabic alchemical text ever translated into Latin, Morienus' "On the Composition of Alchemy," was completed in 1144 by an English monk then living in Spain called Robert of Chester. This first translation introduced many terms that we would now recognize in modern chemistry: alkali, naphtha, alcohol, and elixir.[5] Robert's work occurred during a period of mass translation of Arabic scientific texts into Latin. Astrology, talismanic magic, mathematics, philosophy, optics, and physics are some of the other Arabic disciplines discovered by the West in this period.[6] But, by the early thirteenth century, only a few more alchemical texts had been translated from Arabic into Latin—a tiny amount in comparison to related disciplines such as astrology.[7] This slow growth highlights the extensive background knowledge and large sum of startup money that was required to successfully practice alchemy. Despite the gradual introduction of new texts into the Latin West, compared to other branches of

[3] Newman, "Medieval Alchemy," 385.
[4] Anne Lawrence-Mathers and Carolina Escobar-Vargas, *Magic and Medieval Society*, Seminar Studies (London; New York: Routledge, 2014), 40; here, "magical" is defined as occult, hidden, but ultimately grounded in an attempt to understand the world;
[5] As Kieckhefer states in *Magic in the Middle Ages* (133-35), in addition to vocabulary, alchemy also imparted several methodologies that are now in common use within chemistry and other sciences such as calcination and distillation.
[6] Benedek Láng, *Unlocked Books* (University Park, PA: The Pennsylvania State University Press, 1974), 2.
[7] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society*, 40.

philosophy, alchemical works were translated more quickly into vernacular languages.[8] This early vernacularization contributed to the localization and fragmentation of alchemical practices, techniques, and theories.[9]

Because alchemical manuscripts dealt in secrets, codes, and processes not easily understood by non-specialists, they were often considered to be magical. During the Middle Ages in Europe, most people tended to think of magic as "natural"—something that occurred in nature without inherently evil or demonic connotations. However, during the first few centuries of the medieval period, theologians and philosophers made a clear distinction between the two types of magic they observed: natural and demonic. Demonic magic was considered to be a perversion of religion, such as conversing with demons or asking for demonic intervention in human affairs. As explained by Lawrence Principe and Laura Light in their primer *Alchemy*, "up through the twelfth century, if you asked a theologian what magic was, you were likely to hear that demons began it and were always involved in it."[10] There was a constant mistrust of written records of occult practices—including of seemingly harmless texts like herbals or recipe collections—and a fear among the learned elite that an unsuspecting victim may be misled into conspiring with demons if they utilized any dubious recipes or instructions found within these works.

[8] Lawrence M. Principe and Laura Light, *Alchemy*, ed. Sarah Hindman, vol. 2, Primer (New York: Les Enluminures Ltd., 2013), 6.

[9] The *Semita recta*, a thirteenth-century alchemical bestseller by pseudo-Albertus Magnus is a good example of the wave of vernacularization of scientific texts in late medieval England. The specific focus of the manuscript on pharmacology and alchemy could indicate a push for vernacularization based in the need for medicinal cures in England. In fact, many of the alchemical English manuscripts have more practical than philosophical orientations. For more about the vernacularization of alchemical manuscripts, see Peter Grund, "'ffor to Make Azure as Albert Biddes': Medieval English Alchemical Writings in the Pseudo-Albertan Tradition," *AMBIX* 53, no. 1 (March 2006): 21–42, esp. 23-41.

[10] Kieckhefer, *Magic in the Middle Ages*, 10.

However, the further integration of Arabic knowledge into European scholarly discourse in the later Middle Ages allowed for the grudging recognition that some forms of magic were not propelled by demons. Natural magic or natural philosophy—the study of phenomena or processes that already happened within nature that humans may or may not understand—was not feared or mistrusted, but was, in fact, included in institutionalized medieval academic study. As explained by historian Richard Kieckhefer, "natural magic was not distinct from science, but rather a branch of science. It was the science that dealt with 'occult virtues' (or hidden powers) within nature."[11] Those who studied natural magic strived to describe and explain in their work how to harness these processes for human benefit.[12] Because it was a "learned" subject from the Islamic world, its origination points in Europe aligned with centers of translation like Byzantium, Sicily and Spain. "Learned magic texts circulated in manuscripts, described complex rituals, and often drew on the same cosmological concepts as more scientific works translated in the same period."[13] The discovery that some magical ideas actually had medicinal and scientific applications, and that many of the concepts therein coincided with or were adapted to Christian rituals, caused an increase in the number of magical works that were considered licit under the umbrella of "natural magic." Alchemists were very careful to position their experiments within the expanding new scientific discipline of natural magic in an attempt to legitimize their work and cement its place within scholarly circles.

