ABSTRACT

Late antiquity has been characterized as an era when science and rational thought were in decline, eclipsed by irrational magico-religious philosophies and pseudo-sciences such as theurgy, astrology, and alchemy. I argue that new paradigms are needed in the study of religion that go beyond these stereotypes and more accurately reflect the perspectives of the practitioners, using as a case study Zosimus of Panopolis, who incorporates Hermetic and "gnostic" ideas into his alchemical theory and practice and is considered the founder of religious alchemy. I examine the nexus of science, religion, and magic in his work and in the broader context of Greco-Roman culture, and analyze how these epistemologies are configured in light of ancient views of "nature" and what is "natural."

My theoretical approach builds upon the work of Bruno Latour, Stanley Tambiah and others who have exposed the ways in which scholarly analyses of science, magic, and religion often privilege modern notions of rationality and construe the viewpoints and practices of the "other" as its opposite. I argue that modern views of nature and science are frequently defined in contradistinction to "primitive" or "pre-modern" notions of cosmic sympathy—a theory of nature upon which alchemy is based—and that modern tendencies to conceptually separate nature and culture have led to several misunderstandings of Greco-Egyptian alchemy. My thesis is that conceptualizations of nature are crucial for understanding both ancient and modern delineations of science, magic, and religion; this type of analysis is also useful for interrogating modern biases and arriving at more nuanced interpretations of ancient perspectives.

ZOSIMUS OF PANOPOLIS:
ALCHEMY, NATURE, AND RELIGION IN LATE ANTIQUITY

By

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INTRODUCTION

When studying late antique religions, ancient as well as modern categories of magic, religion, and science often become quite blurred. Alchemy, which began to flourish in this period, poses new questions and problems for scholars in regard to these categories. This dissertation focuses on the Greco-Egyptian alchemist Zosimus of Panopolis (ca. 270 CE), who was the first to frame alchemy as a chemico-religious philosophy and practice; he believed that piety, meditation, and divine revelation contribute to the effective transmutation of metals. Zosimus's religious interpretations of alchemy place him at a nexus of late ancient science, religion, and magic that has rarely been explored. My claim is that by concentrating on Zosimus's concepts of "nature" and what is "natural," we can better understand his perceptions of the relationships between magic, religion, and science, and that such an analysis has implications for understanding the complexity and varied use of these categories in late antiquity, as well as for interrogating modern biases toward magic, religion, and science in the study of ancient religions.

Historiographical issues in the study of alchemy

Alchemy is typically defined as the practice of transmuting base metals into gold, and such practices are considered to be the origins of modern chemistry. "Western" alchemy (as opposed to Chinese or Indian alchemy, which have somewhat different aims and practices) is thought to have originated in Greece or Egypt at the dawn of the common era. The earliest Greco-Egyptian alchemical texts were written in Greek and incorporate ideas from Hellenistic philosophy and religion. Many of the

texts were also translated into Arabic and Syriac, and alchemy flourished among Arab scientists and philosophers during the so-called Dark Ages of Europe. Europeans began to take a serious interest in alchemy in the early twelfth century, shortly after the Crusades, and it was practiced there until the eighteenth century, when it underwent a virtual demise during the Enlightenment. Religious language and imagery are hallmarks of alchemical literature, and the demise of alchemy was in part due to new understandings of chemistry that refuted alchemical notions of transmutation, but also related to general tendencies toward the secularization of scientific knowledge in modern Europe.[1]

Alchemy is often labeled as a "pseudo-science" and associated with magic and occultism. Laurence Principe and William Newman claim that these characterizations are related to two basic approaches to the historiography of alchemy, which have their roots in Enlightenment scientific debates as well as in Romantic critiques of Newtonian science. The first approach, which I will call the Enlightenment approach, dates from the beginning of the eighteenth century when etymological distinctions between "alchemy" and "chemistry" began appearing in force as an attempt to distinguish alchemy from the burgeoning science of chemistry.[2] Prior to this time, the terms "alchemy" and "chemistry" had been used interchangeably in reference to chemical experiments, pharmacology, and to gold-making, but in the eighteenth century "alchemy" came to be used almost exclusively to designate gold-making practices,

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[1] There are several general histories of alchemy available. See E.J. Holmyard, *Alchemy* (New York: Dover Publications, 1990 [1957]); and Allison Coudert, *Alchemy: The Philosopher's Stone* (London: Wildwood House, 1980).

[2] Lawrence M. Principe and William R. Newman, "Some Problems with the Historiography of Alchemy," in *Secrets of Nature: Astrology and Alchemy in Early Modern Europe*, ed. W. Newman and A. Grafton (Cambridge: MIT Press, 2001), 386.

which were now more widely associated with charlatanism and fraud.[3] Principe and Newman point out that Enlightenment writers often described chemistry as a light triumphantly shining forth from the obscure and deluded darkness of the alchemical past. These Enlightenment metaphors and attitudes continue to appear in contemporary histories of alchemy.[4]

The initial consequence of this separation of alchemy and chemistry, or, in Principe and Newman's terms, "the recasting of alchemy as 'other' to chemistry," is that the religious and esoteric aspects of alchemy became more pronounced. In the eighteenth century, Pietists, masons, and secret societies began using alchemical imagery in exclusively spiritual contexts (i.e., divorcing the religious symbolism from its meaning in the laboratory). By the nineteenth century alchemy was largely associated with natural magic, theurgy, astrology, and other so-called occult sciences.[5] The association of alchemy and the occult has often been used to discredit alchemy, to reinforce a distinction between "rational" chemistry and "irrational" alchemy. However, nineteenth-century occultists (the interest in occultism in this period is attributed to Romantic influences[6]) celebrated and popularized the notion of alchemy as an esoteric mystical practice. They claimed that the chemical operations were actually codes for spiritual realities, used as a foil to conceal the mystical wisdom of alchemy from the uninitiated. This esoteric interpretation of alchemy, which Principe and

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[3] A fuller treatment of this etymological shift can be found in another article by the same authors. See W. Newman and L. Principe, "Alchemy vs. Chemistry: The Etymological Origins of a Historiographical Mistake," *Early Science and Medicine* 3 (1998): 32-65.

[4] Ibid. Many scholarly works on early Greco-Egyptian alchemy, especially those written by historians of science, convey these "Enlightenment" attitudes. See, for example, F. Sherwood Taylor, *The Alchemists* (St. Albans: Paladin, 1976 [1952]); A.J. Hopkins, *Alchemy: Child of Greek Philosophy*, (New York: AMS Press, 1967 [1933]); and a more recent article by P.T. Keyser, "Alchemy in the Ancient World: From Science to Magic," *Illinois Classical Studies* 15 (1990): 353-378.

[5] Principe and Newman, "Some Problems with the Historiography of Alchemy," 387.

[6] Ibid., 385.

Newman call the "spiritual" interpretation, has been influential in twentieth-century studies of alchemy, both popular and academic. The authors cite C.G. Jung and Mircea Eliade, along with a few historians of science, as examples of a predominantly "spiritual" approach because of their claims that alchemy is essentially a psychological and spiritual pursuit, and that chemistry plays only a secondary role, if it is even practiced at all.[7]

Principe and Newman argue that while alchemy was often expressed in religious language, it was rarely, if ever, a spiritual practice entirely divorced from laboratory work, and that the religious language of alchemy needs to be decoded into a "language of the laboratory and of natural philosophy."[8] I argue that in Zosimus's case, it is not always possible to translate his religious language into laboratory operations, or *vice versa*, and furthermore, that his natural philosophy is primarily a *religious* philosophy. The religious and practical aspects of alchemy should be understood in tandem, especially when focusing specifically on alchemy as a body of theory and practice, and I will avoid the "spiritual" approach, which reduces chemical language to codes for psychological and spiritual processes, and also take care not to view the religious language merely as codes for chemical operations, though they may indeed operate as such in some cases.

While I think that the religious and practical aspects of alchemy should be understood in tandem, I also think that to some extent they can (or should) at times be

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[7] Jung's psychological theories of alchemy have been enormously influential on twentieth-century alchemical scholarship, including Eliade's treatment of the subject. Principe and Newman do not discuss the notion promoted by Antoine Faivre and others that alchemy is part of a pervasive religious current in Western culture, which has been dubbed "Western esotericism." This approach to the study of alchemy would no doubt fall under the rubric of "spiritual" interpretations. For examples of the "Western esoteric" approach to alchemy, see Faivre, *Access to Western Esotericism* (Albany: SUNY Press, 1994), esp. Part One and pp. 13, 52.

[8] Principe and Newman, "Some Problems with the Historiography of Alchemy," 418.

considered separately. The religious and philosophical dimensions of alchemical thought are often inspired by ideas circulating in the culture at large—in the case of Greco-Egyptian alchemy these would include Neoplatonism, Hermetism, Judaism, and "magical" lore, to name a few. In this sense the religious aspects of alchemy can be studied apart from the technical, if we are looking, for example, at Zosimus's religious thought as an expression of his cultural milieu. Zosimus believes that divine revelation, meditation, and piety are crucial to his work; he often chastises other alchemists for their ignorance of divine reality and associates his rivals with magic and deceit. Yet it is important to note that many of his alchemical recipes have nothing to do with religion whatsoever. This indicates that Zosimus's religious thought and practical work are not always continuous. To study the religious and practical aspects of alchemy in tandem, then, involves paying attention to when they are fused together, and when they are not.

Principe and Newman also note, rightly, that scholars should not essentialize alchemy by viewing it as a unified phenomenon, but should rather aim to study the diversity and complexity of alchemy in particular historical contexts. I hope to contribute to this effort with this case study of Zosimus of Panopolis. One of my concerns has been whether or not to use the term "alchemy" in describing Zosimus's work, because the term is anachronistic for this time period. What we call "alchemy" is most often called the "Sacred Art" (*hiera technē*) by early Greco-Egyptian alchemists; they also use the terms *chrūsopoēia* and *argūropoēia* (gold-making and silver-making),

and, more rarely, they call it *chēmia* (also *chūmia*).[9] However, I have decided to retain use of the term "alchemy" because it is an Arabic term that was probably derived from the *chēmia* of the Greco-Egyptian alchemists, and in modern parlance it denotes an art of transmuting metals that has religious dimensions, and this aptly describes my subject.[10] I use it with an awareness of the connotations it has—alchemy as a form of magic or "occultish" pseudo-science—in hopes that I can dispel some of these stereotypes, not perpetuate them. I also use it with an awareness of its etymological history and the way it has been portrayed by historians since the eighteenth century, though I disagree with the way Principe and Newman have situated debates over physical and spiritual chemistry solely in a modern historiographical context. Distinctions between technical and spiritual approaches to chemistry can be found throughout the entire history of Western alchemical literature as internal debates between alchemists themselves, and these may have contributed to "modern" interpretations of alchemy. Alchemical literature, including Zosimus's writings, often contains polemics against other alchemists, and this illustrates how a variety of "alchemies" were operating and perceived in different time periods. These differences and internal debates should not be overlooked.

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[9] Zosimus's use of the term *chēmia* is one of the earliest instances of the word. There is much speculation about where this term comes from, but its exact etymological origins remain unknown. Arabs added the definite article *al* to this term, which gives us our word "alchemy." See Newman and Principe, "Alchemy vs. Chemistry," 38; Robert Halleux, *Les Textes Alchimiques* (Turnhout, Belgium: Brepols, 1979), 45-47; and Jack Lindsay, *The Origins of Alchemy in Graeco-Roman Egypt* (London: Frederick Muller, 1970), ch. 4.

[10] F. S. Taylor bases his definition of alchemy on the title and contents of one of the earliest Greco-Egyptian alchemical manuscripts, the *Phūsika kai Mūstika* of Ps.-Democritus. He says that this title "succinctly expresses…the nature of the Art it describes—which may be defined as:--*An art, purporting to relate to the transmutation of metals, and described in a terminology at once Physical and Mystical*." See Taylor, "The Origins of Greek Alchemy," *Ambix* 1 (1937-38), 30.

Magic, Religion, and Science

Is Greco-Egyptian alchemy best understood as a form of magic, science, or religion? Contemporary scholarship on early alchemy—and there is not much of it—shows a tendency to classify alchemy under one or another of these headings. Most often it is presented either as a type of ancient science, or as a form of ancient magic.[11] Naomi Janowitz, who has recently made an attempt to "rescue" alchemy from its association with magic, treats it as a form of ritual practice, thereby placing alchemy closer to the sphere of "religion."[12] The problem with relegating alchemy to a particular category within what Bronislaw Malinowski has called the "three-cornered constellation" of magic-religion-science is that it skews our understanding of alchemy.[13] When treated as ancient science, the chemical operations and natural philosophy get emphasized; when treated as magic or religion, the mystical and ritualistic elements are brought to the fore. I have already argued that the practical and religious aspects of alchemy need to be understood in tandem, but I will add here that Greco-Egyptian alchemy also needs to be understood as an amalgamation of magic, science, and religion. In this era alchemy exhibits both scientific and religious characteristics, and also incorporates legendary figures such as Ostanes and Ps-Democritus, who were renowned as "magicians" (*magoi*) in late antiquity, as well as

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[11] See, for example, G. Irby-Massie and P.T. Keyser, *Greek Science of the Hellenistic Era* (London: Routledge, 2002), ch. 9; Georg Luck, *Arcana Mundi: Magic and the Occult in the Greek and Roman Worlds* (Baltimore: John Hopkins University Press, 1985), ch. 6; and Naomi Janowitz, *Magic in the Roman World* (London: Routledge, 2001), ch. 4.

[12] N. Janowitz, *Icons of Power: Ritual Practices in Late Antiquity* (University Park, PA: Pennsylvania State University Press, 2002), ch. 7. On her goal of rescuing these rituals, see p. xiii.

[13] Malinowski portrayed the "three-cornered constellation" of magic-science-religion as interrelated components of society and of human thought. See *Magic, Science, Religion and Other Essays* (Glencoe, IL: The Free Press, 1948); he uses the term "three-cornered constellation" on p. 69. See also Walter Capps's discussion of how this contributed to a more "organic" model for thinking about magic, science, and religion in *Religious Studies: The Making of a Discipline* (Minneapolis: Fortress Press, 1995), 98.

certain practices, such as using astrological calculations and invoking daemons, which some people considered to be "magical." Alchemical literature from this period also reveals a preoccupation with magic, religion, and science as competing forms of knowledge. For example, Zosimus, who believes that nature can only be understood through divine revelation, criticizes Aristotle's works as being inspired merely by daemons, and not by gods, which is akin to saying that Aristotelian science is too "materialistic." Zosimus is also critical of magic, and he chastises alchemists who practice it.

A fuller understanding of Zosimus and Greco-Egyptian alchemy can be achieved by looking at how the *interrelationships* between magic, religion, and science are operating within alchemy as well as in the broader context of late ancient culture. The interrelationships between magic-science-religion are protean in nature, always shifting as they take on different associations, values, and connotations in particular times, places, and individuals. These categories are also problematic: they often overlap, and to designate something as magic, science, or religion is often tied to personal or cultural biases regarding their validity as epistemologies and practices. My study of Zosimus also addresses how these categories are perceived in modern Western culture and presented in our scholarship, and how modern notions of magic, science, and religion have clouded our understanding of ancient alchemy.

Magic, religion, and science, and how they relate to one another, has of course been a much-debated issue by anthropologists and scholars of religion. Scholars have proposed various relationships among the three categories, and magic is always the most problematic of the three. James Frazer and E.B. Tylor, who conceived of an

evolutionary scheme in which human thought evolves from magical to religious to scientific ways of thinking, associated magic with science because they both share an empirical basis, though they claim that magic is "bad" science, or "pseudo-science" because it gives faulty results. As I have shown, alchemy has often been conceptualized this way, as a type of magic or pseudo-science as opposed to the rational science of chemistry. Magic and religion have also been grouped together as "sacred" forms of knowledge, as opposed to the "profane" or secular knowledge of science.[14] When religion and magic are associated, magic is usually treated as an inferior or deviant form of religion. As Jonathan Z. Smith argues,

> [I]n academic discourse "magic" has almost always been treated as a contrast term, a shadow reality known only by looking at the reflection of its opposite ("religion," "science") in a distorting fun-house mirror. Or, to put this another way, within the academy, "magic" has been made to play the role of an evaluative rather than an interpretive term, and, as such, usually bears a negative valence.[15]

Current attempts to "rescue" rituals from their association with magic and reclassify them as "religious" are common amongst contemporary scholars of late antiquity, and this is usually to avoid the negative connotations of magic.[16] This negative evaluation of magic is not always the case with alchemy, however, for alchemy—*especially* when it is viewed as a form of magic or occult science—has been treated by scholars as a

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[14] Malinowski made this sacred/profane distinction in *Magic, Science, Religion and Other Essays* (1948). Cf. Stanley Tambiah, *Magic, Science, Religion, and the Scope of Rationality* (Cambridge: Cambridge University Press, 1990), 67.

[15] J.Z. Smith, "Trading Places," *Ancient Magic and Ritual Power*, ed. M. Meyer and P. Mirecki (Boston: Brill, 2001), 16.

[16] Scholars of ancient magic debate over whether magic should more properly be considered as "religion," whether we should use magic as a descriptive or theoretical category in second-order discourse or abandon it, etc. Because magic is, as J.Z. Smith claims, a "shadowy other" often defined in contrast to religion or science, there is even the question of whether we can call magic a category of thought, for it almost always turns up empty (see Smith, "Trading Places," 16). However, the category does persist, as people of different times and places have imagined "magical" forms of knowledge. I see no reason to abandon it, only to use it cautiously, with an awareness of its elusive quality and our own individual and/or cultural biases toward the term.

repository of spiritual wisdom. This view is typical of "spiritual" interpreters of alchemy, who distinguish the "sacred" (magical/religious) aspects of alchemy from a "profane" emphasis on physical chemistry. Magic is still an evaluative term in this case, but with a positive valence rather than a negative one.

Religion and science can, of course, be evaluative terms as well. When magic is considered inferior to either of them, there is an implicit claim that religion and science are better paths to knowledge, that they are more appropriate means of seeking truth. These truth claims can be deeply ingrained ways of thinking that we may not necessarily be aware of. Scholars who have deconstructed modern theories of magic, religion, and science have revealed some of the truth claims implicit within those theories, such as the modernist (and colonialist) biases toward rationality, progress, objectivity, and empiricism that are often at play and used as "yardsticks" with which to measure other cultures.[17] These biases are often viewed as legacies from the scientific revolution of the Enlightenment era, and also from Protestantism, which shares Enlightenment values of progress and reason. Keith Thomas, for example, has argued that modern distinctions between magic and religion have their roots in Protestant criticisms of Catholic ritualism, which Protestants condemned as "sacramental magic."[18] More recently, Peter Pels has claimed that "modern discourses position magic as their antithesis, reinventing it in the process," and shows how fetishism, shamanism, magic, and occultism have been defined by scholars as the antithesis of modernity, either directly, as when these are considered to be backward, irrational

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[17] See, for example, Tambiah, *Magic, Science, Religion, and the Scope of Rationality*; and B. Meyer and P. Pels, eds., *Magic and Modernity* (Stanford: Stanford University Press, 2003).

[18] Keith Thomas, *Religion and the Decline of Magic* (New York: Oxford University Press, 1971), 51-57; see also Tambiah's discussion of Thomas in *Magic, Science, Religion and the Scope of Rationality*, 18-19.

beliefs, or by way of comparison, as when modern occultism is studied as a counterpoint or response to modernist notions of development and rationality.[19]

Of course, biases regarding magic, religion, and science can be found operating in ancient truth claims, as well.[20] As G.E.R. Lloyd has argued, the ancient Greeks had categories of thought that are commensurable with our own notions of magic, religion, and science.[21] The terms *mageia* and *magoi* ("magicians") originally referred to Persian priests. Zoroaster, for example, was hailed as the father of the *magoi*.[22] By the latter fifth and early fourth centuries BCE, these terms were used to describe various non-civic (often foreign) religious practices, including ecstatic forms of worship, mystery cults, and people who were religious healers and itinerant beggar priests.[23] The term "magic" was most often used polemically, as a way of discrediting these practices, but sometimes it was used positively, in idealizing the magical wisdom and powers of the ancients, or of holy people, especially those from the East.

There is no equivalent term for our word "religion" in ancient Greece, but the concept is reflected in the classical period as traditional civic piety and worship of the gods. New concepts of "religion" also formed in this period, such as Plato's philosophical notions of transcendence and purification of the soul. The Greeks often thought of religion and magic in terms of acceptable and marginal practices. When

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[19] See Pels's introduction to *Magic and Modernity*, 4. Principe and Newman's study of how modern historiographies of alchemy are rooted in Enlightenment/Romantic debates can be seen as an example of this latter "counterpoint" approach.

[20] This is not to say that scholars in other fields are unaware of this. Tambiah notes, for example, that modernist distinctions between religion and magic are similar to notions of magic in ancient Greece, as well as to notions of idolatry in the Hebrew Bible. See Tambiah, *Magic, Science, Religion and the Scope of Rationality*, 6-11, 19.

[21] See G.E.R. Lloyd, *Magic, Reason, and Experience* (Indianapolis: Hackett, 1999).

[22] The word *magos* was originally used as a term for Persian priests or religious wise men. Herotodus, Xenophon, and Plato all describe the *magoi* as Persian priests. See Graf, *Magic in the Ancient World*, 20.

[23] Ibid., 21, 34.

mystery cults became more popular and widespread in the Hellenistic period, these came to be considered less as "magical" or marginal religious practices, and more as normative ones.

A rough equivalent for "scientists" in Greek is *phūsiologoi*, or nature philosophers; this is what Aristotle called the Presocratic philosophers who attempted to explain the causes and structure of the physical world.[24] Lloyd has identified three criteria by which we can claim that the Greeks possessed similar concepts to modern science:

1) The demarcation of natural and divine causes.
2) The development of mathematics and logical argumentation, used to formulate demonstrations and proofs.
3) Increasing use of methods of demonstration and proof, combined with empirical observation and research, to extend the empirical base of knowledge.[25]

Ancient Greece had its mathematicians, physicists, astronomers, geographers, physicians, zoologists, and so forth, all of whom were inquirers into nature and exhibited some form of scientific reasoning. However, religion and science were often closely intertwined in natural philosophy: nearly all philosophers believed that nature was divine, though they had differing conceptions of nature and the divine. Some science bordered on the mystical, such as the mathematics of Pythagoras, who was reputed to be a holy man. And natural sciences were sometimes associated with magic, especially medicine and astrology, which was considered a branch of astronomy.[26]

As Lloyd and many others have noted, these demarcations between magic, science, and religion (especially philosophical religion as opposed to traditional

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[24] Lloyd, *Magic, Reason, and Experience*, 32.
[25] I am paraphrasing Tambiah's summary of Lloyd's criteria. See Tambiah, *Magic, Science, Religion and the Scope of Rationality*, 9.
[26] Pliny (1st c. CE), for example, claims that magic originated from medicine combined with astrology. See Pliny, *Natural History* 30.1.1.

religion) arose out of debates in the sixth-to-fourth centuries BCE over differing conceptions of divinity and nature. The Presocratic nature philosophers rejected traditional notions of the gods, and though they conceived of nature as a divine force, their explanations of the universe were often materialistic. Anaxagoras, for example, famously claimed that Helios, the sun god, is nothing but a glowing lump of metal.[27] Plato's philosophical understanding of religion, and his critiques of traditional civic religion, arose from such debates. These debates also helped to shape magic as a category of thought. This is evident in a late fifth-century medical text, *On the Sacred Disease*, in which divine causes for epilepsy are rejected in favor of natural ones. The author writes:

> In my opinion, those who first attributed a sacred character to this malady were like the magicians, purifiers, begging priests and charlatans of our own day, men who claim great piety and superior knowledge. Being at a loss and having no treatment that would help, they sheltered themselves behind the divine and called this illness sacred, in order to conceal their utter ignorance.[28]

In late antiquity, magic, religion, and science take on additional meanings and configurations. The configuration that I will be focusing on is how "religious" truth claims are privileged over "scientific" and "magical" ones. We see this in Zosimus, who thinks that magic and Aristotelian science are inferior forms of knowledge, and that "true" knowledge is acquired through divine revelation. Neoplatonist philosophers of this era, such as the theurgist Iamblichus, make similar claims.[29] E.R. Dodds has famously described the intellectual climate of this age as a "return of the irrational,"

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[27] See Walter Burkert, *Greek Religion* (Cambridge: Harvard University Press, 1985), 316.
[28] Cited from Graf, *Magic in the Ancient World*, 30-31.
[29] Iamblichus thinks that theurgy, which involves divine revelation, is superior to philosophical knowledge that involves "conjecture or opinion or some form of syllogistic reasoning." *DM* I.3. Clarke, et al., say that this is a reference to Aristotelian syllogistic. See Emma Clarke, et al., *Iamblichus:* De Mysteriis (Atlanta: Society of Biblical Literature, 2003), 15, n. 27. On "anti-Aristotelian" sentiments in Neoplatonic nature philosophy, see S. Sambursky, *The Physical World of Late Antiquity* (Princeton: Princeton University Press, 1962).

which began in the Hellenistic era with the decline of Greek rationalism (i.e., science and philosophy), and the rise of "magical" systems such as astrology and theories of cosmic sympathy that were allegedly systematized by Bolus of Mendes (c. 200 BCE).[30] Alchemy, which arose during this period, is often classified as one of these irrational, magical pseudo-sciences that mark the decline of Greek rationality.[31] Dodds, of course, is not responsible for creating this portrayal of alchemy, but his emphasis on rationality and irrationality is emblematic of the way alchemy has been portrayed since the Enlightenment, and remains deeply ingrained in our perceptions of alchemy. My intent is not so much to rescue alchemy from its association with magic, but rather from viewing it through modernist lenses of rationality *versus* irrationality. This tendency is prevalent in most of the available scholarship on early Greco-Egyptian alchemy, and it obscures our understanding of alchemy rather than elucidating it.