[11] Kieckhefer, *Magic in the Middle Ages*, 9; "Occult" knowledge (processes and events that occurred without obvious explanation to medieval senses and understanding) existed alongside "manifest" knowledge (occurrences that could be explained by common knowledge, like gravity). An extremely sophisticated medieval work on the magnet by Petrus Peregrinus de Maricourt is one example of a force considered occult by the common people, but manifest by those "in-the-know."

[12] Page, *Magic in the Cloister,* 33.

[13] Sophie Page, *Magic in the Cloister: Pious Motives, Illicit Interests, and Occult Approaches to the Medieval Universe*, Magic in History (University Park, Pennsylvania: The Pennsylvania State University Press, 2013), 2.

Despite their lack of academic categorization, alchemical manuscripts themselves are prime examples of professional tools—books that instruct and assist the reader with their work or trade. Alchemical reference works were in demand by those who had the means to make experimentation their full-time job. For students or apprentices, these manuscripts were the instructional and theoretical texts they needed in order to learn. Officially, however, alchemy was not considered one of the liberal arts. It was thought that alchemists, through their experiments with transmutation, were too close to imitating God, and that teaching students how to create gold artificially would be, at best dishonest, and at worst a form of counterfeiting. Therefore, it was completely excluded from university curriculums.[14] In response, alchemists and other early modern scientists chose to pursue inquiry in more private spaces such as home labs or workshops, and passed on their work through an apprentice system rather than practice in public spaces like classrooms, laboratories, or anatomy theatres.[15]

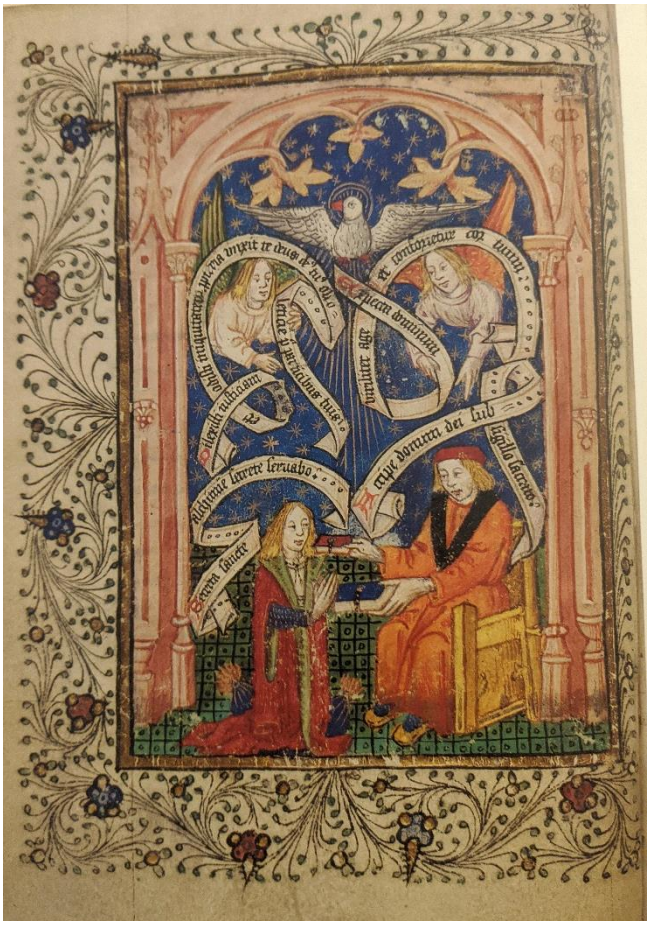

Figure 1. A person thought to be Thomas Norton, a well-known English alchemist, receiving a book from his master. British Library, Additional MS 10, 302, f. 6v.

[14] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society*, 41; Principe and Light, *Alchemy*, 4.
[15] Gareth Roberts, *The Mirror of Alchemy: Alchemical Ideas and Images in Manuscripts and Books: From Antiquity to the Seventeenth Century* (Toronto: University of Toronto Press, 1994), 18.

This private practice, coincidentally, also enabled more women to participate.[16] For women, whose professional lives were often housed within the home or in court, engaging in science or medicinal alchemy in order to care for their families or to advance their intellectual value was vital to their survival.[17] Without entering the apprenticeship system, reading alchemical texts was the easiest way for women to engage with the subject and find useful, practical information. By connecting with surviving alchemical manuscripts as examples of medieval instruction and learning, historians are able to explore the apprenticeships and informal learning that occurred outside of university settings. Functionally, because of the codes used in alchemical manuscripts, direct instruction from a practicing alchemist was often the only way to successfully and safely follow any of the instructions therein.[18]

Secrecy was of the utmost importance to alchemists. As explained by Gareth Roberts in his work *The Mirror of Alchemy*, "there is a strong tradition in western thought that important truths are most properly expressed in a veiled, obscure, or difficult way."[19] Alchemists themselves were aware of the highly linguistically coded texts written by the ancient authorities of their discipline. The "Emerald Tablet," rumored to have been written in antiquity by Hermes Trismegistus and translated into Latin from Arabic around 1200 CE, is one of those early texts composed in complex verse and often quoted and commented on by alchemists trying to rediscover its true meaning. The first four lines are as follows:

True it is, without falsehood, certain and most try.

[16] Meredith K. Ray, *Daughters of Alchemy: Women and Scientific Culture in Early Modern Italy*, Studies in Italian Renaissance History (Cambridge, Massachusetts: Harvard University Press, 2015), 3.

[17] Ray, *Daughters of Alchemy*, 3; of course, there is a large class divide between women at home and women at court. Poorer women tended to access their alchemical texts through miscellanies and later, 'books of secrets' that compiled herbal, medicinal and chemical knowledge alongside religious contemplation. Women at court would have had access to more alchemical writings and may have even conducted experiments or witnessed them in private laboratories.

[18] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society*, 41.

[19] Roberts, *The Mirror of Alchemy*, 68.

> *That which is above is like to that which is below, and that which is below is like to that which is above, to accomplish the miracle of one thing.*
> *And as all things were by the contemplation of one, so all things arose from this one thing by a single act of adaptation.*
> *The father thereof is the Sun, the Mother the moon...*[20]

This excerpt appears at first glance to be an indecipherable riddle, but in actuality, it references classic alchemical processes like the creation of the philosopher's stone and transmutation. The use of codes, allegorical language, and illustrated symbolism only became more complex with the advent of printing. Eventually, printers replaced the names of elements, metals, and chemicals with proprietary symbols or runes. Often this was an attempt to maintain an aura of mystery around the discipline and to keep their secrets out of the hands of "bunglers" who could give natural magic a bad reputation due to their failure.[21] But as the practice of alchemy in Europe progressed, a social motive appeared: the fear that an influx of gold would create laziness and foster misuse among those not ready to be in possession of it.[22] Alchemical manuscripts did not only contain practical instructions, but also heavily relied upon theoretical explanation and justification of their art. This, of course, caused a large problem both for later adopters of alchemical study, and for historians attempting to categorize alchemy within modern divisions of knowledge.

[20] Translated by R Steele and D W Singer.

[21] Kieckhefer, *Magic in the Middle Ages*, 141; Elias Ashmole (1617-1692), well known for his large manuscript collection at the University of Oxford, was a fervent admirer of medieval alchemists. He studied and reprinted many alchemical works and, according to historian Bruce Janacek, "delight[ed] in exposing these mysterious alchemical manuscripts for public consumption knowing all the while their secrets would remain intact from all but the worthy and knowledgeable adepts." For more, see Bruce Janacek, "A Virtuoso's History: Antiquarianism and the Transmission of Knowledge in the Alchemical Studies of Elias Ashmole," *Journal of the History of Ideas* 69, no. 3 (2008): 395–417, esp. 406.

[22] As is often the case in areas of study that require a large amount of background knowledge, the people "in the know" effectively act as gatekeepers. To them, outsiders, especially those they consider to be beneath them, are never "worthy" enough to share in their secrets.