Peter Brown rejects Dodds's picture of late antiquity as an age of irrational superstition and intellectual deprivation, and argues that the increasing emphasis on magic and miracles in this period is due to a shift in the "*locus* of the supernatural." He writes:

> In this period, "divine power" came to be defined with increasing clarity as the opposite of all other forms of power. The "*locus* of the supernatural," where this unique power was operative, came to stand for a zone in human life where decisions, obligations, experiences, and information were deemed to come from outside the human community.[32]

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[30] E.R. Dodds, *The Greeks and the Irrational* (Berkeley: University of California Press, 1951), 244-247. Bolus of Mendes, who is called "The Democritian," is presumed by some scholars to be the author of a well-known alchemical text called *Phūsika kai Mūstika*, attributed to Democritus.

[31] This view is reiterated in most of the scholarship available on Greek science and early alchemy. See, for example, Sambursky, *The Physical World of Late Antiquity*, xii, 59.

[32] Peter Brown, *The Making of Late Antiquity* (Cambridge: Harvard University Press, 1978), 11.

Brown explains that the question of whether beliefs and practices were rational or irrational was not debated as much as the *legitimacy* of different forms of supernatural power, especially "heavenly" and "earthly" powers.[33] Brown's emphasis on the locus and legitimacy of supernatural powers (which are also associated with forms of knowledge) is useful, and, I think, an accurate depiction of late ancient concerns. However, as Janowitz has pointed out, various beliefs and practices that scholars have deemed "supernatural" were often considered *natural* by ancient standards, and in many cases scholars have translated the word "natural" (*phūsikos*) in ancient texts as "supernatural" or "magical," which obscures the original meaning.[34] Therefore, I will be cautious in translating these terms so that I can depict more accurately ancient concepts.

In order to understand Zosimean alchemy, I will be examining the distinctions and continuities between nature and the divine that are at the heart of debates over magical, religious, and scientific knowledge in late antiquity. Late antique religion and philosophy is preeminently concerned with cosmology, due to new understandings of the cosmos advanced by astronomers in Plato's day and perfected by Ptolemy in the second century CE. According to this cosmology, the earth is surrounded by concentric planetary spheres, and the fixed stars are viewed as the border between the cosmos and the divine realms beyond. "Nature" often designated everything below the fixed stars, as well as the divine force that governed the cosmos; it is sometimes associated with Fate. Knowledge and power were also located on this cosmic map. In the religious

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[33] Ibid., 61.
[34] Janowitz, *Magic in the Roman World*, 68-69. Liddell and Scott also note that in the third century CE, *phūsikos* begins to take on supernatural or magical connotations. See the entry for *phūsikos* in Liddell and Scott's *Greek-English Lexicon* (Oxford: Clarendon Press, 1940).

imaginary of late antiquity, the cosmic and divine realms were populated by daemons, angels, and various other powers, and knowledge was associated with various beings from the different realms. For example, daemons from the realms beneath the fixed stars granted cosmic knowledge and power. This type of knowledge was attributed to magicians, as well as to people immersed in worldly knowledge and worldly affairs. Holy or pious people, on the other hand, were allegedly in direct contact with beings in the divine realms beyond the cosmos, and their knowledge and powers were therefore considered superior because they came from a higher, purer source. There were, of course, different attitudes toward nature and the divine operating in this time period, but this cosmic map was used by a variety of religious and philosophical groups as a way of identifying various forms of knowledge and power, and in determining what Brown calls the "*locus* of the supernatural." This cosmic map figures prominently in Zosimus's thought, and I will use it to locate his views of nature and the divine and how this translates into his work with metals.

Methodology and Chapter Summaries

As I have already indicated, my approach to Zosimean alchemy is aligned with contemporary trends in scholarship that aim to understand ancient beliefs and practices from the perspective of the practitioners. This is not simply to take them at face value, however, but also to look for motives and other considerations that may lead them to portray their beliefs and practices in a particular light. Kenneth Burke's work on understanding human motivations is helpful in this regard, particularly his notion of rhetoric as identification, which is premised on his theory that language is symbolic action, and that actions arise from motives. According to Burke, the "basic function of

rhetoric [is] the use of words by human agents to form attitudes or to induce actions in other human agents…."[35] By analyzing the ways in which a person identifies with certain people, groups, ideas, or imagery and distances him/herself from others, one can gain insight into a person's motives and into the nature of motivation in general. Burke explains that identification also extends beyond a person's autonomous activities:

> Any specialized activity participates in a larger unit of action. "Identification" is a word for the autonomous activity's place in this wider context, a place with which the agent may be unconcerned. The shepherd *qua* shepherd acts for the good of the sheep, to protect them from discomfiture and harm. But he may be "identified" with a project that is raising the sheep for market.[36]

Zosimus's writings are largely comprised of letters to his associates, and he aims to teach and to persuade them of the validity of certain beliefs and practices—both religious and technical. Following Burke's theory of rhetoric as identification, I will be paying attention to the people and ideas that Zosimus affiliates with, as well as those he distances himself from. I will begin by examining Zosimus's "autonomous" alchemical practices and the dynamics of his industry, and proceed to look at his religious thought in light of religious and philosophical ideas circulating amongst his associates and in the culture at large. I will also be looking at how identification operates in natural and divine contexts, such as the way Zosimus identifies with the "spirits" of the metals and with daemons, angels, and other divine beings.

The first chapter of this dissertation is an introduction to Zosimus and early Greco-Egyptian alchemy. Historians of early alchemy often overlook the industrial contexts of alchemy, other than to speculate that alchemy originated in Egyptian temples or was practiced by dyers, jewelers, and counterfeiters. I argue that Zosimus

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[35] Kenneth Burke, *A Rhetoric of Motives* (Berkeley: University of California Press, 1950), 41.
[36] Ibid., 27.

probably began his career as a priest and statue-maker in an Egyptian temple, and that his craft is largely concerned with the coloration of metals. Furthermore, I argue that early alchemical notions of transmutation are based on changes in color, not with fundamental changes in the nature of the metals themselves. That is to say, they did not believe that they were changing base metals into gold; they were quite aware that they were coloring metals. I also discuss Zosimus's affiliations and rivalries with other alchemists, and how his theories of alchemy compare to those of other early alchemists.

In the second chapter I use Pierre Hadot's work on "spiritual exercises" in ancient philosophy in order to illustrate and contextualize Zosimus's concepts of alchemy as a spiritual practice. I give a close reading of *On Excellence,* Zosimus's allegory of the alchemical opus, in which he portrays alchemy as a sacrificial ritual. This allegory is the most famous of Zosimus's works, and I argue that this text needs to be understood in the context of late ancient debates over animal sacrifice and how meditation, or offering one's thoughts to God, was being touted as a more pious form of sacrifice, and also as a spiritual practice whereby the divine would reveal the mysteries of the cosmos.

Zosimus frequently praises the Hebrews—particularly an alchemist named Maria the Jewess—for their skill in metallurgy. In the third chapter I argue that Zosimus was attempting to synthesize Egyptian and Jewish metallurgical techniques, and that since he had a religious approach to alchemy, this synthesis was religious as well as technical. I demonstrate the ways in which Zosimus uses Jewish and Christian thought to differentiate between "natural" and "unnatural" methods of alchemy, and I argue that various concepts of Fate, divine power and the natural order are at the heart

of these alchemical debates over divine (natural) *versus* daemonic (unnatural) revelation.

Alchemy is often associated with theurgy, but no attempts have been made to provide detailed comparisons of the two. In Chapter Four I compare Zosimean alchemy with the theurgical writings of Iamblichus and argue that they share similar foundations, especially their critiques of human reason and insistence that higher knowledge comes through divine revelation; their ritual use of material objects to sympathetically link the natural and divine realms and thereby facilitate the soul's ascent; and their integration of science and religion (Iamblichus is a Pythagorean mathematician). I contend that theurgy is a scientific ideal as well as a religious one, and I illustrate this through the figures of the Hermetic and Pythagorean sage, who are upheld by Zosimus and Iamblichus as models of a theurgical approach to science.

Cosmic sympathy, the theory that all parts of the universe are connected by invisible forces that link the microcosm to the macrocosm, is a hallmark of late ancient views of nature. It is also a hallmark of the "new sciences" which begin to appear in this period, such as alchemy and astrology. In the concluding chapter I argue that cosmic sympathy is a major obstacle to understanding ancient science and religion, since modern views of nature and science are often defined in contradistinction to "pre-modern" or "primitive" notions of cosmic sympathy. Using the work of Bruno Latour, I argue that modern tendencies to conceptually separate nature and culture lie at the root of several common misrepresentations of alchemy, and that nature/culture debates are foundational to both ancient and modern demarcations of magic, science, and religion. I review Zosimus's distinctions between "natural" and "unnatural" in light of

these dynamics, and argue that paying attention to both ancient and modern truth claims regarding nature is useful for getting beyond modern biases and arriving at more nuanced interpretations of ancient perspectives regarding magic, science, and religion.

Primary Sources

The surviving remains of Zosimus's writings come from Arabian collections of early Greek alchemical works, preserved in Greek, Syriac, Arabic, and Latin. The Greek manuscripts, dating from the tenth to fifteenth centuries, contain 109 pages of Zosimus's writings and are the largest collection of his works.[37] A French translation of these manuscripts, entitled *Collection des Alchimistes Grecs*, was published in 1888 by M. Berthelot and C.-E. Ruelle, but it is difficult to sort out Zosimus's writings in this collection since they are lumped together indiscriminately with ancient commentaries on Zosimus's works. The ordering of the texts is also problematic. For example, Zosimus's allegory of the alchemical opus, *On Excellence*, is a complete work divided into three sections, yet in this collection the sections are interrupted by shorter chapters on various chemical procedures that are clearly not part of *On Excellence*. More recently, in the late 1980s, philologist Michèle Mertens undertook the project of sorting out Zosimus's writings in these Greek manuscripts. She has catalogued them and organized them into four groups: *Authentic Memoirs*, *Chapters to Eusebia*, *Chapters to Theodorus*, and *Book of Sophe* and *Final Account*, which together constitute the last

[37] The Greek manuscripts are *Marcianus graecus* 299 (tenth or eleventh century), *Parisini graecus* 2325 (thirteenth century) and 2327 (fifteenth century), and *Laurentianus graecus* 86, 16 (fifteenth century). For complete information on these manuscripts and a catalogue of Zosimus's writings in the Greek, Syriac, Arabic, and Latin alchemical manuscripts, see Michèle Mertens's introduction in *Zosime de Panopolis: Mémoires authentiques*, Les Alchimistes Grecs, Tome IV, 1re partie (Paris: Les Belles Lettres, 1995), xii-cxii.

group. In 1995 she published an excellent French translation of *Authentic Memoirs* as part of the Budé series, *Les Alchimistes Grecs*, edited by H.D. Saffrey. Only three volumes of this series (projected at twelve volumes) have appeared since 1981; Mertens's volume is the only one that deals with Zosimus. Her cataloguing of the Greek material by Zosimus is of immense value to my research. I also prefer her translation, but will rely largely on Berthelot and Ruelle's translation (and the original Greek) for the remaining Greek texts.

About sixty-four pages of Zosimus's writings appear in three Syriac alchemical manuscripts from the fifteenth and sixteenth centuries, housed at Cambridge University and at the British Museum.[38] These were collected by Berthelot, translated into French by R. Duval, and published in 1893 in a three volume series entitled *La Chimie au Moyen Age*. The Syriac collection contains different material than the Greek, including a substantial amount of Zosimus's religious writings. Of particular interest are portions of a work on alchemy that Zosimus allegedly wrote in twenty-eight books, with each book titled after a letter of the Greek alphabet. Only one of these books survives in the Greek manuscripts (*On the Letter Omega*), and it appears to be incomplete, but several more of these books survive in full in the Syriac manuscripts. These writings, addressed to Zosimus's colleague, Theosebia, typically explain a particular aspect of the alchemical work using both technical and religious language; therefore, they are invaluable for understanding Zosimus's religious interpretations of alchemy.

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[38] The Cambridge manuscript is numbered Mm 6.29 (fifteenth century); the two at the British Museum are Egerton 709 (fifteenth century) and Oriental 1593 (fifteenth or sixteenth century). See Mertens, *ibid*, lxxiv and lxxvii.

The Arabic and Latin alchemical manuscripts contain only a few pages of Zosimus's works.[39] The Arabic manuscripts, which date from the thirteenth to fifteenth centuries, include a list of titles of books written by Zosimus, most of which are now lost; they also include some of Zosimus's writings, but most of these are also found in the Greek manuscripts. The Latin manuscripts (thirteenth or fourteenth centuries) include portions of Zosimus's *Chapters to Eusebia*, which can also be found in the Greek manuscripts.[40]

[39] See Mertens, "Project for a New Edition of Zosimus of Panopolis," in *Alchemy Revisited: Proceedings of the International Conference on the History of Alchemy at the University of Groningen, 17-19 April 1989*, ed. Z.R.W.M. von Martels (Leiden: Brill, 1990), 122, n. 7.
[40] For a list of names and contents of the Arabic and Latin manuscripts, see Mertens, *Zosime de Panopolis: Mémoires authentiques*, lxxviii-lxxxvi.

CHAPTER ONE:

ZOSIMUS AND GRECO-EGYPTIAN ALCHEMY

Greco-Egyptian alchemy originated in the first century CE among metallurgists, dyers, jewelers, and artisans whose crafts involved color fabrication.[1] Many of the techniques for coloring metals and gemstones that are found in Greco-Egyptian alchemical texts had actually been practiced by Near Eastern craftsmen for centuries.[2] While alchemical texts reveal some new advances in these arts—namely, the invention of distillation and the discovery of the chemical properties of sulfur, arsenic, and mercury vapors—these technological advances are not what distinguishes alchemy from ancient craftsmanship.[3] What is different about alchemy is the application of Hellenistic philosophical and religious theories to these crafts.[4]

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[1] It is difficult to date the origins of Greco-Egyptian alchemy because of the fact that most of the texts are copies found in manuscripts dating from the tenth-fifteenth centuries, but scholars generally agree on a first century CE origin. The Leiden and Stockholm (or Holmiensis) papyri are the earliest extant copies of "alchemical" documents—though there is debate over whether these should be considered "chemical" or "alchemical" texts. These documents, which were probably found in Thebes, date from the third century CE and contain recipes dealing with metallurgy, dyeing, and the manufacture of *faux* precious stones. These recipes are thought to be scribal copies of earlier originals, for they show no stains or other evidence of being used as workshop manuals. For information on the dates and collections of Greco-Egyptian alchemical texts, see F.S. Taylor, "A Survey of Greek Alchemy," *The Journal of Hellenic Studies* 50, part 1 (1930): 110-123; and Robert Halleux, *Papyrus de Leyde, Papyrus de Stockholm Recettes*, Les Alchimistes Grecs, Tome I (Paris: Les Belles Lettres, 1981), 5-14. On alchemy and color fabrication, see A.J. Hopkins, "Earliest Alchemy," *The Scientific Monthly* 6:6 [1918], 531-533; and Philip Ball, *Bright Earth: Art and the Invention of Color* (New York: Farrar, Straus and Giroux, 2002), ch. 4.

[2] See R.J. Forbes, *Studies in Ancient Technology* I (Leiden: Brill, 1955), 125-128.

[3] Some scholars have claimed that alchemy is based on the discovery of distillation, but there are indications that distillation was known, in some form, to Sumerians, Babylonians and to ancient Greeks. However, the distillatory techniques and apparatuses of Greco-Egyptian metallurgists are "revolutionary" compared with earlier descriptions. See Robert Multhauf, *The Origins of Chemistry* (London: Oldbourne, 1966), 109. A description of an ancient Sumerian still can be found in P.T. Keyser, "Alchemy in the Ancient World: From Science to Magic," 362-363. For a discussion of the development of Greek and Greco-Egyptian distillation techniques, see F.S. Taylor, *The Alchemists*, 39-50.

[4] See Taylor, "A Survey of Greek Alchemy," 109-110; and Joseph Needham, *Science and Civilisation in China*, Vol. 5, Part II (Cambridge: Cambridge University Press, 1974), 26.

The earliest Greco-Egyptian alchemical texts are notable for their philosophical reflections on color changes and chemical reactions, which are often described in terms of the transmutation of the four elements, the unity of nature ("One is All" is a popular alchemical phrase[5]), and the death and resurrection of the "spirits" of metals. For example, in a second-century text known as *The Dialogue of Cleopatra and the Philosophers*, Ostanes asks Cleopatra, a teacher of alchemy, to "Enlighten us, casting your light upon the elements. Tell us how the highest descends to the lowest and how the lowest rises to the highest, and how that which is in the midst approaches the highest and is united to it, and what is the element which accomplishes these things."[6]

Cleopatra responds:

> The waters, when they come, awaken the bodies and spirits, which are imprisoned and weak. For they again undergo oppression and are enclosed in Hades, and yet in a little while they grow and rise up and put on diverse glorious colors like the flowers in springtime, and the spring itself rejoices and is glad at the beauty they wear.
>
> …When they are clothed in the glory from the fire and the shining color thereof, then will appear their hidden glory, their sought-for beauty, being transformed to the divine state of fusion.[7]
>
> …For the womb of fire has given them birth and they have clothed themselves in glory. It has brought them to a single unity; their likeness has been perfected in body, soul and spirit and they have become one. For fire has been subjected to water, and earth to air, in the same way as air with fire, and earth with water, and fire and water with earth, and water with air, and they have become one.[8]

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[5] See the *Chrysopoeia of Cleopatra* (2nd c. CE) in *CAG* I, Fig. 11, p. 132, which consists of various diagrams of chemical symbols and apparatus, along with drawings of the serpent Ouroboros inscribed with statements such as: "One is All," and "One is All and through it is All and by it is All and if you have not All, All is nothing." Taylor's translation, "Origins of Greek Alchemy," 43.

[6] Taylor's translation, *The Alchemists*, 55-56. The full text is found in *CAG* IV.20, under the (probably late) title of *Book of Comarius, Philosopher and High Priest. Teachings of Cleopatra on the Divine and Sacred Art of the Philosopher's Stone*.

[7] Ibid. Compare with *CAG* IV.20.8-10.

[8] Adapted from a translation by C.A. Browne, in "Rhetorical and Religious Aspects of Greek Alchemy, Part II," *Ambix* 3 (1948), 24. About three-fourths of the entire Cleopatra dialogue is reprinted in a commentary on an alchemical poem by Archelaos (7th-8th c.), which is where this portion of the translation comes from. The text is the same as that of the Cleopatra dialogue in the *Book of Comarius*, *CAG* IV.20.16.

Though religious concepts, such as the resurrection of spirits from the underworld, are found in this text and in others from the same period, Zosimus of Panopolis, who was most likely writing in the late third and early fourth centuries CE, is often hailed as the founder of religious alchemy.[9] As A.-J. Festugière has argued, Zosimus is the first alchemist to portray alchemy in a soteriological manner, as a technique not only for purifying metals, but also for purifying the human soul.[10] Whereas earlier alchemical texts make analogies between religious and metallic purification, Zosimus integrates them into a unified practice, inaugurating the notion of alchemy—to paraphrase F. Sherwood Taylor—as an art that is at once both physical and mystical. He thus plays a pivotal role in the history of Greco-Egyptian alchemy. Later alchemists laud him as the "crown of philosophers," and "the divine Zosimus," which shows that he was highly respected for his contributions to alchemical thought.[11] The works of Zosimus are some of the earliest examples of an alchemist writing under his or her own name, rather than using a pseudonym; he is also the most prolific of the early alchemical authors. He purportedly wrote an encyclopedia of alchemy in twenty-eight books, and portions of this work have survived, as well as many additional writings, letters, and metallurgical recipes.[12] Unfortunately, very little is known about

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[9] Scholars generally agree on a date of around 300 CE, with the exception of Ingeborg Hammer-Jensen, who dates Zosimus at 500 CE. See I. Hammer-Jensen, *Die älteste Alchemie* (Copenhagen: Host & Son, 1921), 99. Most ancient sources call Zosimus a Panopolitan, but a few claim that he was from Thebes. See Howard Jackson, *Zosimos of Panopolis on the Letter Omega* (Missoula: Scholars Press, 1978), 11, nn. 7, 8. Jackson suggests that Thebes (*Thebaios*) could mean a dweller from the Thebaid region of Upper Egypt, which is where Panopolis is located (in present-day Akhmim). In the *Suda*, Zosimus is listed as an Alexandrian. He may have lived or traveled there at some point. See M. Mertens, *Zosime de Panopolis: Mémoires authentiques*, xiii-xiv.

[10] A.-J. Festugière, *La Révélation D'Hermès Trismégiste*, Vol. I, 2nd ed. (Paris: Gabalda, 1950), 260-262.

[11] On honorific titles given to Zosimus, see Mertens, *Zosime de Panopolis: Mémoires authentiques,* xi.

[12] Zosimus's encyclopedia is mentioned in the *Suda*, where it says that each book was named after a letter of the Greek alphabet. A handful of these survive. Since the Greek alphabet has only twenty-four letters, it is unclear how Zosimus distributed the letters. See Jackson, *Zosimos of Panopolis on the Letter Omega*, 6.

his life. From his writings, it appears that Zosimus was a teacher of alchemy, that he was probably employed as an artisan in an Egyptian temple complex at one time, and that he was well versed in Hermetic and "gnostic" literature. His religious ideas are largely based in these traditions.

In this chapter I will introduce the craft, industry, and theoretical foundations of early alchemy, and show how Zosimus is situated in each of these contexts. First I will address the question of whether alchemists were producing real or artificial gold, since this is a thorny issue in the study of alchemy. I will also be looking at the products alchemists were making and attempt to reconstruct what Zosimus's profession may have been like. The science of alchemy and how it relates to magic and religion will also be explored.

Transmutation of metals

Alchemy has, of course, long been defined as the art of transmuting base metals into gold. This definition is problematic for scholars of Greco-Egyptian alchemy, however, because 1) ancient notions of "gold" are different from modern ones,[13] and 2) there is a lack of evidence that early alchemists believed they were literally transforming base metals into precious ones; rather, they seem to be cognizant that they were either coloring metals to give them the appearance of precious ones, or purifying gold and silver from natural contaminants, as the case may be.

An illustration of the first problem, that gold was viewed differently in the Greco-Roman period, comes from Pliny the Elder (1st c. CE), who claims that gold can

[13] Modern-day chemists define gold as an irreducible metallic element with the atomic number of 79 and aggregate atomic weight of 197.2. See M.P. Crosland, *Historical Studies in the Language of Chemistry* (New York: Dover, 1978 [1962]), 56.

be made from orpiment (a yellow arsenic sulphide). He reports that Emperor Caligula, who was "extremely covetous for gold," once ordered great quantities of orpiment to be smelted.[14] Pliny says that orpiment did, in fact, "produce excellent gold," but in such small quantities that Caligula abandoned the project and "no one afterwards has repeated the experiment."[15] This is the earliest known reference to metallic transmutation in Greco-Roman literature, and regardless of whether the story is true or not, it does appear that Pliny thinks it is possible to transform orpiment into gold. Others may have believed this, as well. As Taylor argues,

> The men of those times had no conception that there existed one and only one exactly defined chemical individual called *gold*. There were all sorts of golds, some very good, others not so good. They were, however, all "gold" to the ancients, not mixtures of one pure gold with varying proportions of base metal. Gold was something shining, heavy, yellow, untarnishable, and resistant to fire.[16]

On the other hand, specialists in metallurgy, including early alchemists, seem to have a more sophisticated understanding of the different qualities and kinds of gold, and would certainly be able to distinguish gold from orpiment. Various assay tests were used in antiquity to detect pure gold from adulterated gold. These include weight tests and the touchstone test, which involves rubbing gold on a black stone and examining the color of the streak left behind.[17] A fire test known as cupellation was also used. Cupellation is a method of refining gold by heating it with lead, which causes base metals and other impurities to oxidize and separate from the gold, but as an assay test, cupellation can reveal the presence of base metals and other impurities by

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[14] Pliny, *NH* 30.22. Translated by H. Rackham.
[15] Ibid.
[16] Taylor, *The Alchemists*, 34.
[17] Ibid. Also, see J. F. Healy, *Mining and Metallurgy in the Greek and Roman World* (London: Thames and Hudson, 1978), 203-209.

the oxides that appear.[18] These assaying techniques were certainly known to metallurgists, but the average person may not have been able to tell the difference between gold and orpiment, and may indeed have believed that anything closely resembling gold in weight and color *is* gold. This is probably true of the average person today, as well.

A majority of the recipes in the Greco-Egyptian alchemical literature are for the manufacture and coloring of metal alloys, the debasing of gold (i.e., making gold of different carat-weights), and the superficial coloring of metals with tinctures.[19] There are also recipes for making dyes, mordants (which fix the dyes), and inks, as well as for making *faux* gemstones and pearls, probably for costume jewelry. Some of the recipes in the Leiden and Stockholm papyri (3rd c.) even show intentions of counterfeiting:[20]

> *P. Leid.* No. 39: [The metal] will be like the finest quality *asem* (i.e., electrum, a natural alloy of silver and gold), to the point that it will deceive even the artisans.[21]
>
> *P. Leid.* No. 37 (on making imitation gold rings): [T]he objects of copper appear as gold and can neither be detected by fire nor by rubbing on the stone….[22]

In his influential study of Chinese alchemy, Joseph Needham calls the difference between gold-faking and gold-making "aurifiction" vs. "aurifaction."

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[18] Cupellation was known to ancient Egyptians and Babylonians, and even today it is considered the most accurate assaying method. See Needham, *Science and Civilisation in China* V, Part II, 36-41.
[19] Taylor, *A Survey of Greek Alchemy*, 127-130. For more detail about these techniques, see Taylor, *The Alchemists*, 36-50.
[20] It is debatable whether or not these can be called "alchemical" texts, and it remains a controversial issue among scholars. Many of the recipes in the Leiden and Stockholm papyri are also found in alchemical texts, but the L. and S. papyri differ in that they do not include any philosophical reflection or theories of transmutation. See Halleux, *Papyrus de Leyde, Papyrus de Stockholm Recettes*, 24-30.
[21] Needham quotes these passages, but with different numbering, in *Science and Civilisation in China* V, Part II, 18. The translations here are adapted from Halleux, *Papyrus de Leyde, Papyrus de Stockholm Recettes*. His French translation for No. 39 reads: "…Ce sera comme de l'asèm de première qualité, au point de tromper même les artisans."
[22] Ibid., No. 37: "Que les objets de cuivre paraissent en or et ne soient détectés ni par le feu ni par le frottement à la pierre et que cette fantaisie fasse surtout effet sur un anneau."

Aurifiction, he says, is the "conscious imitation of gold (and other precious substances), often with specific intent to deceive."[23] Whether or not the artisans intend to deceive their clients with these products, or are openly acknowledging that they are making imitations, the artisans would be aware that their products are, "in the workshop sense, 'false.'"[24] People who followed the recipes of the Leiden and Stockholm papyri would certainly fall under this category.

Aurifaction, on the other hand, is defined by Needham as a "belief that it is possible to make gold (or 'a' gold, or an artificial 'gold') indistinguishable from, and as good as (if not better than), natural gold, from other quite different substances, notably the ignoble metals."[25] He claims that this was the belief of Greco-Egyptian alchemists, and also claims that these alchemists were philosophers, and probably *not* professional metallurgists. Needham explains that alchemists erroneously believed that they were making real gold because, like the average person, they considered gold to be anything that had the form or quality of gold, and they were probably unfamiliar with cupellation tests.[26] One of the earliest Greco-Egyptian alchemical texts, *Phūsika kai Mūstika* (1st or 2nd c., attributed to Democritus), is cited by Needham as an example of aurifaction. This text contains numerous recipes for tinting metals and making alloys, some of which are similar to those found in the Leiden and Stockholm papyri, but Ps-Democritus often makes claims like, "thus you will obtain gold," which Needham interprets as a belief in the transmutation of base metals.[27] However, Needham takes these phrases about obtaining gold out of context. Looking at the entire recipe, one can

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[23] Needham, 10. The parenthetical remark is a shortened version of Needham's.
[24] Ibid.
[25] Ibid., 11.
[26] Ibid., 10-11.
[27] Ibid., 20. On the similarities to the Leiden and Stockholm papyri, see Berthelot's notes to *CAG* II.1.

see that these recipes are about gold-coloring, not making real gold: "Add yellow silver (i.e., electrum) and you will have gold; with the resulting gold you will have coral of gold reduced in a metallic body."[28] "Coral of gold" is described in other alchemical recipes as a red-colored substance used to tint gold.[29] Most of the recipes for "gold-making" in this text are for obtaining a golden-colored tincture (or varnish?) called "shell of gold."[30] There is no indication that this author believed he was turning base metals into pure gold.

Needham's claim that Greco-Egyptian alchemists were primarily philosophers who misunderstood the recipes of the artisans is not well supported by the literature. Zosimus's writings, as I will explain shortly, indicate that alchemical texts were copied and produced by scribal priests, and that there were alchemists who were more or less talented than others, but this does not indicate a stark division between philosophers (or scribes) and artisans, the former being intellectual dilettantes with only a superficial knowledge of metallurgy, and the latter being skilled craftspeople who were fully aware that they were creating imitation gold.[31] Furthermore, the earliest alchemical texts (1st to 4th centuries CE) tend to be either philosophical in nature, as in the case with *The*

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[28] This is the recipe cited by Needham. See *CAG* II.1.4: "Ajoutez de l'argent jaune et vous aurez de l'or; avec l'or (le résultat) sera du chrysocorail réduit en corps (métallique)." John Maxson Stillman (Needham cites Stillman's translation of this recipe) claims that these recipes clearly intend to "give copper or bronze a superficial silver or gold color by the use of mercury alloys or arsenic alloys." See J.M. Stillman, *The Story of Alchemy and Early Chemistry* (New York: Dover, 1960 [1924]), 157.

[29] See, for example, *CAG* II.2.5, where coral of gold is described as a powerful substance that has the color of cinnabar.

[30] See *CAG* II.1.6: "Puis ajoutez de l'argent, pour avoir de l'or; et de l'or, pour avoir la coquille d'or." Also, *CAG* II.1.7: "Et si vous ajoutez ce composé à l'argent, vous obtiendrez de l'or; si vous l'ajoutez à l'or, vous obtiendrez de la coquille d'or." According to Berthelot's lexicon, "shell of gold" is also known as "liquor of gold," *CAG* II, 16.

[31] Older theorists of alchemy did not make such a divide, though Berthelot and others have puzzled over the differences in alchemical texts, some of which (they think) indicate transmutation of base metals, and others that clearly indicate they are making imitation gold. Needham introduces this theory of two distinct groups, the aurifictors (artisans), and aurifactors (philosophers) as a way of explaining these apparent discrepancies. See Needham, 46. His theory is frequently cited by contemporary scholars of alchemy.

Dialogue of Cleopatra cited at the beginning of this chapter, or technical recipes with little if any philosophical speculation. This could indicate that some artisans did not make use of alchemical theories, but again, it does not necessarily show a division between philosophers and artisans. Zosimus's writings, for example, are of two types: his technical recipes, which do not involve philosophical speculation, and his philosophical writings, which contain broader reflections upon the nature of chemistry, among other things. His technical writings indicate that he was a skilled metallurgist, not a dabbler.[32] It is possible that other alchemists wrote separate philosophical and technical works, as well.

Needham's theory perpetuates the old Enlightenment stereotype that alchemy is irrational, misguided, and has little to do with "real" chemistry. Arthur John Hopkins, an early scholar of Greco-Egyptian alchemy, has a more accurate (and less-biased) explanation of transmutation. Hopkins argues that Greco-Egyptian alchemical notions of transmutation are essentially describing changes in *color*, not fundamental changes in the metals themselves.[33] He claims that the notion of transmuting base metals into gold (which he calls "pseudo-alchemy") did not appear until the thirteenth century, and that it arose due to misinterpretations of ancient Greco-Egyptian theories, which were then being translated from Arabic alchemical texts.[34] Since early alchemy originated in color-making industries, and the recipes all involve coloration of some kind—as

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[32] See, for example, Stillman's assessment of Zosimus in *The Story of Alchemy and Early Chemistry*, 167.

[33] Hopkins first argued this in "Earliest Alchemy," published in 1918 (op.cit., n.1), and elaborated on his "color theory," as it came to be known, in "A Modern Theory of Alchemy," *Isis* 7:1 (1925).

[34] See Hopkins, "Earliest Alchemy," 536; and "A Modern Theory of Alchemy," 70-72. As Hopkins notes, the idea of physical transmutation was debated by both Arabic and European alchemists throughout the centuries. It was never a universal belief, yet scholars continue to define the goal of alchemy as the physical transmutation of base metals into gold.

Hopkins says, these texts abound in "color words"—Hopkins's theory of color-transmutation is highly plausible.[35]

Hopkins observes that in these alchemical texts, "[m]etals are defined by their color or even by the color which they are capable of receiving. Moreover, colors are aggressive, alchemical gold being capable of imparting yellowness to base metal alloys."[36] The equation of "gold" with the golden colors produced on metals is found throughout early alchemical texts. Zosimus often claims that his tinctures result in "true" gold, and by this he most likely means the quality of the golden color he has produced.

Greco-Egyptian alchemists frequently speak of metallic "bodies" and "spirits." The bodies are the physical metals, and the "spirits" (*pneumata*) of metals refer to their color, to tinctures, and also to volatile substances such as mercury, sulphur, and arsenic, which act upon the metals.[37] New distillation technologies may have contributed to this way of describing metals, for metallurgists could readily observe the sublimation of vapors in glass tubes, providing them with images of the "spirits" of metals leaving their bodies.[38] In *The Dialogue of Cleopatra* cited at the beginning of this chapter, the metallic bodies and spirits are imprisoned in Hades (the apparatus in which the metals are being fired), and eventually the spirits rise up like flowers in springtime, imparting glorious colors to the metallic bodies. Zosimus writes: "The mystery of the gold tincture is to change the bodies into spirits, in order to tint them into the state of

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[35] On "color words," see Hopkins, "A Modern Theory of Alchemy," 68.
[36] Ibid.
[37] See Berthelot's discussion, *CAG* I, 247-250.
[38] *Pneuma*, or spirit, also means "breath." Aristotle wrote that metals and minerals are formed by inhalations and exhalations of the earth (*Meteor.*III, 378a.20-378b.5). This was probably a common conception even before Aristotle. Miners would have been intimately familiar with vapors and gases in the mines (some of which are poisonous), and may have described them as breaths or spirits.

spirituality."[39] To color a metal, then, is to bring it to a state of "spirituality," or to "spiritualize" it.[40] Zosimus also uses the word "incorporeals" (*asōmata*) more or less interchangeably with spirits: "This conversion is called transmutation (*ekstrophē*) after the incorporeals have taken a body, by the effect of the art."[41] In this passage the incorporeals, or volatile substances, are the agents of transmutation. From these passages, one can see how easily the technical language of alchemy slips into religious concepts, and also how transmutation centers on coloring, or "spiritualizing" the metals.

Hopkins claims that a certain color sequence—black, white, yellow, and red/violet (*iōs*)—represents four stages of color transmutation.[42] He explains that the first step, blackening (*melanosis*), involves making an alloy out of copper and lead.[43] Oxidation gives this alloy a black color. The second step is to whiten the metal (*leukosis*), or impart a silver color to the alloy. Next, the alloy is yellowed (*xanthosis*), or made "gold." The final step is the reddening (*iōsis*), which is the creation of a reddish or violet colored tincture that is apparently formed within the gold-colored alloy. While these colors and procedures are mentioned in the Greco-Egyptian alchemical texts, they are not discussed as stages of transmutation, as Hopkins

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[39] Zosimus quoted by Pelagius, *CAG* IV.1.9.20. "Le mystère de la teinture d'or, c'est de changer les corps en esprits, afin de teindre dans l'état de spiritualité…"

[40] The phrase "spiritualize" is used several times in this quotation from Zosmius (ibid.) to refer to the coloring of a metal. For example, "Les agents de transformation dissolvent et spiritualisent; les agents coopérateurs sont ceux que l'on projette au moment de la fusion."

[41] Adapted from Hopkins' translation in *Alchemy: Child of Greek Philosophy*, 119. See *CAG* III.28.7.24.

[42] See Hopkins, "A Modern Theory of Alchemy," 65-66; and *Alchemy: Child of Greek Philosophy*, 92-103. This color sequence occurs frequently in European alchemical literature, where the colors are also associated with stages of spiritual growth, but this does not appear to be the case for Greco-Egyptian alchemy.

[43] There are a few different methods that make use of different base metals. See Hopkins, "A Study of the Kerotakis Process as Given by Zosimus and Later Alchemical Writers," *Isis* 29:2 (1938). In this article Hopkins outlines different methods of the four-stage coloration process, and corrects some of his earlier interpretations.

describes, but rather as a particular process for making gold-colored alloys using an apparatus called the *kērotakis*, which was allegedly invented by a female alchemist known as Maria the Jewess (2nd c. CE?).[44] Modern-day scientists have been able to reproduce the black–white–yellow color stages, but ancient alchemists do not give precise instructions for obtaining the much sought-after *iōs*, or red/violet.[45] The elusive *iōs* appears to be a precursor of the legendary "Philosopher's Stone," a mysterious alchemical substance believed to hold the power to transmute base metals into gold.[46] Although *iōs* carries different meanings in the alchemical texts, it often refers to a powerful reddish-gold substance that is used to color metals gold.[47] *Iōs* probably also refers to the creation of violet-colored bronzes or surface films.[48] Jewelry and other objects made of violet and rose-colored gold have been found in ancient Egyptian tombs, including that of Tutankhamun. Alfred Lucas, a chemist who has examined several of these objects, says that he found it difficult to analyze the chemical composition of the pink and violet surface films because they are extremely thin. He explains that the film is not a lacquer or varnish, but an iron oxide produced from within the metal by heating. The violet color does not dissipate when fired, and even

[44] See Taylor, "A Survey of Greek Alchemy," 131-133.
[45] See Taylor, ibid., and Keyser, "Alchemy in the Ancient World: From Science to Magic," 365-366.
[46] The term "Philosopher's Stone" did not enter into alchemical literature until the seventh century CE, but the seeds of this concept are found in Greco-Egyptian alchemical literature. Zosimus, for example, speaks of obtaining "a stone that is not a stone" (*CAG* III.2.1.). See Crosland, *Historical Studies in the Language of Chemistry*, 22.
[47] Another name for this reddish substance is "coral of gold." See note 28 above. *Iōs* also means "rust," and the word is used to describe various surface tarnishes; *iōs* of copper is verdigris, for example. See Hopkins, *Alchemy: Child of Greek Philosophy*, 97, n. 12; and Ball, *Bright Earth: Art and the Invention of Color*, 64.
[48] See Hopkins, *Alchemy: Child of Greek Philosophy*, 100-102; and Keyser, "Alchemy in the Ancient World," 366.

intensifies in some cases.[49] The production of this violet film is similar to descriptions of the production of *iōs* in Greco-Egyptian alchemical texts.

Zosimus's profession

Zosimus's writings contain numerous recipes for coloring metals, but his work entitled *On the Work of Copper (Letter Zeta*) is one of the few in which he mentions the kinds of objects he is making. In this text he gives instructions for making and coloring male and female statues, a technique he claims can also be used with figurines of animals, fish, birds, trees, and various other objects.[50] For the male statue, he says to "operate by forming <…> a Phrygian figure, important in the eyes of those who will see it and believe that it is a living being."[51] Apparently metallurgists were responsible not only for coloring metals, but also for casting the statues, which were then handed over to sculptors who refined the details.[52] Zosimus explains that further coloring of the statue is resumed "after having it filed."[53] The female figure he describes is made from four parts silver and one part gold. This mixture, he says, "has the appearance of a

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[49] A. Lucas, *Ancient Egyptian Materials and Industries* (London: Edward Arnold, 1962), 233-234.
[50] *CMA*, Syriac treatise II.6.2.
[51] *CMA*, Syr. II.6.8: "Opère en formant (? mot effacé) une figure phrygienne, considerable aux yeux de ceux qui la verront et qui croiront que c'est un être vivant."
[52] This seems to have been a common practice. Alison Burford gives a parallel example of the production of stone statues in Greco-Roman antiquity, which she says were often roughly hewn at the quarry before they were taken to sculptors. See A. Burford, *Craftsmen of Greek and Roman Society* (Ithaca: Cornell University Press, 1971), 76.
[53] Ibid.: "Si tu veux la faire couleur de cuivre de chaudron, mélange avec une partie de cuivre de Chypre, en fondant d'abord le cuivre plusieurs fois, jusqu'à ce qu'il devienne couleur de pourpre. Après l'avoir limé, mets-le avec ces quantities (des ingredients) qui t'ont été indiquées."

In another passage from this text (6.30), Zosimus says that people marvel over the beauty of the colors, and credit Pabapnidos, the son of Sitos, the "master of statues," with the invention of a particular bluish-white hue. His comments may be sarcastic, implying that people wrongly credit the sculptor for the color of the metal. A note in the margin, probably written by the copyist, says: "all passersby admire the idol and boast of the sculpted object, as made by Pabapnidos, son of Sitos, the imposter" ("Que tous les passants admirent l'idole et s'enorgueillissent de l'objet sculpté, comme le fit Pabapnidos, fils de Sitos, l'imposteur"). Whether or not this sentence was originally a part of Zosimus's Greek text is unknown, but this marginal note indicates that Pabapnidos is a sculptor who should not be credited for the color of the statues.

woman's flesh; it shines like lightning."[54] Brilliant though this silvery female figurine may be, his recipe is for coloring the statue black. According to Pliny, the Egyptians customarily stained their silver statues black, "so as to see portraits of their god Anubis in their vessels."[55] Pliny quips that the use of blackened silver "passed over even to our [Roman] triumphal statues, and, wonderful to relate, its price rises with the dimming of its brilliance."[56] Zosimus explains that the recipes for blackening silver were closely guarded: "This essential recipe was principal for the ancients, and it was kept hidden. Not only was the secret obligatory, but it was also prescribed by all the oaths that its mystery would be sanctioned."[57]

Zosimus also mentions crafting statues of Agathodaemon (the "good daemon") and the deities of Good Fortune, Destiny, the Earth, and the Nile, as if they were stock items in trade.[58] In another text, *On Electrum*, he refers to manuals for making talismans.[59] These statues and talismans were probably used for religious purposes, and since Zosimus also demonstrates an intimate familiarity with the work of Egyptian priests, it is likely that he worked as a metallurgist in an Egyptian temple complex. The precious and semi-precious metal statues that Zosimus and his colleagues created may have been used in the temples themselves, as funerary sculpture, or were perhaps purchased by wealthier clients.[60]

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[54] *CMA,* Syr. II.6.9: "Or, une partie; argent, quatre parties. Le mélange a l'apparence de la chair de femme; il brille comme un éclair."
[55] Pliny, *NH* XXXIII.46. Translated by H. Rackham.
[56] Ibid.
[57] *CMA*, Syr. II.6.4: "Cette recette capitale était la principale pour les anciens, et elle était tenue cachée. Non seulement le secret était obligatoire, mais il était aussi prescript par tous les serments qui en sanctionnaient le mystère."
[58] *CMA*, Syr. II.6.31.
[59] *CMA*, Syr. II.12.5.
[60] Though statues of Good Fortune, Destiny, and Agathodaemon would have popular appeal, the religious figurines that were sold at festivals or near the temple entrances were typically made of

In late antique Egypt, temple artisans worked in annexes that were under the supervision of the House of Life, a center of priestly learning that housed temple libraries and scriptoriums; it was also a center for the sciences, such as mathematics, medicine, and astronomy.[61] Zosimus's writings indicate that he was associated with the priesthood of the House of Life, though there is not enough evidence to ascertain precisely what his role was in relation to the priesthood. He mentions that priests are the keepers of the ancient books of the sacred art (alchemy), and that access to them is somewhat restricted; copies of these texts can only be read in the sanctuary of the temple.[62] These ancient recipes were written in hieroglyphics or hieratic script, or in some peculiar notation system difficult to decipher, since Zosimus often refers to the decoding of such texts. For example, he says, "the various symbols of the priests were explicated by the former masters and the different prophets [i.e., high-ranking Egyptian priests[63]], whose name became celebrated, and who prevailed with all the power of the science."[64] Zosimus is also an interpreter of these ancient recipes, though he says that he does not seek fame like the others.[65] Another indication that he was affiliated with the House of Life is his emphasis on astrological timing for the preparations of tinctures. Astronomer-priests were important members of the House of Life; they observed and kept records of the movements of the heavenly bodies, and were

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terracotta, and often manufactured by local craftspeople, not necessarily by priests or temple artisans. See David Frankfurter, *Religion in Roman Egypt* (Princeton: Princeton University Press, 1998), 132, 140, 215.

[61] See Ragnhild Bjerre Finnestad, "Temples of the Ptolemaic and Roman Periods: Ancient Traditions in New Contexts," in *Temples of Ancient Egypt*, ed. Byron Shafer (Ithaca: Cornell University Press, 1997), 228; and Serge Sauneron, *The Priests of Ancient Egypt* (Ithaca: Cornell University Press, 2000), 134.

[62] *CMA*, Syr. II.6.19.

[63] See Sauneron, *The Priests of Ancient Egypt*, 57-59.

[64] *CMA*, Syr. II.6.4: "[L]es divers symbols des prêtres ont été expliqués par les anciens maîtres et les différents prophètes, dont le nom est devenu célèbre, et qui ont prévalu avec toute la puissance de la science."