Based solely on the written record, alchemy appears to have been both a forerunner to the exacting field of chemistry, and a highly complex and theologically informed magic that, as we will explore later, had almost no accurately identified authors or experts. Although alchemy was closely associated with university-approved disciplines, "such as medicine, astronomy, and astrology," the combination of experimentation and philosophy meant that alchemy was functionally a mix of both art and science with a third allegiance to manual and mechanical arts.[23] Those that branded it a mechanical art believed that it was better suited to the "realm of technology," to be used in military work, and to the theoretical work being done in the universities.[24] However, a strong connection between alchemy and science was also forming during this period. According to historian Meredith Ray, "'[medieval] science' is a term used imprecisely, to indicate what were in reality numerous strands of inquiry: philosophy, medicine, mathematics, alchemy, grammar, theology, even poetry."[25] Of those subjects, only philosophy, mathematics (arithmetic), and grammar were part of the medieval university curriculum.[26]

The tenuous position of alchemy between the arts and the sciences is mirrored by the position of medicine at this time. As described by historian William Newman, "like medicine, alchemy consisted of a body of theory about certain aspects of the natural world; this theory was then used to support a plethora of manual practices."[27] Medieval sources continuously discuss alchemy as "useful for health as well as wealth." In one memorable example, twelve men petitioned Henry VI for permission to practice alchemy in 1456 (three of them were royal

[23] Zachary A. Matus, *Franciscans and the Elixir of Life: Religion and Science in the Later Middle Ages*, 1st ed, The Middle Ages Series (Philadelphia: University of Pennsylvania Press, 2017), 2.
[24] Benedek Láng, *Unlocked Books* (University Park, PA: The Pennsylvania State University Press, 1974), 149.
[25] Ray, *Daughters of Alchemy*, 4.
[26] Philosophy, an Aristotelian subject, was a later addition to the traditional trivium and quadrivium curricular organizations of the early medieval period.
[27] Newman, *Medieval Alchemy*, 426.

physicians). In his response, the king cited the usefulness of the elixir produced by the philosopher's stone in curing illness, prolonging human life and providing an antidote to all poisons.[28] Clearly, rumors of the supposed medical applications of alchemy had reached the highest seat of power in medieval England. However, Islamic alchemy did not have the end goal of medicinal use—even though they would not have minded inadvertently making various compound drugs to assist with some of their more common ailments. The field of medicinal alchemy was a western invention created when the original Arabic works were translated.[29]

Some European alchemists viewed transmutation and metallurgy as supplements to medicinal practice; extracting impurities from base metals to allow for spontaneous, natural transmutation acted as a parallel to extracting bad humors from a person to allow for the replacement of said humor with the correct balance of good humors.[30] Alternately, Roger Bacon, a Franciscan friar with a keen interest in alchemy, argued that there were two roles for alchemy in medicine: to purify pre-existing pharmaceuticals he viewed as having been tainted by greedy apothecaries, and to prolong human life "by means of substances that have been 'reduced to equality with the aid of alchemy.'"[31] Bacon was interested in producing a substance with perfectly equal elemental qualities that was "incorruptible" and that could be applied either to sick people or to impure metals.[32] As described by historian Zachary Matus, "just as metallurgical alchemists transmuted and ennobled a base metal into gold by removing its negative properties and instilling positive ones, so too did alchemists hope to purify, transmute

[28] Kieckhefer, *Magic in the Middle Ages*, 138.
[29] Matus, *Franciscans and the Elixir of Life*, 3.
[30] Newman, *Medieval Alchemy*, 392.
[31] Newman, *Medieval Alchemy*, 393.
[32] Newman, *Medieval Alchemy*, 392; Some alchemists believed that medicinal alchemy was capable of curing more than just the body. In *De confectione veri lapidis* ("On the Making of the True Philosopher's Stone") by Johannes Rupescissa (c. 1310-c. 1362), the author posits that alchemy could "cure the ills of Christian society, and in particular, to aid the Church in the coming battle with the Antichrist." Principe and Light, *Alchemy*, 10.

and ennoble the human body."[33] Bacon believed that because both alchemy and medical humorism depended on achieving perfectly balanced elements, "an ignorance of theoretical alchemy necessarily entails ignorance of theoretical medicine, and thus failure in practical medicine."[34] Because of these deep connections between practical and medicinal alchemy, practical alchemy often appeared within miscellanies or other scientific codices surrounded by medical information.[35]

This inclusion in scientific texts was just one of the ways alchemical recipes and information appeared in writing in the Middle Ages. Often, handbooks on natural and "image magic" portrayed themselves as scientific works including astronomy, natural philosophy and medical texts.[36] Each manuscript that included alchemical information was a portrait of the scribe—how they classified the sciences, where they placed natural magic and philosophy within their intellectual framework, and what practical uses they identified within alchemical processes.[37] Even though alchemy was never incorporated into the university curriculum, it was often included in codices belonging to intellectual elites like clerics, students, and professors.[38] Miscellanies including natural magic also commonly included practical texts for non-specialists on surgery, tree grafting, and more. As noted by historian Sophie Page, "the close association of natural magic with medicine is reflected in the presence of [miscellanies] in the medical section of the library, along with three other genres with a marginal or dubious utility for monks: surgery (considered inappropriate to the monastic vocation and regularly prohibited), gynecology and