[65] Ibid.

consulted regarding propitious moments for both religious and non-cultic acts.[66] Zosimus claims that favorable timing is important in metallurgy, and he criticizes others for not adhering to this tradition.[67] Propitious timing is also found in more ancient craft traditions. Mesopotamian glass-making recipes dating from 1300-1100 BCE contain instructions for the astrological timing of various procedures, as well as for making ritual offerings to the gods and to the ancient masters of their craft.[68]

Zosimus was a master craftsman, a teacher of teachers. He served as an advisor to his colleagues, Theosebia and Nilus, who taught the alchemical arts to groups of disciples.[69] If Zosimus was a priest, he would have been a priest of fairly high rank, since he describes other master craftsmen as "prophets," a high-ranking class of priests. The high priest of the Temple of Ptah at Memphis, a renowned center of metallurgy and other crafts, bore the title of "Greatest of the Masters of Craftsmen," which is further evidence that master craftsmen were priests of high rank.[70] Zosimus says that Nilus is a priest, and later commentators refer to Theosebia as a priestess and as Zosimus's "sister."[71] There is no indication that Theosebia was a blood relative; "sister" is more likely a religious form of address. She was either a priestess or the leader of a craft

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[66] Finnestad, "Temples of the Ptolemaic and Roman Periods," 228.

[67] *Zosimos of Panopolis On the Letter Omega* 2-4, tr. H. Jackson. Jackson explains this passage in his introduction, p. 1.

[68] Another important group of Mesopotamian glass recipes was discovered at Nineveh and dates from the seventh century BCE. See Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: John Hopkins University Press, 2001), 79-81.

[69] On Theosebia and her disciples, see *CMA,* Syr. II.8.1; on Nilus and his disciples, see *CMA*, Syr. II.6.31.

[70] Byron E. Shafer, "Temples, Priests, and Rituals: An Overview," in *Temples of Ancient Egypt*, ed. B. Shafer (op.cit., n. 60), 10-11. Zosimus mentions visiting a temple in Memphis to inspect a furnace, and he also gives recipes for gold-making from the Temple of Ptah, so he probably had some connection with artisan-priests there.

[71] On Nilus as priest, see *CAG* III.27.8. On Theosebia as priestess, see, for example, the closing remarks to *CMA*, Syr. VI. "Fin du livre de Zosime, le philosophe, adressé à Théosébie, la prêtresse." The Suda entry on Zosimus reports that he addressed his writings on chemistry to his sister, Theosebia. This excerpt from the Suda is cited by M. Mertens, *Zosime de Panopolis: Mémoires Authentiques*, xcvii.

guild (or perhaps both), since Zosimus mentions that she formed an assembly of disciples and established oaths among them to protect the secrets of their art.[72] Theosebia is Zosimus's closest associate, and he respects her a great deal.[73] He fondly calls her "queen," and "woman of the purple robe."[74] Most of his writings are addressed to her, and these letters deal with religious subjects as well as alchemical techniques.

Most Egyptian priests served only part-time, on a rotation basis, so it is likely that Zosimus and his colleagues were also affiliated with professional guilds outside of the temple environment.[75] There is evidence of Jewish and Christian membership in craft guilds, or *collegia*, in late antique Egypt. Zosimus frequently writes about Hebrew metallurgists, their techniques, and especially their religious ideas, and he probably came to know them through the guilds.[76] Little is known about these craft associations; there were different types, with different functions and membership structures. Many of the guilds had a religious orientation; they honored a patron deity and helped support the cult of that deity.[77] In some, membership was structured hierarchically, and one entered the guild and moved up in its ranks through a series of initiations. The initiations sometimes involved vows of secrecy for the transmission of

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[72] *CMA*, Syr. II.8.1.
[73] Women play an important role in early alchemy. Maria the Jewess made great advancements in the art of distillation, and allegedly invented many alchemical apparatuses. Theosebia is a teacher of alchemy, and Zosimus mentions another female alchemist named Paphnutia, though he doesn't think much of her work. There are also several alchemical texts attributed to Cleopatra, but it is unknown whether this is a historical person, or a legendary figure based on the Ptolemaic queen(s) of Egypt.
[74] See, for example, *CMA,* Syr. II.8: "A Théosébie, la reine, salut!"; and *CAG* III.51.11: "ô femme à la robe de pourpre."
[75] On the part-time service of Egyptian priests, see Sauneron, *The Priests of Ancient Egypt*, 69; and Shafer, "Temples, Priests, and Rituals: An Overview," 9.
[76] On Jewish and Christian participation in *collegia*, see Christopher Haas, *Alexandria in Late Antiquity: Topography and Social Conflict* (Baltimore: John Hopkins University Press, 1997), 59, 236.
[77] See P. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance*, 75-76.

trade secrets, though this was not always the case.[78] The structure of guilds is similar to the Egyptian priesthood (and to Greco-Roman mystery religions), which also had its hierarchies, initiations, and oaths of secrecy. Zosimus is opposed to such secrecy. He chastises Theosebia for wanting to "hide the art," and for requiring oaths of secrecy from her students.[79] He writes, "If the mysteries are necessary, it is all the more important that everybody should possess a book of chemistry, which should not be hidden away."[80]

Zosimus claims that some of the well-known commentators on ancient texts have not only done a poor job of interpreting the ancient recipes, but they have also deliberately withheld pertinent information and have thus "spoiled the books of chemistry." He writes: "The Philosopher [probably a reference to Democritus] says that they have drowned in a great ocean the writings of the science of nature."[81] Zosimus accuses many commentators of seeking fame by attaching their names to the ancient recipes they have interpreted, and that "no one has prevented them. But they are blamed by the priests, by those that possess the books."[82] Zosimus also says that access to these books "must not become an object of envy, for this is also blamed by the priests."[83] Though Zosimus had achieved some renown for his interpretations of ancient recipes, he takes moral issue with his fame-seeking colleagues who withhold

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[78] Long demonstrates that there is a lack of evidence for secrecy in ancient craft guilds. She claims that while the "lack of evidence does not mean it did not exist…the assumption that widespread craft secrecy prevailed is not justified." The issue of secrecy, she says, is "best approached with caution." Ibid., 74.
[79] *CMA*, Syr. II.8.1.
[80] Ibid. Fowden's translation, *The Egyptian Hermes*, 125.
[81] *CMA*, Syr. II.8.1: "Mais ces commentateurs n'écrivirent rien de bon. Non seulement ils gâtèrent les livres de la chimie; mais ils en firent des mystères. Le Philosophe dit qu'ils noyèrent dans un grand océan les écrits de la science de la nature."
[82] *CMA*, Syr. II.6.19: "Beaucoup d'autres veulent donner leur nom aux recettes; personne ne les en empêche. Mais ils sont blâmés par les prêtres, par ceux qui possèdent les livres."
[83] Ibid.: "Cet usage ne doit pas devenir un objet d'envie, car il est blâmé aussi par les prêtres."

information and require oaths of secrecy from their students in order to protect their privileged status as experts. These people are motivated by vanity, desire, and jealousy, Zosimus says, and he wants nothing to do with them or their books. He writes:

> Having seen the degree of their stupidity and poverty of spirit, I diverted my face from all these writings, and I decided not to take them in hand anymore, and not to occupy myself with the vows, the jealousies and the excessive spitefulness; I gave up interpreting them, without any jealousy on my part, because they are the product of passion.[84]

In a long treatise called *Final Account*, Zosimus gives further details about alchemical traditions of secrecy. He attributes the origins of such practices to the fact that the kings of Egypt exercised strict control over mining, smelting, and other types of work dealing with precious metals. Artisan-priests were employees of the king, and were not allowed to reveal the secrets of their craft except when initiating other craftsmen in the service of the king, or passing the information on to their children who were continuing in the same trade.[85] Those who did not abide by the laws of secrecy were punished. Zosimus claims that the ancient priests engraved cryptographic recipes and maps (i.e., locations of mines) onto *stelai* and kept them hidden "in the darkness and depth of the temples…so that, even though one carried boldness to the point of penetrating into those dark depths, if one had neglected to learn the key, one could not decipher the characters for all one's boldness and trouble."[86]

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[84] *CMA*, Syr. II.6.4: "Ayant ainsi vu quel était le degree de leur sottise et de leur pauvreté d'esprit, j'ai détourné ma face de tous ces écrits, et je me suis decide à ne plus les prendre en main, et à ne plus m'occuper des serments, des jalousies et des méchancetés excessives; j'ai renoncé à les interpreter, sans aucune jalousie de ma part, parce qu'ils sont le produit de la passion."

[85] In ancient Egypt it was customary for children to be trained in the same profession as their fathers, and also to inherit priestly offices from their parents. See Sauneron, *The Priests of Ancient Egypt*, 43-44

[86] *CAG* III.51.5. See also A.-J. Festugière, *La Révélation d'Hermès Trismégiste Vol. I: L'Astrologie et les Sciences Occultes*, Appendix One, for the Greek text of Zosimus's *Final Account*, and pp. 275-281 for French translation. The quotation is from Jack Lindsay's translation (which is based on Festugière's), in *The Origins of Alchemy in Graeco-Roman Egypt*, 336.

Zosimus also distinguishes between two types of metallurgical arts and the secrecy requirements for each: the treatment of mineral ores (*psammoi*), and the creation of timely tinctures (*kairikai baphai*). The word *kairikos* means seasonal things, or opportune timing, so this probably refers to tinctures created at astrologically opportune moments. He is not clear about what these different procedures entail, but the production of tinctures most likely involved the use of distillation methods. He explains that the trade secrets of those who treat mineral ores are not as jealously guarded because this art is more public; it requires the use of furnaces, which "cannot be hidden away."[87] Whoever tried to treat mineral ores for their own profit, rather than the king's, would be easily detected. The timely tinctures, on the other hand, are created "out of view."[88] There is more opportunity for people to manufacture expensive goods secretly and independently, hence the need for stricter oaths to protect the trade secrets. Zosimus relates that some alchemists have been critical of Democritus and other ancient authors for not mentioning these two arts. "Their reproaches are unjust," he says:

> They could not do it, these men who were the friends of the kings of Egypt and who gloried in holding the first rank in the class of prophets. How could they have openly, against royal orders, set out in public their knowledge and give others the sovereign power of wealth? Even if they could have done it, they would not, for they were careful of their secrets. It was possible only for Jews, secretly, to operate, write, and publish these things. Indeed we find that Theophilos, son of Theogenes, has described all the country's goldmines, and we have Maria's treatise on furnaces as well as other writings by Jews.[89]

In these passages, Zosimus locates the origins of alchemical secrecy in the Egyptian royalty's "jealous" guarding of their hoards of gold. According to Festugière,

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[87] *CAG* III.51.3. Lindsay's translation, ibid., 336.
[88] Ibid.
[89] *CAG* III.51.2. Lindsay's translation, 335.

these are references to royal monopolies on gold-working in the era of Ptolemaic rule.[90] Zosimus is sympathetic to the ancient priests' need to protect the trade secrets out of loyalty to the king, but secrecy is undesirable, for it perpetuates envy and greed. He also seems to think that secrecy is no longer necessary. Many of the craft secrets had been published and circulated by Zosimus's time. Since the earliest alchemical texts date from around the time of the ascendancy of Roman rule in Egypt, it may have been the case that it was only possible to publish these trade secrets once the Ptolemaic government collapsed and their monopoly on precious metals had ended. Zosimus mentions that the Jews published some of these craft secrets, though he also notes that neither the ancient Egyptians nor the Jews or the Greeks had *ever* revealed the secrets of the timely tinctures.[91] "In the whole series of the ancients, I have found only Democritus making an allusion to it," he writes.[92] Some trade secrets were still closely guarded, but in Zosimus's day, this was probably due to increased competition as a result of the publication of recipes and more widespread dissemination of alchemical craft knowledge. The unpublished secrets were housed in the temples, in books copied from the ancient *stelai*, and Zosimus and other master craftsmen were engaged in the work of interpreting the symbolic characters and publishing their findings.

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[90] Festugière, *La Révélation d'Hermès Trismégiste* Vol. I, 276, n.1. Other scholars have argued that Zosimus could be responding to Emporer Diocletian's alleged banning of books dealing with *chēmia*, or the preparation of gold and silver, in 292. An entry for *chēmia* in the *Suda* states: "Diocletian, having sought out the books on this subject, burned them. Now, because of the revolutions, Diocletian treated the Egyptians harshly and cruelly and having sought out these books written by their forefathers on the chemistry of gold and silver, burned them lest wealth should accrue to the Egyptians through this art and lest they, emboldened by riches, should in the future revolt against the Romans." (*Suda* entry translated by A.J. Hopkins, *Alchemy: Child of Greek Philosophy*, Appendix II.) Zosimus locates this "jealousy of the kings" in ancient times, however, and he is probably writing earlier than Diocletian's edict, so this is unlikely. Moreover, it is difficult to ascertain the context of Diocletian's banning of these books. Would this have impacted artisans like Zosimus, or other types of metal-workers, such as those who minted coins? Diocletian did initiate a major currency reform in Egypt in 296. See Roger Bagnall, *Egypt in Late Antiquity* (Princeton: Princeton University Press, 1993), Appendix II.

[91] See *CAG* III.51.3.

[92] *CAG* III.51.3. Lindsay's translation, 336.

This is Zosimus's portrayal of the alchemical profession, at any rate; due to a lack of historical evidence, it is difficult to discern how much of this is fact or fiction. Secret recipes hidden in temples are recurring themes in alchemical literature, and are frequently the stuff of legend. For example, the *Phūsika kai Mūstika* of Ps-Democritus includes a story (thought to be a later interpolation[93]) about Democritus and other initiates whose master, Ostanes, had died before teaching them a certain alchemical procedure called "harmonizing natures."[94] They invoke their master's spirit from Hades and ask him for instruction. Ostanes replies that it is difficult to speak without permission of the daemon, and tells them only, "The books are in the temple." Despite all their searching, the initiates could not find the books. One day, however, they were gathered in the temple for a banquet when suddenly a column split open. The initiates inspected the column and "saw with surprise nothing revealed save this precious formula that we found there—'Nature rejoices in nature, nature triumphs over nature, nature dominates nature.' Great was our admiration for the way he had concentrated in a few words all of the writings."[95]

Zosimus's accounts of the priesthood appear to be more grounded in real-life experience. He gives many pedestrian details that suggest actual work experience in a temple environment. This is not to say that there are no traces of romanticism or legend

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[93] This story is strikingly out of character with the technical writings of Ps-Democritus's text. Scholars agree that it is probably an interpolation, possibly from the fourth century CE. See Jackson Hershbell, "Democritus and the Beginnings of Greek Alchemy," *Ambix* 34:1 (March 1987), 11.

[94] Unless otherwise noted, the quotations are from J.M. Stillman's translation, in *The Story of Alchemy and Early Chemistry*, 155-57.

[95] The last sentence of this quotation is not included by Stillman. I have adapted it from Jack Lindsay's translation, in *The Origins of Alchemy in Greco-Roman Egypt*, 103. Compare with the Greek text, *CAG* II.1.3.21-22.

in his writings, however.[96] Egyptian and Near Eastern priests are often glamorized in late ancient literature as holy men to whom the secrets of nature had been divinely revealed. Zosimus mentions several of these legendary wise men in his writings, such as Zoroaster, Hermes Trismegistus, and Democritus, the Presocratic nature philosopher from Abdera who was allegedly initiated into the alchemical mysteries by Ostanes, a famous Persian mage. As David Frankfurter has observed,

> The travelogues and fictions of the Roman period have a fascination with the Egyptian priest, romanticizing him…as the ultimate Oriental wise man. This "Egyptomania" succeeded in recasting Egypt for most Mediterranean readers (and listeners) as a landscape of gurus ready to teach and initiate Roman youths in all the esoteric mysteries and 'philosophies' they might yearn for or imagine.[97]

Zosimus, a native Egyptian, is writing for other specialists in alchemy, and many of them were probably artisan-priests. Therefore his accounts of the priesthood are probably not entirely fanciful, though they do reflect some of the popular literary styles of his time, and therefore they are most likely not entirely factual, either. Given the "Egyptomania" sweeping the Roman Empire, Zosimus would surely have benefited from his real-life association with the Egyptian priesthood and their larger-than-life reputation for wisdom in both natural and mystical matters. He and his colleagues were probably in great demand as teachers.

Alchemy and new sciences of nature

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[96] Zosimus frequently gives mythical explanations for the origins of metals and their uses, for example. In *On Electrum,* Zosimus says that Alexander the Great invented electrum, a gold-silver alloy, in order to ward off lightning, which was plaguing the Empire to the point of near-destruction. Alexander had coins made from electrum and scattered them throughout the empire, which solved the problem, and that is why people to this day wear amulets made of electrum to protect them from lightning. See *CMA* Syr. II.12.

[97] Frankfurter, *Religion in Roman Egypt*, 217-218.

Late antiquity has been characterized as an era when rational science and philosophy were in decline, usurped by the popularity of irrational "occult sciences" such as astrology, which had been gaining influence in the Greco-Roman world since the third century BCE.[98] Occult sciences are typified by an emphasis on cosmic sympathy and antipathy, whereby all parts of the universe are linked together by invisible forces; each living thing contains an immanent vital force that is naturally attracted to some forces and repelled by others. The astrological belief that the planets influence human behavior, and that certain days and times are more conducive to some activities than others, is an example of cosmic sympathy and antipathy. Alchemy and *materia medica*—a type of pharmacology based on the idea that the vital forces of plants, animal parts, metals, and so forth, have an impact on the health of humans—are also frequently listed as examples of occult sciences in this period, because of their emphasis on discovering and manipulating the hidden forces of nature. Given the negative connotations of "occult" as having to do with irrational, magical pseudo-sciences, I prefer to use an under-utilized term of Festugière's, and call these investigations of cosmic sympathies the "new sciences."[99]

As E.R. Dodds has noted, theories of cosmic sympathy were not exactly new to the Greco-Roman world, but it was during the Hellenistic era that they were first systematized and combined with elements of Greek science and philosophy.[100] Bolus of Mendes (ca. 200 BCE) is usually credited as the first to systematize and popularize the theory of cosmic sympathy. He wrote a book entitled *On Sympathies and*

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[98] On the decline of rationalism and the rise of occult sciences, see, for example, E.R. Dodds, *The Greeks and the Irrational*, 244-248; and Festugière, *La Révélation D'Hermès Trismégiste* Vol. I (entire work).
[99] Festugière refers to these sciences based on cosmic sympathy as the "new sciences" in his article "L'Hermétisme," in *Hermétisme et Mystique Païenne* (Paris: Aubier-Montaigne, 1967), 44.
[100] Dodds, *The Greeks and the Irrational*, 245-246.

Antipathies, as well as works on natural remedies, astrology, and the properties of stones, which became popular in the first century BCE.[101] Bolus was known as "the Democritean," and one ancient source explains that Bolus pretended his books were authored by Democritus, the famous atomistic philosopher (5th c. BCE).[102] By the first century CE, Democritus had achieved legendary status as a magician who learned the secrets of the cosmos from the *magoi* of the East.[103] Democritus is an important figure in early alchemical literature, and many scholars have speculated that Bolus of Mendes is the principal source of the pseudo-Democritean alchemical texts, since he began the trend of portraying Democritus as a master of the hidden properties of nature.[104]

Hermes, another alchemical author mentioned by Zosimus, is also associated with the new science. In Hellenistic Egypt, the Greek god Hermes became assimilated with the Egyptian god, Thoth, who was the god of science, knowledge, writing, and magic. The priests of the House of Life had a long tradition of attributing sacred and scientific literature to Thoth; this tradition continued in Hellenistic form with the attribution of new scientific texts to Hermes, who is sometimes portrayed as a god, and

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[101] A list of some of Bolus's works are found in the *Suda*, and cited by Hershbell, in "Democritus and the Beginnings of Greek Alchemy," 5. On the popularity of Bolus's works in the first century BCE, see Robert M. Grant, *Miracle and Natural Law in Graeco-Roman and Early Christian Thought* (Amsterdam: North Holland, 1952), 9.

[102] The ancient source is Columella, a first-century CE agricultural writer. See Hershbell, "Democritus and the Beginnings of Greek Alchemy," 6. The connection, if any, between the theories of Democritus of Abdera and those of Bolus of Mendes is obscure. They appear to have little to do with one another, but since only fragments of Democritus's writings have survived, it is difficult to determine whether or not there is a connection. Hershbell argues that the Ps-Democritean alchemical literature can be given an atomistic interpretation, but he bases this on Democritus's alleged use of the term "*physis*" to refer to atomic particles, and since *physis*, or nature, has a broad range of meaning, the connection is rather tenuous. Ibid., 13-14.

[103] See Matthew Dickie, *Magic and Magicians in the Greco-Roman World* (London: Routledge, 2001), 117-124.

[104] This connection between Bolus of Mendes and the alchemical writings of Ps-Democritus is commonplace, and has been made by Berthelot and many other well-known scholars of early alchemy. For more information, see Hershbell's article, "Democritus and the Beginnings of Greek Alchemy." However, I do not think that Bolus and the alchemical author Ps-Democritus are one and the same, since the Ps-Democritean texts are rather technical in nature.

sometimes as an ancient master. Magical and astrological Hermetica, including works dealing with astrological medicine and botany, were widely read by the first century CE.[105] Philosophical Hermetic texts, which focus on nature philosophy, cosmogony, and divine revelation, were composed between the late first and third centuries CE.[106] Zosimus is clearly influenced by the philosophical Hermetica, which synthesize elements of Greek philosophy and Egyptian religion. These texts emphasize divine revelation; in virtually all of them, the mysteries of nature and the divine are revealed by divine beings, or transmitted by legendary masters to their pupils. As Festugière has argued, both cosmic sympathy and divine revelation are integral features of the new science.[107] The mysterious forces of nature cannot be comprehended by reason alone, but must be revealed by a divine source and transmitted through initiation. This is reflected in the practice of attributing authorship of scientific works to gods and other divine beings, as well as to famous philosophers and legendary *magoi*, initiates who had received the divinely revealed wisdom.

Alchemy is very much based in the new science, but this needs to be qualified, because the scientific literature attributed to Hermes and Democritus runs the gamut from magical spells and folk remedies to more technical and philosophical works, which shows that authors with different interests and levels of sophistication were writing under the same pseudonyms. The Ps-Democritean writings on *materia medica*, for example, lean more towards the fantastic and the magical. According to Pliny, Democritus says that if one burns the head of a chameleon on logs of oak, it will cause

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[105] See Fowden, *The Egyptian Hermes*, 3.
[106] Fowden says that scholars generally agree on this span of time for the composition of the philosophical Hermetica. Ibid.,
[107] See, for example, Festugière, "L'Hermétisme," 43-44.

a rainstorm; the chameleon's right eye, when mixed with goat's milk, removes ulcers from human eyes, and its tongue has the power to influence the outcome of court cases.[108] Pliny thinks that the writings of Democritus "smack of sorcery."[109] This is also the opinion of the second-century author, Aulus Gellius, who writes, "Many fictions of this kind have been attached to the name of Democritus by ignorant men sheltering under his reputation and authority.[110]

The alchemical literature attributed to Democritus is of a very different character. It consists mainly of recipes, and his theories of cosmic sympathy are based upon practical, empirical observation. *Phūsika kai Mūstika* consists of numerous procedures for coloring metals that conclude with some version of the following slogan: "Nature rejoices in nature, nature triumphs over nature, nature dominates nature."[111] This slogan, which appears frequently in early alchemical literature, is an expression of cosmic sympathies and antipathies: the powers of one "nature" to attract, repel, or transform another. "Nature" refers to substances and to the properties that a particular substance has upon another. Ps-Democritus stresses the importance of scientific inquiry and experiment in order to properly understand the actions of various substances:

> [T]he young men are much in error, and will not put much faith in what is written, since they are ignorant of matter, not noticing that physicians, when they wish to prepare a useful drug, do not make it inconsiderately, but first test

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[108] Pliny, *NH* XXVIII.29.112-118. Cited by Lindsay, *The Origins of Alchemy in Graeco-Roman Egypt,* 114-115. Most of the works attributed to Democritus have been lost, except for numerous Ps-Democritean alchemical texts. Much of what is known about Democritean works on *materia medica* comes from Pliny.
[109] Ibid.
[110] Aulus Gellius, *Attic Nights* X.12. Cited by Lindsay, ibid., 15.
[111] See Robert Steele's translation, in *The Alchemy Reader: From Hermes Trismegistus to Isaac Newton*, ed. Stanton Linden (Cambridge: Cambridge University Press, 2003), 38-43. This slogan is also found in the astrological treatise of Nechepso-Petosiris, which survives in fragments. See J. Bidez and F. Cumont, *Les Mages Hellénisés*, Vol. I (New York: Arno Press, 1975), 245-246.

> it, whether it is a warming [substance], and how much cold, or humid or other substance necessary, joined with it will make a medium temperament….As they consider that we speak in fables and not mystically, they display no diligence in inquiring into the species of things.…If the young men had been skilled in this kind of knowledge, applying their minds judiciously to the actions of substances, they would have suffered less loss; they know not the antipathies of nature, that one species may change ten, as a drop of oil stains much purple, and a little sulphur burns many things.[112]

For Ps-Democritus and other early alchemical authors, theories of cosmic sympathy and antipathy are conceptualized in terms of the transmutation of the four elements of nature—fire, air, water, and earth—and their corresponding properties, hot, dry, wet, and cold. *The Dialogue of Cleopatra and the Philosophers*, cited at the beginning of this chapter, explicitly portrays alchemy as a science of the four elements. Cleopatra makes several analogies between the production of colored metals and the creative powers of nature. In the following passage, she asks the philosophers to observe the nature of plants, and how they are nourished by the elements:

> Look at the nature of plants, whence they come. For some come down from the mountains and grow out of the earth, and some grow up from the valleys and some come from the plains. But look how they develop, for it is at certain seasons and days that you must gather them, and you take them from the islands of the sea, and from the most lofty place. And look at the air which ministers to them and the nourishment circling around them, that they perish not nor die. Look at the divine water which gives them drink and the air that governs them after they have been given body in a single being.[113]

Cleopatra emphasizes natural patterns and rhythms. Some plants are native to the mountains, while others thrive at sea level, just as certain metals and stones are native to particular places. Plants are harvested at certain times of the year, and also on particular days, according to particular phases of the moon or positions of the stars. Many alchemists believe that metals are also subject to these natural rhythms, and that

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[112] Steele's translation, *The Alchemy Reader*, 41.
[113] Translated by F. S. Taylor, *The Alchemists*, 55.

their work should be performed in accordance with them. For example, Zosimus gives a recipe for a whitening agent made from lime that takes forty-seven days to prepare. First, the lime is corroded in strong vinegar for seven days, and then the resulting substance is exposed to the elements for forty days, where it is repeatedly dried and moistened by the sun and the dew. The natural rhythms of sun and dew are crucial to the maturation of the whitening agent, just as these rhythms are essential for the growth of plants.[114] When Zosimus speaks of "timely tinctures," the type of metal-work that does not require the use of furnaces, he could be referring to these types of methods, as well as to performing certain procedures at astrologically opportune moments.

Zosimus indicates that there is a rivalry between two alchemical schools of thought regarding the art of timely tinctures. In *On Apparatuses and Furnaces (Letter Omega)*, Zosimus is disdainful of alchemists who ignore the proper procedures for determining propitious times for the work. These rival alchemists bypass the traditional astrological formulas and instead invoke daemons for the successful outcome of their experiments. When the daemons grant them success, they ridicule the old procedures, but when they fail, they are forced to admit there may be some validity to them. Zosimus says that due to astrological influences and timing, daemons can be beneficent at one moment, and maleficent at another: this is why it is important to understand the art of proper timing, for even the behavior of daemons is subservient to it.[115]

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[114] *Mém. auth.* XIII.1, translated by M. Mertens: "Prenant donc la pierre d'albâtre, grillez un jour et une nuit: vous obtenez de la chaux. Prenez alors du vinaigre très fort et éteignez-la. C'est bien une réalisation extraordinaire que vous admirerez alors: cela blanchit parfaitement la surface. Laissez reposer et ajoutez-y du vinaigre très fort, non dans un récipient clos, mais à découvert, afin de laisser monter la vapeur qui s'en dégage a chaque fois. Prenant encore du vinaigre fort, laissez monter la vapeur pendant sept jours. Procédez ainsi jusqu'a ce que la vapeur ne monte plus, laissez quarante jours au soleil et à la rosée qui se manifeste pendant ce délai, adoucissez à l'eau de pluie et, après avoir fait sécher au soleil, vous détenez le mystère incommunicable…" (Compare with *CAG* III.2.1.)

[115] See Jackson, *Zosimos of Panopolis on the Letter Omega*, 19-21, and 42, n.11.

Some scholars claim that Zosimus is arguing against timely tinctures as a form of astrological determinism.[116] However, Zosimus does believe that the motions of the heavenly bodies have an impact on his work. In one recipe he gives instructions for extracting mercury from cinnabar at the rising of Sirius, and in another, he claims that certain operations should be performed in the summertime, because that is when the sun has a nature that is favorable to the work.[117] This disagreement over timely tinctures is not about the use of astrology, but about proper understandings of nature. For Zosimus, timely tinctures involve working in accordance with cosmic rhythms, whereas his daemon-summoning rivals attempt to subvert them. "People like this are unacceptable both to God and to men of philosophy," Zosimus says of his rivals:

> They are always following Fate, now to this opinion and then to its opposite. They have no conception of anything other than the material; all they know is Fate.
>
> In his book *On Natural Dispositions* Hermes calls such people mindless, only marchers swept along in the procession of Fate…and with no understanding of Fate herself, who conducts them justly. Instead they insult the instruction she gives through corporeal experience, and imagine nothing beyond the good fortune she grants.[118]

Fate is the force that presides over the cosmos, the realm of nature and change. In late antiquity, Fate is associated with chance and the ever-changing whims of

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[116] See, for example, J. Lindsay, *The Origins of Alchemy in Graeco-Roman Egypt*, 326-327, 337; Jean Letrouit, "Hermetism and Alchemy: Contribution to the Study of *Marcianus Graecus* 299 (=M)," in *Magia, Alchimia, Scienza dal '400 al '700: L'influsso di Ermete Trismegisto*, Vol. 1, ed. C. Gilly and C. van Heertum (Florence: Centro Di, 2002), 87, 89 (Letrouit's article is in both French and English, and as the French and English texts are printed side by side, the pagination is the same for both.); and M. Mertens, "Alchemy, Hermetism and Gnosticism at Panopolis c. 300 A.D.: The Evidence of Zosimus," in *Perspectives on Panopolis: An Egyptian Town from Alexander the Great to the Arab Conquest*, ed. A. Egberts, B.P. Muchs, and J. Van Der Vliet (Leiden: Brill, 2002), 170-171.

[117] On the preparation of cinnabar in conjunction with the rising of Sirius, see *CMA*, Syr. II.9.18. On favorable positions of the sun, see *CAG* III.15.2.

[118] Jackson's translation, *Zosimos of Panopolis On the Letter Omega*, 21.

fortune, but also with divine providence and natural law.[119] Alchemists who summon daemons in their work are under the illusion that they are manipulating cosmic forces, but in reality Fate is controlling them, for they do not comprehend that the daemons are subject to a natural order, governed by a higher divine source. Zosimus associates the unnatural methods of his rivals with magic, which he defines as using "force" upon Fate, rather than letting Fate "work in accordance with her own nature and decree."[120] "The spiritual man," he exhorts, "need not rectify anything through the use of magic."[121]

Divine revelation is an important component of the new sciences, whether it involves initiation, invoking daemons, or contemplating the divine. Zosimus thinks that the type of knowledge revealed by daemons is superficial and materialistic, enmeshed in passions and worldly concerns. In *Final Account*, Zosimus portrays the daemons as greedy, jealous beings, much like he portrays the Egyptian kings and certain priests as jealous guardians of the alchemical secrets. He writes:

> [T]he watchful daemons, once repelled by the powerful men of old, resolved to take control of the natural tinctures in our stead, so as to be no longer chased off by men, but to receive their prayers, to be invoked by them, and to be regularly nourished by their sacrifices. That is then what they did. They hid all the natural procedures, which acted through themselves, not only because they were jealous of men, but also because they were concerned with their own subsistence, so as not to be whipped, chased out, and killed with hunger through receiving no more sacrifices.
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> …They hid the natural tincture (*phūsika*) and introduced in its place their unnatural tincture (*aphūsika*), and they handed these procedures on to their priests, and, if the village-folk neglected the sacrifices, they prevented them from succeeding even in the unnatural tincture. All those [priests] then learned

[119] The association of Fate with nature and divine providence is largely due to Stoic influences. See A.A. Long, *Hellenistic Philosophy: Stoics, Epicureans, Sceptics* (Berkeley: University of California Press, 1986), 163-165.
[120] Ibid., 25
[121] Ibid.

> the so-called doctrine of the daemons of the time-fabricated waters, and, by reason of custom, law, and fear, their sacrifices multiplied.[122]

Zosimus is clearly a proponent of natural methods for making tinctures, and he claims that the unnatural methods are the invention of greedy daemons and will only work with their assent, which is gained through sacrificial offerings. Natural methods, those based on understanding and working in harmony with natural forces, require a different sort of piety, which includes appealing to a higher god and repelling the daemons through meditation. At the end of *Final Account*, Zosimus instructs Theosebia to make the daemons disappear by calming her body and her mind. He writes,

> God, who is everywhere and not confined in the smallest place like the daemons, will come to you. And, being calm in body, calm also your passions, desire and pleasure and anger and grief and the twelve portions of death [i.e., the zodiac]….In this way, taking control of yourself, you will summon the divine to you, and truly it will come, that which is everywhere and nowhere.[123]

Zosimus sometimes criticizes other alchemists for their technique, but more often he attacks their lack of morality or spiritual understanding. Technique is important, but self-control and proper piety are even more critical, and this is where he differs from his predecessors. Zosimus believes that nature is governed by divine providence, and therefore to study nature is to study the divine will manifesting in the world. The harmonization of substances in the alchemical vessel is intimately related to the balance of the soul; attunement with nature is to be attuned with God. His legacy is a spiritual approach to chemistry that persisted for nearly fifteen hundred years.

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[122] Adapted from Lindsay's translation, in *The Origins of Alchemy in Graeco-Roman Egypt*, 338.
[123] Fowden's translation, in *The Egyptian Hermes*, 122.

CHAPTER TWO:

ALCHEMY AS A SPIRITUAL PRACTICE

Historically, metallurgists and glassmakers incorporated rituals into their crafts, such as making offerings to the gods and to the spirits of deceased master craftsmen.[1] The Greco-Egyptian alchemical literature indicates that these craft rituals were still practiced in the first centuries CE. However, Zosimus criticizes such rites. He warns Theosebia not to be flattered by the local gods (he calls them "daemons") who are hungry for sacrifices as well as for her soul, and he also ridicules alchemists who invoke their personal daemons, or tutelary spirits, for success in their work.[2] Zosimus's approach to alchemy is more philosophical. His alchemical teachings emphasize ethics, investigations of nature, and contemplation of the divine, all of which are reflected in late ancient views of a philosophical way of life. As Pierre Hadot explains:

> Several testimonies show that from the beginning of the second century A.D., philosophy was conceived of as an ascending spiritual itinerary which corresponded to a hierarchy of the parts of philosophy. Ethics ensured the soul's initial purification; physics revealed that the world has a transcendent cause and thus encouraged philosophers to search for incorporeal realities; metaphysics, or theology (also called "epoptics," because, as in the Mysteries, it is the endpoint of initiation), ultimately entails the contemplation of God.[3]

While Zosimus does not appear to conceptualize these elements of philosophy in any sort of ascending order, it is evident that he does view them as interrelated components of alchemy, or the "Sacred Art" as it was called in his day.

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[1] For a cross-cultural study of these rites, see Mircea Eliade, *The Forge and the Crucible: The Origins and Structures of Alchemy*, 2nd ed. (Chicago: Chicago University Press, 1978).

[2] On "local daemons," see *Final Account*, *CAG* III.51.7.15. Festugière notes in his translation of this text that by "local daemons," Zosimus is referring to the local gods of the Egyptian nomes. See Festugière, *La Révélation d'Hermès Trismégiste* Vol. I, 229, n. 4. See also Howard Jackson, *Zosimos of Panopolis On the Letter Omega*, 19-21, for Zosimus's critique of alchemists who invoke personal daemons, and nn. 11-12 for Jackson's explanation of how these personal daemons were influenced by particular astrological configurations.

[3] Pierre Hadot, *What is Ancient Philosophy?* (Cambridge, MA: Belknap Press, 2002), 153-154.

Hadot has argued that for the ancients, philosophy was fundamentally a way of life, an "existential option which demands from the individual a total change of lifestyle, a conversion of one's entire being, and ultimately a desire to be and to live in a certain way."[4] He demonstrates that "spiritual exercises," a variety of practices aimed at modifying and transforming the self, were integral to a philosophical way of life. Zosimus is distinctive among Greco-Egyptian alchemists in that he promotes a philosophical lifestyle aimed at transformation of the self and incorporates these values into his work as a metallurgist. He recommends practicing alchemy in both a corporeal and spiritual manner, and prescribes spiritual exercises for cultivating virtue through the purification of the soul, and for facilitating the soul's ascent to the divine realms. Some of the exercises, which involve quietly examining the soul and quelling the passions, were probably not practiced in the workshop in conjunction with the treatment of metals. Nevertheless, Zosimus believes that such methods of self-examination augment his work as an alchemist. Other spiritual practices he mentions involve contemplating the metals and how they reveal the divine presence within nature as well as how they mirror human psychological states; these show how the corporeal and spiritual aspects of alchemy may have been practiced simultaneously. Whether these exercises are practiced at home or in the workshop, Zosimus considers them to be vital to his work, and this chapter will focus on the ways in which Zosimus integrates the spiritual and corporeal aspects of alchemy, and how he expresses this in literary form.

Virtue and the purification of the soul

[4] Ibid., 3.

Zosimus believes that spiritual practices make one a better alchemist, and also a more ethical alchemist. "In every art, procedures exist for the adulteration of pure things," he writes in *On Mercury* (*Letter Theta*).[5] Alchemists skilled in the coloration of metals can easily make adulterated gold pass for real gold, for example, and in this text Zosimus frequently refers to such fraudulent practices in the marketplace.[6] He also states that alchemical philosophers have corrupted the truth by speaking "of nature without knowing what nature is."[7] These philosophers not only lack wisdom, but many also lack virtue, for they falsify or omit pertinent information out of greed, spite, and jealousy. "Numerous are the adversaries (of truth) and the inventors of falsified species, who make appearances of the truth," he writes.[8] Hence, it is necessary to examine things both corporeally and spiritually, so that one can more accurately assess the purity of products and the quality of alchemical instruction one receives from books and from teachers. Meditation is the key to practicing alchemy in a spiritual manner, for this purifies the soul of its passions and helps one to clearly understand nature. As Zosimus writes in *On Iron* (*Letter Kappa*),

> If you are impure, you won't work well, you won't understand…. Know that you will be tested for the spiritual and corporeal things, until you arrive at perfection, in acquiring patience with purity and love (of the art); then you will

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[5] *CMA*, Syr. II.9.28: "Ainsi, dans tous les arts, il existe des procédés pour falsifier les choses pures."
[6] For example, he says that there are tests for determining the quality or purity of various products, and that craftsmen know how to use them when they buy, but when they sell, they swear that they don't know the means for testing these products. See *CMA*, Syr. II.9.29: "Il y a beaucoup d'épreuves pour celui-ci et pour toute chose. Tous les artisans savent les employer quand ils achètent; mais quand ils vendent ils jurent sur leur tête qu'ils ne connaissent pas le moyen de les éprouver."
[7] *CMA*, Syr. II.9.28: "Les vrais philosophes comptent aussi à côté d'eux des corrupteurs, surtout parmi ceux qui ont parlé de la nature, sans savoir ce que c'est que la nature, ni où elle prend son principe, ni même que la nature est simple et composée."
[8] Ibid.: "Pour les choses dont nous traitons exactement dans le livre divin, veille à ne rien faire sans l'éprouver corporellement et spirituellement. Car nombreux sont les adversaires (de la vérité) et les inventeurs des espèces falsifiées, qui prennent les apparences de la vérité. Les vrais sages sont vite reconnus, s'ils sont examinés corporellement et spirituellement."

> find (the object of your desire), in abandoning the corporeal arts. Therefore don't stop meditating and working, and you will understand.[9]

In *Final Account*, Zosimus recommends a meditative exercise to Theosebia that involves sitting quietly at home and calming the activities of the body and the passions of the soul, such as desire, pleasure, anger, and grief.[10] He says that through this exercise, the daemons will be repelled and the omnipresent divine will appear.[11] Divesting the soul of its passions is an exercise in self-awareness and self-mastery, one that cultivates virtue by making a person more aware of his or her impulses and how to control them. The goal of this exercise is to reach the passionless state of *apatheia*, where the higher, rational soul is free from material attachments and unmoved by the distracting impulses of the lower, irrational parts of the soul. In this state one can more fully experience divine presence.

As Hadot observes, "[t]he movement of concentration upon and attention to oneself turns out to be closely related to the opposite movement of dilation and expansion by which the "I" finds its place within the perspective of the All."[12] In ancient philosophy, the purification of the soul is associated with the soul's ascent to the noetic realms beyond the cosmos; mastery of the self involves rising above one's own nature, rising above worldly concerns, and ultimately transcending nature altogether. In Plato's *Phaedrus*, for example, the purification of the soul is associated with the ascent of the soul through the heavens. The rational soul is described as a

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[9] *CMA*, Syr. II.11.21: "Mais si tu es impur, tu ne travailleras pas bien, tu ne comprendras pas, et tu n'entendras pas les autres (philosophes)…. Sache que tu seras éprouvé pour les choses spirituelles et corporelles, jusqu'à ce que tu parviennes à la perfection, en acquérant la patience avec la pureté et l'amour (de l'art); alors tu trouveras (l'objet de ton désir), en délaissant les arts corporels. Ne cesse donc pas de méditer et de travailler, et tu comprendras."

[10] See G. Fowden's translation of this passage in *The Egyptian Hermes*, 122.

[11] Ibid. Compare with the practices of early Christian desert ascetics, who through their meditations struggled to overcome the daemons of sexual desire, hunger, and so forth.

[12] Hadot, *What is Ancient Philosophy?*, 202.

charioteer, whose mastery of the two horses, or the passions and appetites of the soul, enables the soul to journey to the realm of the fixed stars, where the gods reveal the divine reality beyond the cosmos.[13] As the soul ascends, it apprehends the divine more clearly, and this higher, holier vantage point brings new wisdom about the self and the world. According to Zosimus, alchemists who neglect the spiritual aspects of the Sacred Art lack virtue and have inadequate views of nature because they have not experienced the divine revelations that bring deep understanding of these things. Divesting the soul of its passions helps them to attain such revelations.

Contemplating nature as a spiritual exercise

Many ancient philosophers devoted time to investigating the workings of nature. As Hadot argues, their research often had a spiritual dimension: physics was seen as a spiritual exercise. Citing passages from well-known thinkers from the major philosophical schools of the Greco-Roman period—Platonists, Aristotelians, Stoics, and Epicureans—Hadot demonstrates that across the board, philosophers believed that contemplation of nature elevates the spirit and enables the philosopher to plunge "into the totality of the world" and become "aware of his being within the All."[14] This is true of non-scientists as well. For example, the second-century Stoic and emperor, Marcus Aurelius, portrays the contemplation of nature as a spiritual exercise: "Survey the circling stars, as though yourself were in mid-course with them. Often picture the changing and re-changing dance of the elements. Visions of this kind purge away the dross of our earth-bound life."[15] Hadot explains that physics as a spiritual exercise can

[13] See Plato, *Phaedrus* 246b-247e.
[14] Hadot, *What is Ancient Philosophy?*, 204, 205.
[15] Marcus Aurelius, *Meditations* 7.47 (trans. Maxwell Staniforth).

lead to a type of mystical experience, where the soul expands "into the immense field of infinite space" and seizes "the whole of reality in a single intuition."[16]

Zosimus clearly views metallurgy as a spiritual exercise, though he may not have practiced his work in a spiritual manner in every instance. However, even in his more mundane recipes, he frequently expresses awe at the chemical reactions he observes, and refers to these as "incommunicable mysteries."[17] In the following passage, he reflects upon the properties of mercury and explains how this metal is an expression of the divine within nature:

> This is the divine and great mystery, the object of research, because this is the All. Two natures, (but) only one substance, because one attracts the other and one dominates the other. This is the silvery water, the hermaphrodite, which constantly flees, which hurries toward the proper realities; it is the divine water that all have ignored, whose nature is difficult to conceive. Indeed, it is not a metal, nor a water always in movement, nor a body (solid), because one cannot seize it. It is the universal in all things, because it at once possesses life and spirit, as well as a destructive power. The one who understands it possesses both gold and silver.[18]

The "new sciences" of the Greco-Roman period, which focus on cosmic sympathies and divine revelation, are based upon a belief that the macrocosm is related to—and reflected in—the microcosm. In the passage cited above, Zosimus describes

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[16] Hadot, *What is Ancient Philosophy?*, 205.

[17] See, for example, *On Lime* (*Mém. auth.* XIII.1, cited in Ch.1, n. 114), where Zosimus describes the formation of a whitening agent as an "incommunicable mystery." He further expounds that this whitening agent is "the stone that is not a stone, the one that is unknowable and known by all, the one that is unworthy of honor and very honored, the one that is not a gift while being a divine gift." (Mertens's translation: "Car cet élément capital, ils l'appelèrent dans leurs écrits obliques la pierre qui n'est pas une pierre, celle qui est inconnaissable et connue de tous, celle qui est indigne d'honneur et très honorée, celle qui n'est pas un cadeau tout en étant un cadeau divin.")

[18] *Mém. auth.* V: "C'est cela le divin et grand mystère, l'objet de la recherche; car c'est cela l'Universel [*to pan* in Greek, or "the All." See the Greek text in Mertens]. Deux natures, (mais) une seule substance; car l'une attire l'autre et l'une domine l'autre. C'est cela l'eau argentée, l'hermaphrodite, ce qui fuit sans cesse, ce qui se presse vers les réalités propres, l'eau divine, que tous ont ignorée, dont la nature est difficile à concevoir. En effet, elle n'est ni un métal, ni une eau toujours en mouvement, ni un corps (solide), car on ne peut la saisir. C'est cela l'Universel en toutes choses; car elle possède a la fois vie et esprit, et elle a un pouvoir destructeur. Celui qui la comprend possède et l'or et l'argent. Sa vertu reste cachée mais elle est dédiée à Érôtylos."

how the properties of mercury reflect the "universal in all things." This is an example of how he sees the whole of reality reflected in a particular substance, and also how he views the metals as *sunthēmata* ("signs"), or signatures, of the divine, which reveal the divine presence in the world. *Sunthēmata* can be understood as visible properties of certain objects that reveal hidden sympathies to other objects and to the divine power that unites them as an interconnected whole.[19] The tracing of cosmic sympathies by means of *sunthēmata* was an integral feature of Greco-Roman sciences. For example, Zosimus recommends that mercury should be extracted from cinnabar at the rising of Sirius.[20] The rising of Sirius marks the Egyptian New Year, which coincides with the annual flooding of the Nile.[21] Mercury, which is a fluid, silvery substance, is a *sunthēma* of the river, and both mercury and the Nile bear the divine signature of the star Sirius.[22] *Sunthēmata* were also employed in various ritual practices of that era, from "magical" rites to philosophical meditations. Neoplatonic theurgists, for instance, used *sunthēmata* in their meditative rituals. Iamblichus, a contemporary of Zosimus who wrote a book on theurgy, says: "All of theurgy has a two-fold character. One is that it is a rite conducted by men which preserves our natural order in the universe; the other is that it is empowered by divine symbols (*sunthēmata*), is raised up through them to be joined on high with the Gods."[23] Proclus, writing in the fifth century, explains that the heliotrope, lion, cock, and bel stone are all divine signatures of Helios, the sun

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[19] In Michel Foucault's discussion of pre-modern understandings of the universe as an "interplay of resemblances," he describes the role of signatures as visible signs of invisible similitudes. See Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage Books, 1994), 26.
[20] See *CMA* Syr. II.9.15, 18.
[21] See R.T. Rundle Clark, *Myth and Symbol in Ancient Egypt* (London: Thames and Hudson, 1978), 188.
[22] Sirius is the Egyptian goddess Sothis, later identified with Isis. See Rundle Clark, ibid. Zosimus has a more monotheistic view of the divine, and believes that an even higher power rules over these "local" gods.
[23] *De mysteriis* IV.2.184. Translated by Gregory Shaw, in *Theurgy and the Soul: The Neoplatonism of Iamblichus* (University Park, PA: The Pennsylvania State University Press, 1995), 51.

god, because they imitate the qualities of the sun in some way. By meditating upon these material *sunthēmata*, one can gain access to the immaterial divine presence within these objects—in this case, Helios.[24] Zosimus contemplates the metals in a similar fashion.