[33] Matus, *Franciscans and the Elixir of Life*, 4.
[34] Newman, *Medieval Alchemy*, 393.
[35] Láng, *Unlocked Books*, 149.
[36] Image magic has its roots in astrology. Practitioners would create talismans or "images" under appropriate astrological signs in order to harness the occult powers of nature. Image magic is similar to natural magic in that is not associated with demonic intervention.
[37] Láng, *Unlocked Books*, 49.
[38] Láng, *Unlocked Books*, 147.

veterinary medicine."[39] Alluding to the secret knowledge handled by the original practitioners, the term "secret" was given to medieval recipes that mixed practical use with occult or hidden wonder.[40] In the later Middle Ages, household recipe books that included alchemical techniques and philosophical alchemical texts were called "books of secrets," drawing from this phrase.[41]

Like any other manuscript that has been copied and recopied, changes and modifications to alchemical texts were made from one generation of text to another. Recipes in particular were prone to alteration as people tested them out and wrote their own versions to align with particular knowledge or expertise.[42] Very few vernacular alchemical texts are literal translations from the original Latin as generations of alchemists experimented with, improved, or deleted recipes as they sought to improve the discipline. In the medieval world, copies of texts repeated across multiple manuscripts bolstered their authority, especially when attributed to an author (pseudonym or not) that was well regarded. This practice reinforces the fact that these books should be considered professional tools as they served as authoritative texts, training manuals, and practical manuals for those who worked with alchemical concepts. But reader beware, copies that had been edited by less adept alchemists could be dangerous given the toxic or explosive nature of some of the chemicals used. This is one of the reasons that alchemical manuscripts were often kept within families or passed between master and apprentice—so skill level and knowledge could be trusted and gradually built upon.

Alongside recipes and instructions, alchemical texts often included discussions of the history and noble lineage of alchemy. In an effort to give legitimacy and authority to their practice, many scribes falsely attributed their own works to notable historical scholars and

[39] Page, *Magic in the Cloister, 34.*
[40] Page, *Magic in the Cloister, 35.*
[41] Principe and Light, *Alchemy,* 3.
[42] Grund, "'ffor to make Azure as Albert biddes'," 29-30.

theologians thereby creating a large number of "pseudepigrapha."[43] Alchemists believed that their practice was as old as the universe itself and that Adam, of Biblical fame, possessed the philosopher's stone (which was the reason for his long life).[44] They also believed that through their work, they sought to recover knowledge that had been lost sometime after antiquity. This caused a desire to firmly establish the authority and tradition of their art and resulted in many medieval texts being falsely attributed to historically powerful characters.[45] According to historians Anne Lawrence-Mathers and Carolina Escobar-Vargas, "this helped increase interest in the treatises in their own time—but it has had the effect of making it almost impossible to be definite on the authorship of many alchemical works, and had added to the complexity of an already difficult subject."[46] Not only did alchemists say that they were searching for lost secrets, they also claimed that they were rediscovering the mysteries of the Creation itself by altering the species of metals.[47] This, of course, caused a very mixed public reaction and contributed to the practice of falsely attributing alchemical works to avoid controversy. Another reason writers of alchemical texts may have wanted to conceal their identities is because many of them were, in fact, clergymen and monks.[48]

Because of the background knowledge required to study and practice alchemy (astrology, natural philosophy, and theology), theologians and other learned elites were best suited to take up the art. Deciphering alchemical manuscripts required that the reader have a good

[43] Pseudepigrapha are, briefly defined, works of dubious authorship.
[44] Roberts, *The Mirror of Alchemy*, 13.
[45] Roberts, *The Mirror of Alchemy*, 18.
[46] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society*, 40.
[47] Newman, *Medieval Alchemy*, 443; Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society*, 40.
[48] As detailed by Láng in *Unlocked* Books (151), a large number of alchemical texts were attributed to the Archbishop of Prague, Conrad of Vechta, under the reign of Emperor Sigmund, including a few that actually seem to have been scribed by Vechta himself. --- Lending further evidence to the idea that many clergymen were involved in alchemical experimentation, archaeological evidence was uncovered in Oberstockstall, Austria of an alchemical lab in a chapel's fireproof chamber that had functioned for 60 years under the direction of the parish priests.

understanding of "the nature of matter, and, by extension, the nature of the Creation," in order to unlock the secrets of the discipline.[49] In the thirteenth century, university theologians and scholars attempted to "integrate the exciting, but potentially dangerous non-Christian learning" both from Aristotle and from Arabic communities into a renewed and "deeper study of God's creation of the universe based on the accounts in the Bible."[50] This led them to study these "dangerous" texts, therefore legitimizing them and effectively stopping state and church authorities from creating a firm barrier between "acceptable" and "unacceptable" knowledge. As Newman explores in his article "Alchemy in the Middle Ages," the explanations of alchemy that natural philosophy can provide only go so far. The true draw of alchemy is its claim as a "'gift of God (donum Dei) that only the 'sons of doctrine,' an elite few, can successfully attain."[51] This, of course, would be very attractive for those wanting to become closer to God; monks in both the Franciscan and Dominican orders were fascinated with alchemy despite their mandate to devote themselves to more "worldly matters" like charity, common prayer, and service.[52] However, since both orders had specifically outlawed practicing alchemy several times, the consequences of such involvement were particularly dire.[53] With the increasing scrutiny of alchemical practice, it was important that publicly-known alchemists within theological circles distanced themselves from other alchemists by drawing short of claiming their work could fully transmute matter itself; they were careful to explain that they could only produce new "material appearances."[54]

[49] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society,* 40.
[50] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society,* 43.
[51] Newman, *Medieval Alchemy, 398.*
[52] Láng, *Unlocked Books*, 150-52.
[53] Condemnations issued by the orders included the Franciscans in 1260, the Dominicans in 1273, the Cistercians in 1317 and the Curia throughout the pontificate of Pope John XXII (1316-34). These sanctions included punishments almost to the level of imprisonment and excommunication and indicated a growing problem of alchemical practice within the orders. For more information see Láng, *Unlocked Books*, 150-52.
[54] Lawrence-Mathers and Escobar-Vargas, *Magic and Medieval Society,* 40.

This was an important distinction because changing matter itself was considered a miracle reserved only for God.

Religious authorities often applied religious texts to alchemy in order to justify their prohibitions. For example, the Canon Episcopi, question 26, 1, was used to directly address the claims of some alchemists that they could truly change base metals into gold thereby altering its species: "whoever believes that anything created [creaturan] can be either mutated or transferred into another species of into another similitude, except by the creator Himself, is an infidel, and worse than a pagan."[55] Transmutation aside, clergy members were justly fascinated by alchemical symbolism because it offered an array of Christian reinterpretations. Alchemy's focus on the corporeal, material world went well with Christian themes of materiality. Baptism, the eucharist, relics, etc. are all focused on finding and experiencing the materialism of creation, incarnation, and resurrection—a process that the religious orders would have seen mirrored in the practices of alchemy. Therefore, in many ways, alchemy was not antithetical to their theological practice or belief, but in fact supported it.[56] Historian Bruce Janacek also adds that "some alchemists attributed vast, even cosmological significance to their work, believing that they were purging the natural world of its impurities, redeeming a natural world that had fallen as surely as Adam and Eve had fallen."[57] Because of this association, the philosopher's stone was often connected to themes of redemption and restitution. Once alchemical manuscripts began to be highly illuminated in the fifteenth and sixteenth centuries, these themes became even more evident due to the use of religious and astronomical symbolism.

[55] Newman, *Medieval Alchemy*, 55.
[56] Matus, *Franciscans and the Elixir of Life*, 8.
[57] Janacek, *A Virtuoso's History*, 398.