In *On Electrum*, Zosimus shows Theosebia that by contemplating electrum as a divine signature, one can travel a path of symbolic correspondences that leads through the cosmos and culminates in a vision of the divine mind. He begins with a story of how electrum, an alloy of gold and silver, was invented by Alexander the Great as a means of warding off thunderbolts that were plaguing the Empire. In alchemical literature, electrum corresponds to the planet Jupiter; Zosimus alludes to this by associating electrum with Zeus (Jupiter), god of the thunderbolt. He explains that people still wear talismans of electrum to ward off lightning, and that mirrors made of electrum are believed to ward off all pains. When one gazes into the electrum mirror, it gives him "the idea to examine and purify himself, from his head to the tips of his nails."[25] Zosimus then takes the symbolism of the mirror to a deeper level. The purpose of the mirror is not "for a man to contemplate himself materially," he says, but rather this should be understood as a symbol of spiritual contemplation:[26]

> The mirror represents the divine mind; when the soul looks at itself, it sees the shameful things that are in it, and it rejects them; it makes its stains disappear and remains without blame. When it is purified, it imitates and takes for its model the Holy Spirit; it becomes spirit; it possesses calmness and constantly turns to this superior state, where one knows (God) and where one is known. Becoming then without stain, it gets rid of its inherent ties and those that it has in common with the body, and it (rises) toward the All-powerful. Indeed, what

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[24] Proclus gives indications of the ritual use of *sunthēmata* in his treatise, *On the Hieratic Art of the Greeks*. His examples of the *sunthēmata* of the sun are cited by Shaw in *Theurgy and the Soul*, 48-49.
[25] *CMA,* Syr. II.12.3: "Ce miroir, lorsqu'un homme s'y regarde, lui suggère l'idée de s'examiner lui-même et de se purifier, depuis la tête jusqu'au bout des ongles."
[26] Ibid.: "Le miroir n'était pas disposé dans ce but, qu'un homme s'y contemplât matériellement…."

> is the philosophical saying? "Know thyself." This is indicated by the spiritual and intellectual mirror. What then is this mirror, other than the divine and primordial mind?[27]

Ultimately, one has to make the ascent through the cosmos in order to gaze into the mirror of the divine mind, because this mirror is located above the cosmos, where it serves as a mirror reflecting the divine presence within the universe:

> This mirror is positioned above the Seven Doors [planets], on the side of the west, so that the one who watches there sees the east, where the intellectual light shines, which is above the veil. That is why it is also placed next to the south, above all the doors that answer to the Seven Heavens, above this visible world, above the Twelve Houses [of the zodiac] and the Pleiades, which are the world of the thirteen. Above them exists this Eye of the invisible senses, this Eye of the mind, which is present there and in all places. One who sees this perfect mind, in the power of which all is to be found, will be held in hand and kept from death. We have reported this, because we have been driven there while speaking of the mirror of electrum, that is to say the mirror of the mind.[28]

In this meditation on electrum, Zosimus leads the reader from a mythical story of the metal's origins, to a discussion of how talismans and mirrors made of electrum are commonly thought to ward off disaster and pain, to a philosophical interpretation of the mirror as a means to "know thyself," and finally, to the noetic realm of the divine mind. These correspondences form a ladder of ascent from the material to the spiritual worlds. For Zosimus, to deeply contemplate the nature of metals is to contemplate the

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[27] Ibid.: "Le miroir représente l'esprit divin; lorsque l'âme s'y regarde, elle voit les hontes qui sont en elle, et elle les rejette; elle fait disparaître ses taches et demeure sans blâme. Lorsqu'elle est purifiée, elle imite et prend pour modèle l'Esprit-Saint; elle devient elle-même esprit; elle possède le calme et se reporte sans cesse à cet état supérieur, où l'on connaît (Dieu) et où l'on en est connu. Alors devenue sans tache (sas ombre), elle se débarrasse de ses liens propres et de ceux qui lui sont communs avec son corps, et elle (s'élève) vers l'Omnipotent. Que dit en effet la parole Philosophique? Connais-toi toi-même. Elle indique par là le miroir spirituel et intellectuel. Qu'est donc ce miroir, sinon l'esprit divin et primordial (du Père?)."

[28] *CMA,* Syr. II.12.3: "Ce miroir est placé au-dessus des Sept portes, du côté de l'Occident, de telle sorte que celui qui y regarde voit l'Orient, là où brille la lumière intellectuelle, qui est au-dessus du voile. C'est pourquoi il est placé aussi du côté [S]ud, au-dessus de toutes les portes qui répondent aux Sept cieux, au-dessus de ce monde visible, au-dessus des Douze maisons et des Pléiades, qui sont le monde des treize. Au-dessus d'eux existe cet Œil des sens invisibles, cet Œil de l'esprit, qui est présent là et en tous lieux. On y voit cet esprit parfait, en la puissance duquel tout se trouve, dès main-tenant et jusqu'à la mort. Nous avons rapporte ceci, parce que nous y avons ete conduits en parlant du miroir d'electrum, c'est-a-dire du miroir de l'esprit."

divine mysteries that nature holds. Electrum is not only a substance used in making mirrors, it is a substance that reflects the divine presence in all things.

Zosimus also views letters of the alphabet as divine signatures that can reveal the cosmic mysteries.[29] In *Apparatuses and Furnaces* (*Letter Omega*), he explains that the letter omega has a material and an immaterial significance:

> Round Omega is the bipartite letter, the one that in terms of material language belongs to the seventh planetary zone, that of Kronos. For in terms of the immaterial it is something else altogether, something inexplicable, which only Nikotheos the hidden knows. In material terms Omega is what he calls "Ocean…the birth and seed of all gods."[30]

In this same work, Zosimus discusses the mystical significance of the Hebrew name Adam:

> So, then, the first man among us is named Thouth, and among them Adam….[T]he name they refer to him by is symbolic, composed of four elements from the whole sphere. For the letter A of his name signifies the *ascendant* east, and *air*; the letter D…signifies the *descendant* west, and earth, which sinks *down* because of its weight; …; and the letter M…signifies the *meridian* south, and the ripening fire in the *midst* of these bodies, the fire belonging to the *middle*, fourth planetary zone.[31]

The alliteration of the first letters of these words and their associations (e.g., alpha/ascendant/air) is probably a mnemonic aid for contemplating the various correspondences. Adam is the cosmic man, and the letters of his name connect the human to the four elements and the four cardinal points of the zodiac. The letter M

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[29] *Sunthēmata* do not have to be material "stuff" in the strict sense of the word. Divine names, music, images, and numbers could all be divine signatures. See Shaw's discussions of various kinds of *sunthēmata* in the second half of *Theurgy and the Soul*.

[30] Jackson's translation, *Zosimos of Panopolis On the Letter Omega*, 29. Nikotheos is a famous "gnostic," mentioned by Porphyry in his *Life of Plotinus*. *Letter Omega* is one of the surviving books of Zosimus's alleged twenty-eight volume encyclopedia of alchemy, in which each of the books was superscribed with a letter of the Greek alphabet. The other surviving portions of this work, which are found in the Syriac manuscripts, do not contain any meditations on the meaning of the letters.

[31] There is a lacuna in the text, and the interpretation of the second letter A is missing. This second A would be *arktos*, the northern point of the zodiac, which is associated with water. This association of the letters of Adam with the four cardinal points of the zodiac is also found in the third book of the *Sybilline Oracles* (1st c. CE). See Mertens, *Zosime de Panopolis: Memoires Authentiques*, 91-93, n. 59.

corresponds to the realm of the sun, the fire "in the midst of these bodies." Zosimus explains that Adam is the name of the flesh, the "visible outer mould," but that the "Man within him, the Man of spirit, has a proper name as well as a common one."[32] Like the letter omega, this secret name is known only to the initiates who perceive the immaterial reality within the divine signatures. Zosimus says that the common name of the spiritual Adam is *Phōs*, or light; therefore the solar fire "ripening" in the midst of the cosmos is like the light of spirit ripening within the human being. In Stoic and Hermetic literature, the divine is described as an ethereal, fiery substance that permeates all things, so this fire "in the midst of these bodies" is also the divine fire. By meditating upon these *sunthēmata*, Zosimus makes connections between the human, the cosmos, and the divine, and in doing so, he experiences the divine power that is immanent in the world.[33]

This spiritual exercise of contemplating the metals and their symbolic correspondences appears to be Zosimus's *modus operandi* for practicing alchemy in a spiritual and corporeal manner simultaneously. Observing the properties of metals and chemical reactions provides the alchemist with ample opportunity to reflect upon nature and the divine, and thereby elevate the human spirit.

Alchemy and sacrifice

In Zosimus's allegory of the alchemical opus, *On Excellence*, alchemy is portrayed as a kind of sacrificial rite.[34] Sacrifice is the predominant theme in this work,

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[32] Jackson's translation, 29.
[33] See also Patricia Cox Miller, "In Praise of Nonsense," in *Classical Mediterranean Spirituality*, ed. A.H. Armstrong (New York: Crossroad, 1986), 496.
[34] This text is Zosimus's most famous work, and it is perhaps best known as "The Visions of Zosimos," the title given to it by F.S. Taylor (see his "Translation of 'The Visions of Zosimos,'" *Ambix* 1, 1937-38:

but what Zosimus means by "sacrifice" requires some explanation.

Ritual sacrifices were under scrutiny in Zosimus's day. For centuries, Greek writers had ridiculed these practices for various reasons, but their criticisms never attained widespread appeal. In the Greco-Roman period, it was becoming more common to reject ancient traditions of animal sacrifice and reinterpret these ritual offerings to the divine in new ways. This cultural phenomenon transcended religious orientations, and was probably fueled by Jewish and Christian ideas. For example, it was customary for Jews to offer sacrifices at the Temple in Jerusalem, but with the destruction of the Second Temple in 70 CE, sacrificial rites could no longer be performed.[35] Doing good works and obeying the Torah began to replace ritual sacrifice as a means of atoning for one's sins and uniting with God.[36] Early Christians rejected Temple traditions of animal sacrifice because they viewed these practices, along with circumcision and other ritual observances, as adhering to the "letter" rather than the "spirit" of the law. Christ's death was considered to be the fulfillment of sacrificial laws; Jesus offered himself as the ultimate sacrifice, and therefore temple sacrifices were no longer required.[37]

The Neoplatonist philosopher Porphyry (ca. 233-304 CE) rejected the practice of animal sacrifice, as did several Greek philosophers before him, on the grounds that it

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88-92). The Greek title, *Peri aretē,* has been translated in a few different ways. Berthelot and Ruelle translate it as "virtue" [see *CAG* III.1]; C.G. Jung prefers "art" [see Jung, *Alchemical Studies* (Princeton: Princeton University Press, 1967), 59]. I prefer to follow Mertens's translation of *aretē* as "excellence," for it captures both the moral and technical excellence that Zosimus emphasizes in his writings (see *Mém. auth.* X).

[35] Sacrifices could only be performed in the Temple at Jerusalem, so after the destruction of the first Temple in 587 BCE, Jews living in exile began to reinterpret sacrificial laws. See Robert J. Daly, "The Power of Sacrifice in Ancient Judaism and Christianity," *Journal of Ritual Studies* 4, no. 2 (1990): 188-189.

[36] Ibid.

[37] See, for example, Hebrews 9. Early Christian views of sacrifice were institutionalized in the ritual of the Eucharist. On the institutional and spiritual interpretations of sacrifice in both Judaism and early Christianity, see Daly's article cited above.

is morally wrong to kill animate creatures.[38] In his treatise *On Abstinence*, Porphyry delivers a series of arguments against animal sacrifice along with thoughts on how one should substitute for this practice. He condones offerings of non-animate materials, such as grains and honey, to the local gods, but "to the god who rules over all," he says, "we shall offer nothing perceived by the senses, either by burning or in words."[39] Sacrifices should reflect the gifts given by the gods, so therefore it is appropriate for farmers to offer the first fruits of their harvests, but philosophers should offer their thoughts.[40] Porphyry says that philosophical sacrifice is "fulfilled in dispassion of the soul and contemplation of the god."[41] Similar concepts are found in Hermetic literature, where thanksgivings and hymns of praise, as well as silent contemplation, are portrayed as sacrificial offerings to the divine.[42] Along with silent contemplation, Porphyry says that the objects of one's thoughts also make for a proper sacrifice. He claims that Pythagoreans offer numbers and geometrical figures to the gods, and the gods are so pleased by this that in return, they offer their divine help with anything that needs to be investigated.[43]

Zosimus, who is influenced by Hermetism and has also read works by Porphyry, appears to have adopted these philosophical notions of sacrifice.[44] In his

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[38] Pythagoras, Empedocles, and Theophrastus are all cited by Porphyry. These philosophers also advocated vegetarianism for the same moral reason. Porphyry doesn't cite his teacher, Plotinus, as an example, though in his biography of Plotinus, he mentions that Plotinus was a vegetarian and refused to take medicines made from animal products. He probably objected to animal sacrifice as well. See Gillian Clark's discussion in her introduction to Porphyry's *On Abstinence from Killing Animals* (Ithaca: Cornell University Press, 2000), 7-11.
[39] *On Abstinence,* 2.34.
[40] Ibid.
[41] Ibid.
[42] See *Corpus Hermeticum* I.31and XIII.17-21 (trans. Brian Copenhaver). See also Fowden's discussion of Hermetic notions of intellectual sacrifice in *The Egyptian Hermes*, 147-148.
[43] *On Abstinence*, 2.36
[44] Zosimus refers to Porphyry in *CAG* III.32, though here he discusses Porphyry's views on substances, not on sacrifice.

allegory, the metals are offered as sacrifices. Though he may have viewed the firing of metals as a type of sacrificial ritual, I am wary of taking the sacrifice of metals too literally, since the only place Zosimus mentions this practice is in this allegory, and allegories are not meant to be taken literally. I think that by "sacrifice," Zosimus most likely means meditation, the offering of one's thoughts to God, as well as one's research, in the same way that Porphyry describes the Pythagoreans offering up their numbers to the divine. This interpretation of sacrifice as meditation is consistent with the emphasis Zosimus places on contemplative practices—especially the contemplation of metals as *sunthēmata*, or divine signatures—as well as his disdain for ritualistic sacrifices offered to daemons, or the local gods.

On Excellence is divided into three lessons, and the entire work is styled as a series of dreams, five in all.[45] The dreams are full of exceedingly violent and grotesque imagery, and give the overall impression that the alchemist is trapped in a nightmare from which he cannot escape. Upon awakening after each of the terrifying dreams, the alchemist either understands some aspect of the chemical operations taking place, or arrives at a deeper understanding of nature. The dreams clearly reflect the "violence" done to the metals as they are fired and treated with corrosive substances. The torture and suffering of the metals in Hades has precedents in Greco-Egyptian alchemical literature, but Zosimus amplifies the violent imagery to a much greater degree. However, when the symbols in this allegory are decoded, it becomes apparent that Zosimus is describing a spiritual ascent through the cosmos, and is comparing the purification of metals with the purification of the soul.

[45] The lessons are titled *praxis a*, *b,* and *g* (alpha, beta, gamma), but I will refer to them here as Lessons One, Two, and Three.

In my reading of *On Excellence*, I will be paying close attention to the pervasive theme of sacrifice in this text, for it encapsulates the violent sacrifice of the metals as well as the meditative practice of the alchemist and therefore sheds light on how the transformation of the metals and the alchemist are intertwined in the Sacred Art. I will also be focusing on how alchemical terminology mirrors the language of spiritual ascent, and how Zosimus uses this to forge an identity between the two processes of transformation. Since the metals are personified in this allegory and often transform into one another, and are even identified with the alchemist in some cases, I will refer to the dreaming alchemist as "Zosimus" for the sake of clarity.

On Excellence: Lesson One

In the opening lines of Lesson One, Zosimus states his alchemical premises for the reader:

> The composition of waters, the movement, growth, removal, and restitution of corporeal nature, the separation of the spirit from the body, and the fixation of the spirit on the body are not due to foreign natures, but to one single nature reacting on itself, a single species, such as the hard bodies of metals and the moist juices of plants.
>
> And in this system, single and of many colors, is comprised a research, multiple and varied, subordinated to lunar influences and to the measure of time, which rule the end and the increase according to which the nature transforms itself.[46]

The language of "spirits" and "bodies" refers to the separation of volatile substances (spirits) from their metallic bodies, probably by means of distillation, and to fixing colors—also known as "spirits"—upon a substance. Zosimus insists that these processes are not accomplished by foreign natures, such as daemons, but are accomplished by one nature acting upon itself, by which he means the fundamental

[46] F.S. Taylor's translation, *The Alchemists*, 57.

nature, or primal matter, that manifests as the four elements.[47] This opening statement can be seen as an affirmation of Zosimus's "natural" methodology for creating timely tinctures. In other treatises he says that those who use "unnatural" methods ignore the procedures of astrological timing—which he promotes here—and believe that daemons can influence chemical operations.[48] Since the spirits of metals are personified in this allegory and can be easily confused with daemons, Zosimus's declaration of his methodological orientation helps to prevent such interpretive errors.

At this point, Zosimus enters into a dream and sees a "sacrificing priest" presiding over an altar shaped like a phial (*phialē*), which is a technical term for the dome-shaped covers of various distillatory apparatuses, including the *kērotakis*.[49] He tells Zosimus that he had been sacrificed earlier that morning and has survived an "intolerable violence":

> For one came headlong in the morning, dismembering me with a sword, and tearing me asunder according to the rigor of harmony. And flaying my head with the sword which he held fast, he mingled my bones with my flesh and burned them in the fire of the treatment, until I learned by the transformation of the body to become a spirit.[50]

As the priest speaks these words, his eyes fill with blood and he begins gnawing off his skin and vomiting up his own flesh. Zosimus awakens from this terrifying vision and

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[47] Plato was the first to argue that the four elements are not separate units, as Empedocles had proposed, because they easily change into one another; rather, they are four primary qualities of a single, fundamental nature (or primal matter). Aristotle shared this view. See A.J. Hopkins, *Alchemy: Child of Greek Philosophy*, 17-18, 22; and Plato, *Timaeus* 49-50.

[48] See my previous discussion of this in Ch.1, pp. 29-32.

[49] Taylor translates this as a "bowl-shaped altar," but Mertens preserves the technical term in her translation. See *Mém.auth.* X, n. 6. In her footnote, Mertens identifies the phial solely with the *kērotakis*, which is probably the device represented in this allegory, though in ancient alchemical illustrations, the covers or lids of several apparatuses are labeled as "*phialē*." See the illustrations in Berthelot, *CAG*, Vol. I, ch. 5, and in the introduction and appendix of Mertens, *Zosime de Panopolis: Mémoires authentiques.*

[50] Taylor, 57.

says, "Is this not the situation of the waters?"[51] The waters are later identified as white and yellow sulfurous (or divine) waters.[52] The Greek word for sulfur, *theion*, also means "divine being."

He falls asleep again and dreams he is at the phial-shaped altar, where an endless number of people are submerged in boiling waters, wailing in pain. A little barber, or "razor-working man" (*xūrourgon anthrōparion*), appears and explains to Zosimus that the spectacle that he is witnessing "is the entrance, the exit, and the transformation."[53] He continues: "This is the place of the operation called embalming [*taricheia*]. Those who wish to attain excellence enter here and become spirits, fleeing from the body."[54] Zosimus asks him if he is a spirit, and the barber replies that he is "a spirit and a guardian of spirits."[55] Then a copper man appears with a lead writing tablet in his hand, and counsels the people "under punishment" in the boiling waters "to calm themselves," and to "keep their eyes upward and their mouths open until their grapes are grown."[56] Zosimus realizes that the copper man and the sacrificing priest are one and the same.

When Zosimus awakens from this second dream—the last in Lesson One—he understands cosmic unity, among other things. Before I address these revelations, it

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[51] Ibid.
[52] He identifies the white and yellow waters at the end of the second dream of Lesson 1.
[53] Taylor omits the barber's statement about the entrance, exit, and transformation, but it is present in the French translations by Berthelot and Mertens. See Mertens, *Mém. auth.* X.3: "'Ce spectacle que vous voyez, c'est l'entrée, la sortie et la transformation.'"
[54] Adapted from Taylor's translation, 58. He translates the word *taricheia* as both preserving and embalming. Compare with Liddell and Scott's *Greek-English Lexicon*, where *taricheia* refers to embalming as well as to methods of preserving food, such as pickling, salting, or smoking. Berthelot and Mertens translate this term as "*macération*," which in French means steeping or soaking, as well as mortification. Their translation fits well with the imagery in the text, but I think that Zosimus's intent is to evoke the imagery of embalming practices, which I will be discussing shortly.
[55] Taylor, 58
[56] Adapted from Taylor's translation, 58. Mertens notes that "grapes" are probably protuberances that emerge on the surface of the metal as it is being treated. See *Zosime de Panoplis: Memoires Authentiques*, 221, n. 26.

will be helpful to examine the technical and religious significance of the dream imagery thus far.

The technical procedure alluded to in this allegory is for coloring a copper-lead alloy, probably using a *kērotakis*. At the end of this lesson, Zosmius writes: "[T]he priest, the man of copper, whom you see seated in the spring and gathering his color, do not regard him as a man of copper; for he has changed the color of his nature and become a man of silver. If you wish, after a little time, you will have him as a man of gold."[57] Zosimus appears to be alluding to the *kērotakis* procedure for coloring alloys gold. This process effects a sequence of color transmutations—blackening, whitening, yellowing, and sometimes reddening—which agrees with Zosimus's statement that the copper-lead alloy is first colored silver (whitened), then gold (yellowed). In Lesson Two the barber is clothed in a red robe, which could indicate the reddening stage. According to A.J. Hopkins, the initial stage of the *kērotakis* process involves roasting a copper-lead alloy with sulfur. The sulfur vaporizes and "attacks" the metal, corroding it until it becomes a blackened, cinder-like mass.[58] The blackened alloy is then purified by removing the excess sulfur with an agent known as "sulfur water," which is a solution of sulfur and lime powders dissolved in vinegar.[59] The whitening and yellowing of the alloy is then accomplished by treating it with various other ingredients, including mercury, or silver and gold leaf dissolved in an arsenic

[57] Taylor, 59.
[58] A.J. Hopkins, "A Study of the Kerotakis Process as Given by Zosimus and Later Alchemical Writers," 329-332.
[59] Ibid., 335-336. Sulfur is yellow, and lime is white. Though Hopkins relates that when the mixture of these powders is dissolved in vinegar, the resulting solution has a blood-red color.

solution.[60] The white and yellow waters mentioned by Zosimus could refer to the "sulfur water," or to the silver and gold arsenic solutions, or both.