Alchemical manuscripts are famous for their use of complicated, rich illustrations and deeply coded messages. One of the most common images associated with alchemy is the "alchemical wedding," or the marriage between the two most precious metals: mercury, often represented by the moon, and sulfur, often represented by the sun. This type of symbolism, of metals being depicted as planets, is called "terrestrial astronomy."[58] In antiquity, these associations were malleable and convenient to early alchemists attempting to conceal their activities behind textual code names. But in the Middle Ages, these associations solidified and many alchemists used personified of symbolic images of planets in order to further conceal the specifics of their experiments.[59] The link between medieval alchemy and astrology is most clear when we look at the alchemists' use of terrestrial astrology and the connections they made between the alignments of the planets and the ideal times to conduct experiments. "When alchemists work under a waxing moon, for example, they obtain purer metals."[60]

The *Splendor Solis*, written in Latin and German on parchment in 1582 and once owned by King Charles II of England, exemplifies terrestrial astrology and deeply coded alchemical illustration to a fantastic degree. Consisting of twenty-two full-page colorful miniatures, and as many pages of coded language in beautifully flourished gothic script, achieving a coherent interpretation of the manuscript is exceedingly difficult. The symbolic illuminations in alchemical manuscripts exemplify perfectly the mysterious nature surrounding the practice. As historian Sandy Feinstein notes in her article "Horsing Around: Framing Alchemy in the Manuscript Illustrations of the Splendor Solis", "the stages of the alchemical processes are

[58] Newman, *Medieval Alchemy*, 389-90.
[59] When detailing combinations or transmutations of metals through images, gold was depicted as the sun, silver the moon, copper Venus, iron Mars, tin Jupiter, lead Saturn and quicksilver Mercury. Of course, these associations were only a small portion of the codenames and code images used by alchemists.
[60] Kieckhefer, *Magic in the Middle Ages*, 134.

indicated by conventional allegorical images and allusions intended to reinforce the mystery of the secret of secrets while also seeming to provide access to it."[61] A reader who was not familiar with such notation would *think* they were understanding the text but would only be scratching the surface of its often layered theoretical, theological and chemical meanings.

One of the most misleading and complex aspects of the *Splendor Solis* is the fact that the illustrations and text within each chapter do not relate to each other. According to the note the first modern editor of the manuscript glossed in the margins, the title itself indicates that there are two stories being told simultaneously within the volume: "Splendor Solis stands for both Gold Splendour and Soul Splendour, and intends to convey the secret of physical alchemy by the text, and of spiritual alchemy by the allegorical pictures."[62] But it is clear that the double meaning can also be found solely within the pictures. Take, for example, the third illumination within the *Splendor Solis* on folio 10r. It depicts the sun and the moon in the top half of the page, representing gold and silver, and human figures, one king and one queen, standing on top of fire and Earth respectively (fig. 2). From a theological reading of the illustration, the unification of the queen with her Earth and the king with his fire symbolizes the end of the world, i.e. the collision of heaven and earth.[63] From an alchemically instructive reading of the same illustration, the king and queen represent two of the most important metals in alchemy: mercury and sulfur—the two ingredients of the philosopher's stone. The queen's scroll is inscribed with the words *Lac Viramium* (virgin's milk) and the king's is inscribed with the words *Coagula Maaschculium*

[61] Sandy Feinstein, "Horsing Around: Framing Alchemy in the Manuscript Illustrations of the Splendor Solis," *Sixteenth Century Journal: Journal of Early Modern Studies* 37, no. 3 (2006 Fall 2006): 673–99, esp. 673.
[62] Feinstein, *Horsing Around*, 678.
[63] Feinstein, *Horsing Around*, 679.

(masculine coagulation), seemingly referring to the cold, wet, liquid and "female" associations of Mercury and the hot, dry, flammable, "male" aspects of sulfur.[64]

Figure 2. The alchemical wedding. British Library, Harley MS 3469, The Splendor Solis, f. 10r.

This illustration is clearly a depiction of the "alchemical marriage"; the king (sulfur) and queen (mercury) represent two people united by love (most commonly a representation of salt, a tempering agent for the reaction between the two metals).[65] The interaction between mercury, sulfur, and salt produces the "son," an androgynous humanoid symbol for the sun, gold, or philosopher's stone itself.[66] The alchemical

[64] This translation assumes that the scrolls should read *Lac Virginum* and *Coagulum Masculinum* respectively; Principe and Light, *Alchemy*, 29.

[65] Emmanuel Le Bouter, "The Two Marriages in Alchemy," *The Rose + Croix Journal* 4 (2007): 73–89.

[66] This unification between a king and queen and their child is mentioned in the Emerald Table, the most significant early allegorical work of alchemy discussed previously. Mercury, Sulfur and salt constructed the "Prima Materia," an alchemist's base materials for their work: salt. In illustrated depiction of the combination of two metals, a marriage is often used. The tempering agent in the actual practical combination of the two obvious metals is often not depicted at all, but something the reader must figure out based on the context of the illustration. The Splendor Solis goes on throughout its pages to depict both the "son" as an actual child conducting transmutations within a cucurbit flask, and as the sun god Apollo traveling in his chariot above each scene where transmutations are taking place.

wedding depicted in the *Splendor Solis*, and in many other alchemical manuscripts, acted as a symbolic representation of the ultimate process of alchemy.