The priest is identified as a sacrificing priest, although Zosimus does not show him performing sacrifices, but rather as the one who is being sacrificed. He is the metal alloy sacrificed in the alchemical vessel, but he also represents the alchemist, since many alchemists were artisan-priests. One of the insights that Zosimus receives from these dreams is that the sacrificer and the sacrificed are the same. The alchemist-priest is performing a philosophical sacrifice, the offering of one's own thoughts and research to the divine. He identifies with the metals being transformed in the alchemical vessel, which mirrors his own spiritual transformation that occurs by purifying the soul and contemplating the divine. The priest, as a copper man, tells the humans seated in the boiling waters to calm themselves, just as Zosimus recommends to Theosebia that she should calm her body and mind in order to transcend the agitations of the passions. Thus the transformation of the base metals into a gold-colored alloy is likened to the transformation of the baser aspects of one's nature into spiritual "gold." Gold, which is incorruptible in the sense that it does not tarnish or rust, was widely regarded in antiquity as a symbol of perfection and of the divine.[61]

The barber, or razor-working man, provides additional clues as to the spiritual transformations taking place.[62] In Zosimus's day barbers performed bloodletting surgeries, which were thought to release impurities from the blood and restore the

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[60] Ibid., 336-338.
[61] See Dominic Janes's excellent study of the religious symbolism of gold in this period, in *God and Gold in Late Antiquity* (Cambridge: Cambridge University Press, 1998).
[62] Zosimus does not use any of the standard Greek terms for barber, but refers to him as *xūrourgos*, or a "razor-working" man—a term which he seems to have coined. There are many *hapax legomena* and rare words in Zosimus's writings. See Mertens's discussion and a list of these words, in *Zosime de Panopolis: Mémoires Authentiques*, 271-273.

humors to a healthy, balanced state.[63] The metals in this text are described as being drained of blood, or being filled with blood, so blood is probably synonymous with the "spirit" of the metals, either in the sense of the liquefaction of the solid bodies as they begin to melt and vaporize, or in the sense of a color being imparted to a metallic body. Hermetists and Neoplatonists envisioned the human spirit as a kind of subtle body or ethereal envelope that serves as a vehicle for the soul as it travels through the cosmos, and this spirit was connected to the body via the bloodstream.[64] The barber-as-bloodletter thus represents the release of the spirit (blood) from the body, as well as healing the soul by ridding it of its material impurities.[65]

The barber also mentions that the alchemical operation taking place is called "embalming," which links alchemy with Egyptian chemical and religious procedures for preserving corpses, which enabled the souls (or subtle bodies, the *ka* and *ba*) of the deceased to journey to the spirit world and return to the body for nourishment. When a body is embalmed, all of the vital organs are removed, the bodily fluids are drained, and the corpse is placed in natrum (a kind of salt), which dries it out and preserves it; it is then wrapped tightly in linen so that it will remain intact.[66] Embalming rituals involved a ceremony called the "opening of the mouth," in which a priest spiritually animates the corpse and opens its eyes and mouth so that it will be serviceable to the

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[63] See Peter Brain, *Galen on Bloodletting* (Cambridge: Cambridge University Press, 1986), 6-14.
[64] On the history of the Neoplatonic concept of the soul-vehicle, see E.R. Dodds, *Proclus: The Elements of Theology* (Oxford: Oxford University Press, 1963), Appendix II. See also *Corpus Hermeticum* X.13-18, which describes the spirit as being united to the body via the bloodstream, where it "governs" and "moves" the human being.
[65] Compare with the following passage from a Hermetic text, where reason is compared to a physician who heals the diseases of the soul: "As a good physician, using the cautery and the knife, causes pain to the body overtaken by disease, in the same way mind [reason] causes pain to the soul, withdrawing it from the pleasure that gives rise to every disease of the soul…Therefore, the mind that opposes this disease secures good for the soul, just as the physician secures health for the body." *CH* XII.2 (trans. Brian Copenhaver).
[66] See Fielding Garrison, *An Introduction to the History of Medicine*, 4th ed. (Philadelphia: W.B. Saunders Company, 1929), 58.

soul in the afterlife.[67] The copper man in Zosimus's allegory alludes to these rituals when he tells the people in the boiling waters to "keep their eyes upward and their mouths open."[68] The barber, then, while he speaks of the spirit fleeing the body, also stands for the preservation of the body. The metallic body is reduced to a blackened corpse, but this prepares it to receive the transforming spirit, or color. As the metal is resurrected, or transformed, more perfect "spiritualized" bodies emerge as silver and gold. The barber provides a sort of reassurance that even though the spirit is separated from the body, the vital links between spirit and body will remain, and when the spirit returns, the body—or one's experience of embodied existence—will be also be transformed by the spiritual ascent.

Indeed, Zosimus expresses a new understanding of embodiment when he awakens from these violent dreams. He has a revelation that nature is an interconnected whole, and that all of life is based on reciprocity:

> And I found that I understood it well. And I said that it was fair to speak and fair to listen, and fair to give and fair to receive, and fair to be poor and fair to be rich. For how does the nature learn to give and receive? The copper man gives and the watery stone receives; the metal gives and the plant receives; the stars give and the flowers receive; the sky gives and the earth receives; the thunderclaps give the fire that darts from them. For all things are interwoven and separate afresh, and all things are mingled and all things combine, all things are mixed and all unmixed, all things are moistened and all things dried and all things flower and blossom in the altar shaped like a phial.[69]

The act of sacrifice is also based on reciprocity, in the sense that humans give offerings to the divine in thanks for the gifts of life that they have received. Sacrifice is a means of honoring the ways in which earthly existence depends on divine grace, and for

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[67] See Serge Sauneron, *The Priests of Ancient Egypt*, 109; and Siegfried Morenz, *Egyptian Religion* (Ithaca: Cornell University Press, 1973), 155-158. Morenz says that the "opening of the mouth" ritual was also used to animate statues of deities with divine presence.
[68] Taylor, 58.
[69] Adapted from Taylor's translation, 58.

Zosimus, the sacrifice of metals and the offering of his own thoughts leads him to a deeper understanding of the interdependence of all things. He sees that earthly existence depends upon divine providence, and that all parts of nature depend on other parts for their existence. The macrocosmic rhythms of cosmic reciprocity are reflected in the microcosmic sacrifices occurring in the alchemical vessel, the phial-shaped altar.

The altar is an important symbol in this text. On one level it shows that Zosimus truly viewed his work as a "Sacred Art"; he represents the alchemical vessel as an altar in order to emphasize that alchemical operations need to be performed in both a corporeal and a spiritual manner. The altar is always described as being shaped like the phial, or cap of the apparatus, which is where the vaporized "spirits" of the metals condense as they are sublimed. The bowl-shaped altar also evokes the mixing-bowl of the Demiurge, the divine craftsman. In Plato's *Timaeus*, the Demiurge creates the ordered cosmos out of disorderly, chaotic matter.[70] He fashions the divine World Soul in a mixing-bowl, and from the leftover ingredients he creates human souls.[71] The Demiurge figures prominently in late antique philosophical and religious thought, including Hermetism, which is Zosimus's primary religious orientation. In Hermetic literature, the Demiurge is identified as the craftsman of the cosmos and the son of the One God. He is often called the "divine mind," and is the equivalent of *nous* in Neoplatonic metaphysics. In the Hermetic text entitled *The Mixing Bowl*, the Demiurge created all humans with reason, but not all of them have mind (*nous*), which in this context means knowledge of one's divine essence. The Demiurge puts mind in a mixing bowl and sends it down to humans, placing it "between souls," as a prize for

[70] *Timaeus* 30a.
[71] Ibid., 41d.

them to win. He has a messenger announce the following proclamation: "Immerse yourself in the mixing bowl if your heart has the strength, if it believes you will rise up again to the one who sent the mixing bowl below, if it recognizes the purpose of your coming to be."[72] Those who immerse themselves in the mixing bowl that contains the divine gift of mind become perfected; they become "immortal rather than mortal….for in a mind of their own they have comprehended all—things on earth, things in heaven and even what lies beyond heaven."[73] Zosimus alludes to this text in *Final Account*, when he tells Theosebia to "spit on matter and, hastening towards Poimenandres [sic] and receiving baptism in the mixing-bowl, hasten up towards your own race."[74]

In Zosimus's dream, the altar first appears in the "temple of punishments," and the people immersed in the altar's boiling waters are suffering as their bodies are being transformed into spirits. There are fifteen steps that lead to this altar. When the sacrificing priest appears at the altar a mysterious voice proclaims that he has "accomplished the descent of the fifteen steps of darkness and the ascent of the steps of light."[75] Throughout the rest of the allegory, Zosimus mentions only seven steps. He says he wishes to "ascend the seven steps and to look upon the seven punishments," which refers to the seven celestial zones ruled by the seven planets.[76] The fifteen steps, then, can be divided into seven descending steps and seven ascending steps; the remaining step is the ogdoad, or eighth region: the realm of the fixed stars.[77] The

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[72] *CH* IV.4 (trans. Brian Copenhaver).
[73] Ibid., IV.5.
[74] Fowden's translation, *The Egyptian Hermes*, 123. Poimandres is a divine being and revealer of wisdom in the Hermetic tradition.
[75] Taylor, 57.
[76] Ibid., 59.
[77] Mertens proposes that the numbers fifteen and seven refer to the number of days involved in performing certain aspects of the alchemical operation, which could also be the case. See *Zosime de Panopolis: Mémoires Authentiques*, 226, n. 3.

people in the altar are at the bottom of the descending steps; the violence in the temple of punishments and the torture of the agitating waters signifies the material world and the soul's imprisonment in the body. The goal is for them to become spirits and ascend the steps of light.

At the end of Lesson One, Zosimus (in a waking state) instructs his readers to build a temple "of one stone," that has "neither beginning nor end in its construction":

> Let it have within it a spring of pure water glittering like the sun. Notice on which side is the entry of the temple, and, taking your sword in hand, so seek for the entry. For narrow is the place at which the temple opens. A serpent lies before the entry guarding the temple; seize him and sacrifice him. Skin him and, taking his flesh and bones, separate his parts; then reuniting the members with the bones at the entry of the temple, make of them a stepping stone, mount thereon, and enter. You will find there what you seek.[78]

The temple without beginning or end is the infinite abode of the divine, and the glittering spring of pure water represents the cosmological waters that serve as a veil between the temporal cosmos and the infinite divine realms above.[79] The serpent guarding the entrance is the Ouroborus, the tail-biting snake whose body encircles the cosmos, symbolizing the ogdoadic realm of the fixed stars. To sacrifice the snake is to pass through the cosmic boundary and enter the infinite temple of the divine. The celestial serpent is a popular symbol in Greco-Egyptian alchemy, frequently depicted with inscriptions such as "the One is the All."[80] It is associated with mercury, but also with the unity of matter, or what Zosimus calls the "one nature," or "the nature." Zosimus's instructions for sacrificing the snake involve separating its parts and putting

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[78] Ibid., 58-59.
[79] The cosmological waters are found in many mythologies, including the Hebrew Bible, and Gnostic and Hermetic texts. In addition to serving as a veil, they can also represent the flow of creation.
[80] The *Chrysopoeia of Cleopatra* includes several drawings of the Ouroborus with inscriptions such as "One is All," "One is All and through it is All, and to it is All, and if it has not All, All is nothing." See H.J. Sheppard, "The Ouroboros and the Unity of Matter in Alchemy," *Ambix* 10, 2 (June 1962): 83-96.

them back together again. This resembles his own research into the workings of nature, and how his contemplative "sacrifice" involves a realization of how the parts of nature—metals and chemical reactions in this case—reflect the workings of nature as a whole. Once the cosmic parts are reconstituted, or the vision of nature as whole is attained, this deep understanding of the "one nature" becomes a stepping-stone to the noetic realm beyond the cosmos. As the alchemist transcends the material cosmos and arrives at the divine temple of the infinite, the phial-shaped altar becomes the mixing-bowl of the Demiurge. The people immersed in the mixing-bowl, transforming their bodies into spirits, will attain the divine gift of mind and acquire knowledge of "things on earth, things in heaven and even what lies beyond heaven."[81]

Zosimus's alchemical work imitates the cosmogenesis of the Demiurge in that it involves bringing the "chaotic matter" of the base metals into a new ordered form.[82] According to Plato, the Demiurge brought this invisible matter, which has no qualities in and of itself, into order by giving it form: the four elements are the primary visible manifestations of this underlying matter, and this cosmic matter is sustained by the divine World Soul, the intelligent, ordering principle of the cosmos that engenders all physical being. This is the "one nature," which continuously acts and reacts upon itself. When Zosimus awakens from these dreams and understands how nature gives and receives, he proclaims that the natural methods he employs in his alchemical work are an extension of the creative method of the one nature:

> [I]t is by method, by measure and weight of the four elements, that the interlacing and dissociation of all is accomplished. No bond can be made

[81] *CH* IV.5
[82] Gregory Shaw argues this point regarding Iamblichus's views of theurgy in *Theurgy and the Soul*, 15. My reading of Zosimus is influenced, in part, by Shaw's portrayal of Iamblichean theurgy as "demiurgy."

> without method. It is a natural method, breathing in and breathing out, keeping the arrangements of the method, increasing or decreasing them. When all things, in a word, come to harmony by division and union, without the methods being neglected in any way, the nature is transformed. For the nature being turned upon itself is transformed; and it is the nature and the bond of the excellence of the whole world.[83]

Zosimus believes that in order to understand the method by which the one nature organizes and transforms itself, one not only has to experience the "one nature" from a spiritual perspective, which is accomplished by "turning upon oneself" in the act of meditation, but one also has to transcend nature and behold the divine mind of the Demiurge, the creator of the universe who devised this "method" of organization.

The entire purpose of the alchemical work is encoded in the symbolism of Lesson One: the corporeal transformation of base metals into gold-colored metals, and the spiritual transformation of the alchemist. Both are accomplished by performing sacrifices that enable the spirit to flee the body. The remaining lessons are much shorter. In these lessons Zosimus describes the whitening and yellowing stages of the metal alloy, and also addresses issues regarding the art of spiritual discernment.

On Excellence: Lessons Two and Three

In Lesson Two, Zosimus gets lost. He writes, "Again I wished to ascend the seven steps and to look upon the seven punishments, and, as it happened, on only one of the days did I effect an ascent. Retracing my steps I then went up many times. And then on returning I could not find the way and fell into deep discouragement, not seeing how to get out, and fell asleep."[84] In his dream he encounters the helpful barber, who is now clad in red, royal garments, hinting at the gold that is to come. The barber offers

[83] Adapted from Taylor's translation, 58.
[84] Taylor, 59.

to show him the way to the "place of punishments," meaning the altar, but once they draw near, the barber is cast into the punishment and consumed by fire. "On seeing this I fled and trembled with fear," he says.[85] Zosimus awakens and realizes that the barber is the copper man dressed in red, and that it is necessary to cast him into the punishment. The message of this dream is to return one's wandering thoughts to the meditation as well as to the alchemical work, which is not yet complete.

Zosimus falls asleep, and finds himself once again "losing sight of the path, wandering in despair."[86] This time he meets Agathodaemon, "a white-haired old man of such whiteness as to dazzle the eye."[87] Agathodaemon fixes Zosimus's attention by staring at him "for a full hour."[88] When Zosimus asks him to reveal the way, Agathodaemon suddenly moves quite fast, hastening toward the right path and quickly reaching the altar. By the time Zosimus arrives at the altar, Agathodaemon has been cast into the punishment, just as the barber was before him. At this sight, Zosimus exclaims,

> O gods of heavenly natures! Immediately he was embraced entirely by the flames. What a terrible story, my brother! For from the great strength of the punishment his eyes became full of blood. And I asked him, saying, 'Why do you lie there?' But he opened his mouth and said to me 'I am the man of lead and I am undergoing intolerable violence.'[89]

Upon awakening, Zosimus understands with great clarity that one must "cast out the lead."[90] Casting the lead out will cleanse the metal of its impurities, and it also implies

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[85] Ibid.
[86] Taylor, 59.
[87] Ibid.
[88] Ibid.
[89] Ibid., 59-60.
[90] Ibid., 60.

that the lost Zosimus will find his way again when he returns his attention to the task of cleansing his soul of its material stains.

Technically speaking, these dreams refer to the whitening stage of the *kērotakis* process, as Agathodaemon's dazzling white appearance suggests. In an anonymous commentary on this passage from *On Excellence*, the author connects Agathodaemon with the waning moon, which is the alchemical notation for mercury.[91] He explains (not too clearly, I might add) that Agathodaemon is the whitened or silver-colored alloy, which he calls "lunarized magnesia."[92] The silver color is imparted to the alloy by treating it with volatized mercury, and he says that the metallic body is fixed, or amalgamated, as the active principle (mercury?) falls away.[93] Zosimus associates this fixing of the metal with the fixing of his attention, which helps him regain his focus and reunite with his goal of accomplishing a spiritual ascent.

As Michèle Mertens notes, Agathodaemon is a complex figure and it is difficult to determine exactly what he represents in this text.[94] Like Democritus and Hermes, Agathodaemon is a pseudonym used by alchemical authors, and he is frequently cited in Greco-Egyptian alchemical literature. Zosimus refers to the works and techniques of

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[91] On the waning moon as a symbol for mercury, see Taylor, 51. The commentary on this passage from *On Excellence* comes from a collection of alchemical commentaries written by various authors from various eras. The title of this particular commentary is "The Divine Zosimus on Excellence and its Interpretation," but this is somewhat misleading. The author only discusses a few passages from *On Excellence*, and his interpretations are purely technical. Most of the commentary is a comparison of the technical writings of various alchemical authors, such as Democritus, Ostanes, Hermes, and Stephanus (7th c. CE). Zosimus is included as one of these great alchemists, but he is not the main subject of the commentary.

[92] *CAG* III.6.9: "Par l'expression déclin, il parle de l'écoulement, et (cela) devient plus clair par l'addition de ces mots: 'ce qui tombe au déclin lunaire'; à ceux-ci: 'la substance de la lune.' En effet, le corps demeure fixé par le déclin. La nature de la magnésie lunarisée acquiert ainsi en totalité le caractère spécifique de la lune, et se développe à l'occasion du déclin (qui répond à la volatilisation du mercure). De telle sorte que le principe actif tombe (de la lune) par ce déclin, le corps (metallique) demeurant transformé."

[93] Berthelot's note on this passage explains that the volatization with mercury amalgamates and unites the metals (the copper and lead alloy), and gives the alloy a silver color. Ibid., n.1.

[94] Mertens, *Mém. auth.* XI, n. 11.

Agathodaemon on several occasions, and it is possible that this technique of amalgamation comes from Agathodaemon the alchemist. Agathodaemon, "the good daemon," is also the name of the civic god of Alexandria, and he was a popular deity in Greco-Roman Egypt, worshipped as a god of good fortune and also as the ruler of the cosmos.[95] He is often depicted as a man-headed snake and connected with the Ouroborus, the celestial serpent whose body encircles the cosmos.[96] In Hermetic literature, Agathodaemon is portrayed as a revered sage and quasi-divine figure who reveals the wisdom of the universe. According to some genealogies, he is the son of the god Hermes/Thoth, and the father of Hermes Trismegistus.[97] All of these understandings of Agathodaemon could be operating in this text.

In the late antique imaginary, the cosmos was heavily populated with daemons and angels. While Zosimus warns against the folly of invoking daemons, he nevertheless encounters them as he ascends through the planetary spheres. He seems to be portraying the barber and Agathodaemon as helpful daemons; they appear without being summoned and offer their assistance as the lost and despairing Zosimus attempts to resume his spiritual ascent. Once Zosimus regains his focus, signified here by his proximity to the altar, the beneficent daemons are cast into the punishment. Though this is terrifying to Zosimus in the dream, when he awakens he realizes that it is necessary to cast them into the flames. In *Final Account*, Zosimus advises Theosebia to offer meditative sacrifices that "repel and destroy the daemons" rather than entice them. The casting of the barber and Agathodaemon into the fire is consistent with this view.

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[95] See David Frankfurter, *Religion in Roman Egypt*, 63, 99; also Brian Copenhaver, *Hermetica* (Cambridge: Cambridge University Press, 1992), 165.
[96] See Copenhaver, ibid.; and Berthelot, *CAG* Vol. I, 18.
[97] Copenhaver, ibid., xv, 164-165.

Even though daemons can be helpful, they are merely cosmic beings, and their "material" status can hinder the soul's ascent to the immaterial realms if one becomes attached to them.

At the beginning of Lesson Three, Zosimus sees the sacrificing priest dressed in white, presiding over the phial-shaped altar. For the first time in this allegory, the altar is described as "divine" and "sacred," and not as a place of punishment.[98] Zosimus mounts the fourth step—which corresponds to the realm of the sun, and to the metal gold—and there he sees three men approaching from the east. One is holding a sword, and he is followed by another man who is bringing "someone with his arms bound behind his back, clothed in white and of a gracious aspect, whose name was 'culmination of cinnabar' (*mesoupanisma kinnabareōs*).[99] *Mesoupanisma* is an astrological term for the meridian, or southern point of the zodiac, which is directly overhead.[100] Since cinnabar is associated with the sun in alchemy, the name of the bound man can be interpreted in cosmic terms as the meridian of the sun, or the sun at noon—a "gracious aspect" because the sun is at the height of its journey through the sky.[101] The solar imagery and the redness of cinnabar indicate the final stages of the work, the yellowing and reddening. The silver-white alloy is about to become gold. The sword is handed to Zosimus, and he is told to sacrifice the man clothed in white: "Cut off his head and sacrifice his meat and muscles by parts, to the end that his flesh may first be boiled according to the method and that he may then undergo the

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[98] Taylor, 59.
[99] Mertens's translation, *Mém. auth.* XII.2: "…il y en avait un autre derrière lui, qui amenait quelqu'un avec les bras liés derrière le dos, vêtu de blanc et d'aspect gracieux, et dont le nom était 'culmination du cinabre.'"
[100] See Mertens, *Mém. auth.* XII, n. 11.
[101] This is Taylor's translation of the phrase, 60. Mertens explains that in some versions of this text (manuscripts A and L), the symbol for the sun is used rather than the word "cinnabar." See Mertens, ibid.

punishment."[102] Zosimus awakens, but the two dream characters are still present. They most likely represent the copper-lead alloy that has now been treated and colored gold. The one with the sword says, "You have fulfilled the seven steps beneath."[103] And the second man, at the same moment that the lead is cast out, proclaims: "The work is completed."[104]

The vision of the man arriving from the east, with another man following close behind, bringing the meridian of the sun, is reminiscent of the passage in Zosimus's *On Electrum* where the mirror of the mind is placed in the west so that it may reflect the eastern and southern points of the cosmos, where the "intellectual light shines." The east is the ascendant, where the planets first appear on the horizon; their ascent culminates at the meridian (south), and thereafter they begin to descend. Zosimus uses this cosmic imagery to convey the onset of his divine revelation. He must take the sword in hand and sacrifice the solar man, who represents the revelatory peak, the height of heaven, the attainment of gold. The solar man clad white is the sacrificing priest, because when Zosimus first encounters the priest in Lesson One, the priest claims that someone had dismembered him with a sword, cut off his head, and burned his bones and flesh in the fire of the treatment. Zosimus is instructed to do the same. This priest, who presides over the divine and sacred altar, is an image of the Demiurge, but this image is still marked by material stains; he appears with his hands bound, and his "flesh" needs to be cut away and boiled in the treatment. Therefore the final sacrifice is made in order to repel the image. Zosimus indicates that the slaying of this

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[102] Taylor, 60.
[103] Ibid.
[104] Ibid.

image culminates in an ineffable vision of the noetic realm of the Demiurge: the ascent has been accomplished, the lead has been cast out, and the golden color attained.