When showing chemical processes through pictures, illuminators often hid the true alchemical instructions under one or more layers of symbolism and story. Within some of the other pages of the *Splendor Solis*, we see a repeated artistic framing technique: the magical or allegorical alchemical symbolism is contained within a frame floating mid-scene in the foreground, while the more mundane and relatable depictions of medieval life appear in the background.[67] This had the effect of grounding the often ethereal subject matter in the reader's own life through familiar scenes, and allowed for a more immersive, quasi-devotional reading of these texts.[68] Illuminators were clearly involved enough in the practice of alchemy to drop relevant clues and commentary within their work. But, like most of the scribes of these manuscripts, their identities are unknown.

According to Feinstein, "whoever the authors and artists, in alchemy, all the parts work separately and together as clues and signs, recipes and directions; they are secret messages revealed to the believers … It is understood that these allegorical texts must be deconstructed and reconstructed; that for the process to succeed, attention to the smallest detail, however seemingly inconsequential, is necessary."[69] Because of the layered allegorical imagery and theological commentary within these texts, alchemy continued to flounder without an academic home within the university-based scholarly community throughout the fourteenth, fifteenth, and sixteenth centuries; a single discipline could not be assigned to the practice. This had the effect of keeping the development of alchemical manuscripts somewhat separate from those in other

[67] This framing technique can be seen in the illustrations on folios 23r, 24r, 25r, 26r, 27r, 28r, and 29r.
[68] As witnessed in many Books of Hours, depicting familiar scenes alongside religious themes and allegory allows for a more visual devotional experience for the reader.
[69] Feinstein, *Horsing Around*, 698.

disciplines. Not only were there fewer manuscripts written, they were more likely to be preserved and handed down from owner to owner, and they were more heavily edited during the copying process—often at the expense of hidden meaning and detail.

Many genres of books transitioned from manuscript to print quickly and completely. But, because of its limited audience and complicated scribal and illustrative content, alchemy was not one of those genres. "Many important medieval manuscript texts existed for generations in manuscript only."[70] Alchemical printed books were really only produced in the late sixteenth and seventeenth centuries and the printers did not often ensure that they had the most accurate exemplar of a text before beginning. Unfortunately, since alchemical notation and instruction needed to be extremely precise for the successful completion of the work, printed copies that unwittingly corrected or added words commonly bulldozed the original author's potentially coded meaning. Since very few modern critical editions of alchemical texts exist, modern historians must examine and compare multiple versions of the same text to catch these changes and discover the texts' true meanings. Marginalia are a gold mine of clarification and act as an archive of long-lost texts now only in existence through these notes. Studying how, and in what context, these manuscripts were used and read can help us discover how alchemical ideology evolved, changed, and inspired later iterations of chemistry, theology, and natural philosophy.

It is the tendency of modern historians to consider alchemy as a precursor to modern chemistry because of the scientific techniques it helped to develop. However, unlike chemistry, alchemy was also firmly based within a religious understanding of the universe; alchemists were constantly seeking to understand the building blocks of Creation to become closer to God. In their quest, they used allegorical language and assumptions on the abstract and spiritual unity of

[70] Principe and Light, Alchemy, 6.

the world in an effort to understand metallurgical and medicinal concepts. Medieval alchemy was not a mechanical art or technology but a combination of both theory and practice that originated in natural philosophy and picked up aspects of other disciplines along the way.[71] In the seventeenth and eighteenth centuries, the gradual division of church and state mirrored the final division of arts from sciences. This further fragmentation of the branches of knowledge no longer allowed for a discipline that was at once a chemical and mineral technological venture and a theological framework; ultimately, the practice of alchemy in its original form disappeared from public intellectual discourse in the late-eighteenth century and became absorbed into the rapidly growing field of chemistry accelerated by the development of the modern scientific method. Studying medieval alchemical manuscripts allows modern historians to understand the complex network that existed between natural magic, material science, theology, philosophy, medicine, and chemistry. Within each codex, historians are able to observe complex intersections of a wide variety of subjects and witness the practice of a truly interdisciplinary subject.

[71] Newman, *Medieval Alchemy, 386.*