On Excellence as a spiritual exercise

Zosimus may have written *On Excellence* as type of spiritual exercise for his students, as a means of training them to look beyond the material and penetrate the spiritual significance of their work. Hadot observes that ancient philosophers often viewed philosophy as an "exercise of death," where the philosopher aims to separate soul and body by freeing the soul of all its worldly passions and attachments; this results in a transformation of the self, a death and rebirth.[105] Zosimus's allegory is almost entirely comprised of death and resurrection imagery. The characters are violently sacrificed and dismembered, boiled alive, consumed in the fire, and reappear again to undergo further torturous treatment until they become perfected, or made "gold." The exaggerated and often gruesome images probably served an initiatory purpose. Gregory Shaw explains that the Neoplatonist philosopher, Iamblichus, had his students read Plato's dialogues in a particular order, which he thought would aid their spiritual development. One of the first dialogues Iamblichus assigned was the *Phaedo*, where Socrates is on his deathbed and expresses negative views of the body as a prison for the soul. Shaw thinks that Iamblichus may have used this as a means of disrupting his students' contentment with material existence.[106] I think Zosimus may have assigned *On Excellence* with a similar purpose in mind. The startling imagery may have functioned to shock students out of their workaday perceptions of metals and chemical reactions, as well as their attachments to materiality.

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[105] Hadot, *What is Ancient Philosophy?*, 190.
[106] Shaw, *Theurgy and the Soul*, 37-38.

While materiality is represented as a disturbing, undesirable condition in this allegory, this does not mean that Zosimus has a pessimistic view of the world. From a demiurgical perspective, matter is chaotic until it is harmoniously arranged by the divine, and likewise, the soul is in a chaotic state, imprisoned in the body and agitated by the passions until it is brought into order through self-control and divine contemplation. This is indicated in the first lesson of the allegory, when he awakens from the violent dreams and somehow understands cosmic unity, the harmonious arrangement of the whole. The overarching message of *On Excellence* is to flee the body and become a "spirit," but the goal is transformation, not permanent escape. The base metals will be transformed into gold, the alchemist's soul will become more noble and virtuous through purification, and his understanding of nature will be expanded and refined.

Zosimus wants his students to work on purifying their souls of material stains, as well as to closely observe the metals and grasp the ways in which they reveal the divine mind and the "one nature" acting upon itself. He believes that spiritual work is essential, whether practiced at home or in the workshop, and that alchemists should strive to perfect themselves and their Art by contemplating the divine at every opportunity. As he advises his student, Theosebia, "Don't stop meditating and working, and you will understand."[107]

[107] Zosimus, *CMA*, Syr. II.11.21.

CHAPTER THREE:

JEWISH THOUGHT AND NATURAL *VS.* UNNATURAL METHODS

Zosimus's emphasis on Jewish thought is exceptional in early alchemical literature. He is the first known alchemist to write about Jewish metallurgical techniques, which he praises highly, and he incorporates Jewish religious ideas into his writings to such a degree that some medieval Arab alchemists, and at least one modern scholar, have claimed that Zosimus was Jewish.[1] Zosimus was not Jewish, however, because he clearly distinguishes between his Egyptian Hermetic beliefs, and those held by the Jews.[2] I shall argue here that Zosimus attempts to harmonize Jewish and Egyptian metallurgical techniques, and, since he is also establishing a spiritual approach to alchemy, his synthesis is religious as well as technical.

This chapter begins with a discussion of Jewish alchemy. Scholars have debated over whether there was such a thing as Jewish alchemy in this period, and I will address this topic, as it helps to illustrate what Zosimus means by "Jewish" metallurgical traditions, but I am far more interested in the ways in which he uses certain Jewish religious ideas to express his "natural" chemico-religious philosophy and to argue against the "unnatural" methods practiced by rival alchemists. In fact, in

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[1] On medieval Arab references to "Zosimus the Jew," see Raphael Patai, *The Jewish Alchemists* (Princeton: Princeton University Press, 1994), 56. In *Tabula smaragdina* (1929), Julius Ruska proposed that Zosimus may have been Jewish, but scholars generally agree that there is not enough evidence to support this claim. See Patai, *The Jewish Alchemists*, 56. In addition, several scholars have labeled Zosimus a "gnostic," and though they seem to be implying that Zosimus exhibits Jewish/Christian forms of gnosticism, they could be using this term in a broader sense. See, for example, M. Berthelot, *Les origines de l'alchimie* (Paris: G. Steinheil, 1885), 2, and Berthelot and Ruelle, *CAG* Vol. 1, 9; C.G. Jung, *Alchemical Studies*, 59; and J.R. Partington, *A History of Chemistry*, Vol. 1, Part 1 (London: MacMillan and Co., 1970), 267.

[2] For example, throughout *On Apparatus and Furnaces (Letter Omega)*, Zosimus refers to "our" Hermetic or Egyptian beliefs, as distinct from "their" Jewish beliefs and traditions. See *Zosimus of Panopolis On the Letter Omega*, trans. Howard Jackson.

almost every instance where Zosimus expounds on Jewish religious thought, it is in the context of promoting his natural methods over the unnatural methods of his rivals. I will examine these polemics in detail, focusing particularly on his use of themes from two Jewish apocryphal works, *Testament of Solomon* and *Book of Enoch* (1 Enoch), which were apparently influential among early alchemists, as well as on Zosimus's text, *On Apparatus and Furnaces (Letter Omega)*, in which he draws upon Hermetic, "gnostic," and Greek mythologies in order to present a universal doctrine of the Anthropos, or primal man, which he uses to teach Theosebia about the difference between material and spiritual forms of knowledge.

Jewish alchemy

As Raphael Patai notes in *The Jewish Alchemists*, scholars have come to wildly different conclusions about Jewish alchemy: some claim that Jews invented alchemy and played a major role in its development throughout history, while others argue that Jewish participation in alchemy was either insignificant, or non-existent.[3] Neither of these positions is viable, as Patai demonstrates in his history of Jewish alchemy, but in reading the works of Zosimus alone, one can see how scholars have arrived at these extreme conclusions. If one takes Zosimus literally (as Patai tends to do), it does indeed appear as though Jewish metallurgists were instrumental in the development of alchemical theory and practice.[4] On the other hand, a more critical analysis of Greco-Egyptian alchemical texts, taking pseudonymous authorship and other ancient literary

[3] See Patai's discussion in *The Jewish Alchemists*, 7-17.
[4] Patai's discussion of Jews in Hellenistic alchemy (in Part Two of *The Jewish Alchemists*) is flawed due to his literal reading of Zosimus and other early alchemical texts, and his use of later alchemical works to support his points about early alchemy. His work also contains several errors, and should be used with caution.

conventions into account, such as the tendency to impart a sense of authority to texts and teachings by claiming that they originated in ancient Near Eastern cultures (especially Egyptian, Chaldean, and Hebrew cultures), can lead to the conclusion that "Jewish" alchemical texts are not Jewish at all.

In the Greco-Egyptian alchemical texts that date from Zosimus's time or earlier, there are works by two alchemists who may have been Jewish. The first and most influential is Maria the Jewess (ca. 2nd century CE), who is quoted extensively by Zosimus, though none of her original texts survive. There are also a few alchemical recipes attributed to Moses, which are difficult to date,[5] but some were circulating in Zosimus's day, because he refers to a text called *Maza of Moses*.[6] John Gager has argued that these "Jewish" alchemical authors may not have actually been Jewish, because their writings were not preserved in Jewish circles, and non-Jewish alchemists may have used these names as pseudonyms—particularly that of Moses—in order to give their writings an aura of antiquity and authority.[7] Moses was widely renowned in the Greco-Roman period as a holy man, magician, and a great inventor, and many

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[5] There are two Mosaic recipes in the Greco-Egyptian alchemical literature: a lengthy recipe entitled *Chemistry of Moses* (*CAG* IV.22), and a short recipe called *Diplosis (Doubling) of Moses* (*CAG* I.18). Scholars typically assign an early date to these Mosaic recipes, between the second and third centuries CE, but there are reasons to believe they are from a later period. See Berthelot, *CAG* Vol. III, 287, n. 7; and F.S. Taylor, "A Survey of Greek Alchemy," 12. Taylor notes some of the problems in dating the Mosaic recipes in "The Origins of Greek Alchemy," 38-39.

[6] According to medieval commentators, *maza* is a synonymous term for alchemy; in Greek, *maza* can refer to a lump of something—for alchemists it probably referred to a "lump" of metal, or an amalgam. For Zosimus's reference to the *Maza of Moses*, see *CAG* III.24.4-5, and also Berthelot's note to *CAG* III.43.6. Alchemical definitions of the term *maza* can be found in *CAG*, Vol. I, 209. See also John Gager's discussion of *maza*, in *Moses in Greco-Roman Paganism* (Nashville: Abingdon Press, 1972), 153.

[7] Gager, *Moses in Greco-Roman Paganism*, 155. The alchemical author "Moses" most likely refers to the biblical Moses, and not to a Hellenistic alchemist with that name. Zosimus mentions that Jewish metallurgical writings "speak of an inexhaustible mass which Moses obtained following the precept of the Lord." (See *CAG* III.43.6: "Voilà pourquoi dans les écritures juives et dans toute écriture, on parle d'une masse inépuisable que Moïse obtenait d'après le précepte du Seigneur.") The biblical identity of Moses is made even more explicit in *Chemistry of Moses*, which opens with a reference to the biblical Moses and a paraphrase of Exodus 31: 2-5. See *CAG* IV.22.1.

Jewish and pagan texts were pseudonymously attributed to him.[8] The alchemical recipes attributed to Moses follow the same literary conventions as the recipes attributed to Hermes, Ostanes, and Democritus, who were also popularly regarded as wise men and magicians. As for Maria the Jewess, this name could also be a pseudonym. Medieval alchemists associate her with Moses's sister, Miriam, and also with the Virgin Mary; some also claim that she was a pupil (or teacher) of the great Ostanes.[9] However, these legendary portrayals of Maria do not appear until the ninth century, and Zosimus gives no indication that she has any relationship with these biblical or legendary figures.[10] Most scholars are inclined to think that Maria is not a pseudonym, but that she was an actual historical figure; however, there is no conclusive evidence to support this.

The writings of Moses and Maria are technical works, and therefore it is difficult to determine if these texts represent a *Jewish* tradition of alchemy. The Mosaic recipes include a few brief religious references, which indicate that a Jewish writer(s) may have produced these texts. The *Chemistry of Moses*, for example, opens with a paraphrase of Exodus 31:2-5: "And the Lord said to Moses, 'I have chosen the priest, Beseleel by name, of the tribe of Judah, to work gold, silver, copper, iron, all workable stones and wooden artifacts, and he will be master of all trades.'"[11] Another recipe, the *Diplosis (Doubling) of Moses*, contains a reference to God: "Melt while

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[8] For a thorough study of how Moses was perceived in late antiquity and portrayed in pagan literature, see Gager, *Moses in Greco-Roman Paganism*. On Moses as an inventor, see Louis Feldman, *Jew and Gentile in the Ancient World* (Princeton: Princeton University Press, 1993), 286-287.
[9] See Patai, *The Jewish Alchemists*, 75.
[10] As Patai notes, E.O. von Lippman, an influential scholar of early alchemy, claims that Zosimus identifies Maria with Miriam, the sister of Moses, but there is no evidence of this in the Greek or Syriac versions of Zosimus's works. See Patai, *The Jewish Alchemists*, 74.
[11] Gager's translation, 153.

narrowing the funnel and you will find, with the help of God, the whole to be gold."[12] There are no religious remarks in the excerpts of Maria's writings preserved by Zosimus, but there is one in a fragment cited by the alchemist Olympiodorus (ca. 5th or 6th century): "Maria says again: 'Do not touch it with your hands; you are not of the race (*genos*) of Abraham; you are not of our race.'"[13] Despite these religious references, Gager remains skeptical of Jewish authorship.[14] Patai, on the other hand, takes these statements as indubitable evidence that Maria and Ps-Moses were Hellenistic Jews.[15]

I agree with Patai that these texts were most likely authored by Jews, though my reasons differ. Both Patai and Gager are so focused on Jewish references in *alchemical* literature that they overlook the fact that metallurgy is an ancient art, and that Jewish metallurgists had their own craft traditions, which undoubtedly included the written transmission of metallurgical recipes and techniques. In the Babylonian Talmud, which dates from Zosimus's era (3rd-4th centuries), there is mention of Jewish guilds of metalworkers in Alexandria who apparently exercised a great deal of control over their craft and trade.[16] Zosimus speaks of Jewish metallurgy as a distinct (and ancient) tradition, and claims that they carefully guard their trade secrets and initiatory formulas,

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[12] Ibid.
[13] *CAG* II.4.54: "Marie dit encore: 'Ne va pas toucher avec tes mains; tu n'es pas de la race d'Abraham; tu n'es pas de notre race.'" On the dates of Olympiodorus, see C. Viano, "Olympiodore l'alchimiste et les présocratiques: une doxographie de l'unité," in *Alchimie: art, histoire, et mythes*, ed. Didier Kahn et Sylvain Matton (Paris: S.É.H.A., 1995), 99-102.
[14] Gager only discusses the religious references made by Ps-Moses, not those by Maria, but he does say that he is hesitant to claim that either of these authors were Jewish. See *Moses in Greco-Roman Paganism*, 153-155.
[15] Patai, *The Jewish Alchemists*, 32, 69-70.
[16] See Christopher Haas, *Alexandria in Late Antiquity*, 97.

and that they are like the Egyptians in this regard.[17] He is probably referring to the traditions of Jewish craft guilds. In addition, Zosimus frequently refers to Jewish metallurgical books. In a letter to his colleague, Theosebia, he says that when he was visiting her at her home, he was watching her servant cooking poultry (steaming it) and this led him to wonder if a similar technique could be applied to the cooking and coloring of metals. He thought that the "ancients" might have described an apparatus for this, and he found the description he was looking for in "the Jewish books."[18] In *On Electrum*, Zosimus mentions another Jewish metallurgist, telling Theosebia that she can find information on "the mixture, weight, and the treatment of each of the bodies and precious stones in the Jewish writings, mainly those by Apilis, son of Gagios."[19] He also claims that a Jew named Theophilus, son of Theogenes, wrote a book describing Egypt's goldmines.[20] It is unknown whether these books were "alchemical," but they nevertheless indicate that Zosimus was acquainted with what he considered to be Jewish writings on metallurgy.

Of the Jewish authors mentioned by Zosimus, none is referred to as frequently or with greater respect than Maria the Jewess. He regards her as a great "ancient" master of the craft, on a par with Democritus, and he cites them both extensively.[21] Maria's contributions to the metallurgical arts include her invention (or mastery) of

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[17] Berthelot's translation of this portion of the text (*CAG* III.51.5) is not very accurate. See Festugière's translation in *La Révélation d'Hermès Trismégiste* Vol. I, 278, or Jack Lindsay's English translation, based on Festugière's, in *Origins of Alchemy in Graeco-Roman Egypt*, 336.

[18] See *Mém. Auth.* VIII.1-2. The apparatus in question is the *tribikos*, a distillatory device; in another text, which he must have written at a later date, Zosimus gives Maria's technique for working copper using a *tribikos*. Michèle Mertens comments that Zosimus usually refers to Maria by name, so the "Jewish books" where he found the description of the *tribikos* were probably not the writings of Maria. See Mertens, *Mém. Auth.*, 197-198, n.5.

[19] *CMA*, Syr. II.12.5: "Tu trouveras le mélange, le poids et le traitement de chacun des corps et des pierres précieuses dans les écrits juifs, et principalement chez Apilis, fils de Gagios."

[20] See *CAG* III.51.2.

[21] Zosimus proclaims Maria to be an "ancient" author in *CAG* III.24.3.

particular distillatory apparatuses and techniques, including the *kērotakis* process, which Zosimus describes in religious language in his allegory, *On Excellence*.[22] Maria emphasizes distillation more than any other early alchemical writers, and F. Sherwood Taylor has postulated that Maria and Democritus represent two distinct schools of alchemical theory and practice: the Marian school focused on distillation and sublimation methods (vapors), whereas the Democritean school emphasized cementation and fusion methods (powders).[23] Zosimus, in Taylor's assessment, belongs to the Marian school.[24] But as Robert Multhauf argues, it appears as though Zosimus is actually trying to synthesize the two schools:

> The materials mentioned by Zosimos are virtually identical to those in the earlier Egyptian sources, but the method of manipulating them is quite different. Zosimos tends to convert (Bolos) Democritus' cementation processes into distillatory processes, using apparatus associated with Maria, and although Democritus mentioned distillation briefly in *Physica et Mystica*, with a claim to have written on it more extensively elsewhere, we not only lack any such work but find that where Zosimos refers to (Bolos) Democritus in connection with distillation he usually does so in an attempt to show him to be in agreement with Maria.[25]

Zosimus regards the Egyptians and Jews as metallurgists *par excellence*, and Maria's distillatory techniques undoubtedly factor into his great respect for the Jewish tradition. In *The True Book of Sophe the Egyptian and of the Divine Lord of the Hebrews and the Powers of Sabaoth,* Zosimus extols Maria's *kērotakis* methods along with "Egyptian" doubling (*diplosis*) methods for yellowing copper, and claims that

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[22] Patai rightly points out that there is an ambiguity in Zosimus's writings as to whether Maria actually invented the devices and processes she describes. See Patai, *The Jewish Alchemists,* 60. However, throughout the history of alchemy Maria was reputed to be an inventor of several alchemical apparatuses, including the *kērotakis* and the water-bath (or double boiler). It is widely recognized that the *bain-marie*—the French term for the double boiler, which is still in current usage—is named after Maria the Jewess.

[23] See F.S. Taylor, "A Survey of Greek Alchemy," 114-118.

[24] Ibid., 119.

[25] R. Multhauf, *The Origins of Chemistry*, 104.

Jewish and Egyptian alchemists are united by a common spiritual philosophy that represents the best of their science and wisdom:

> There are two sciences and two wisdoms: that of the Egyptians and that of the Hebrews, which is rendered sounder by divine justice. The science and the wisdom of the best dominate both: they come from ancient centuries. Their race (*genea*) is devoid of a king, is autonomous, free of passion (*apathōs*); it does not search for material and corruptible bodies; it operates without submitting to [foreign] action, sustained now by prayers and [divine] grace. Indeed, for those that save and purify the divine soul enchained in the elements, or rather the divine spirit mingled with the dough of the flesh, the symbol of chemistry is drawn from the creation of the world by means of example, because, just as the sun, flower of fire, is the celestial sun and the right eye of the world, so copper, if it becomes a flower by purification (i.e., takes the color of gold), is a terrestrial sun, which is a king on earth as the sun is king of the sky.[26]

The notion of a spiritual "race" that seeks to transcend materiality and unite with the divine in the spiritual realms beyond the cosmos is a common theme in Egyptian Hermetism and in Jewish and Christian "gnostic" literature, and the language of spirits fleeing their bodies is also technical language, used predominantly in descriptions of distillatory processes. Cosmic sympathies, which are "drawn from the creation of the world (*kosmopoiia*)," are particularly prominent in Egyptian alchemical writings, and appear to be basis of the "natural" methods practiced by Zosimus.[27]

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[26] The surviving versions of this text are in a corrupt state and very difficult to translate. I have consulted the original Greek as well as the French translations by Berthelot and Ruelle (*CAG* III.41.1) and by Festugière (*La Révélation d'Hermès Trismégiste* Vol. I, 261). My translation is largely based on Ruelle's, though I have adapted Festugière's translation of the last sentence of this passage, because it is better phrased. Ruelle: "Discours du livre véritable de Sophé l'Egyptien, du divin Seigneur des Hébreux (et) des puissances Sabaoth. Il y a deux sciences et deux sagesses: celle des Égyptiens et celle des Hébreux, laquelle est rendue plus solide par la justice divine. La science et la sagesse des meilleurs dominent les uns et les autres; elles viennent des siècles anciens. Leur génération est dépourvue de roi, autonome, immatérielle; elle ne recherche rien des corps matériels et corruptibles; elle opère sans subir d'action (étrangère), soutenue maintenant par la prière et la grâce (divine)." Festugière: "En effet, pour ceux qui sauvent et purifient l'âme divine enchaînée dans les éléments, ou plutôt le souffle divine mêlé à la pâte de la chair, le symbole de la chimie se tire de la création du monde par manière d'exemple, car, de même que le soleil, fleur du feu, est soleil céleste et œil droit du monde, ainsi le cuivre, s'il devient fleur par la purification, est-il un soleil terrestre, qui est roi sur la terre comme le soleil l'est au ciel."

[27] Zosimus credits Egyptians for being the first to allude to the secret "natural" methods for preparing timely tinctures in *Final Account* (*CAG* III.51).

Therefore, Zosimus is synthesizing these predominant features of Jewish and Egyptian science and wisdom, and presenting this as a unified "spiritual" theory of alchemy, which ultimately describes his own vision of alchemy.

Zosimus never clearly delineates what he means by "natural" and "unnatural" methods, though he does associate them with particular ideas. Natural methods, which involve creating alchemical tinctures in accordance with seasonal and celestial patterns, are associated with the purification of the soul and meditating upon divine signatures (*sunthēmata*) in order to trace cosmic sympathies and pathways of spiritual ascent; whereas he associates the unnatural methods of his rivals with demonology and certain types of astrology. He frames these as opposing methods for the preparation of "timely tinctures" (*karikai baphai*), and scholars have argued that Zosimus's polemics are targeted at alchemists who use astrology in their work, and that he is against astrological determinism.[28] However, I disagree that astrology is his main concern, because Zosimus believes that the planets, which were considered by many ancients to be "cosmic" gods or daemons, *do* have an influence on terrestrial activities.[29] In *On Excellence*, for example, he states that all alchemical research, though it is "multiple and varied," is nevertheless "subordinated to lunar influences and to the measure of time, which rule the end and the increase according to which the nature transforms itself."[30] Therefore, it appears that Zosimus does use a type of astrology in his alchemical practices (which, unfortunately, he does not explain), but that it *differs* from

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[28] See Ch. 1, n. 116, for a list of scholars who have argued along these lines. Daniel Stolzenberg gives the most thorough treatment of the subject of timely tinctures in "Unpropitious Tinctures: Alchemy, Astrology, and Gnosis According to Zosimos of Panopolis."

[29] In previous chapters I mentioned a few examples where Zosimus indicates that alchemical operations are performed at certain times, including his instructions for extracting mercury from cinnabar at the rising of Sirius, and his statement that certain operations should be performed when the sun has a nature that is favorable to the work. See Ch. 1, n. 117, and Ch. 2, n. 20.

[30] F. Sherwood Taylor's translation in *The Alchemists*, 57.

that of his rivals. All forms of astrology in this period are based upon theories of cosmic sympathy, but these theories were by no means uniform. I contend that at the heart of Zosimus's polemics are debates over certain understandings of cosmic sympathy and how knowledge of the cosmos is best attained; these debates include astrology, but are by no means limited to it. I will turn now to an examination of these polemics, and show how Zosimus uses Jewish thought to promote his natural methods and illustrate what he considers to be proper forms of cosmic and divine knowledge.

King Solomon the exorcist

In *Final Account*, Zosimus claims that "unnatural" methods were devised by daemons who were greedy for sacrificial offerings, and that these methods could only work with their assent. Natural methods, on the other hand, "act by themselves," and involve repelling the daemons, who are jealous of these methods.[31] Zosimus sometimes refers to these daemons as *ephoroi*, and as Daniel Stolzenberg has shown, other late ancient writers used this term, which means "guardians" or "overseers," to designate planetary gods, gods of polytheistic cultures (e.g., the Greek gods, Egyptian gods), as well as other cosmic beings that preside over various domains of human and terrestrial life.[32] Zosimus contrasts these cosmic daemons, who are "confined in the smallest places," with God, "who is everywhere."[33] At the end of *Final Account*, Zosimus tells Theosebia to "offer sacrifices to the daemons," not the ones that "nourish and entice them," he warns,

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[31] See Daniel Stolzenberg's translation of the relevant passages from *Final Account* in "Unpropitious Tinctures," 10-11.
[32] Ibid., 22-24. Though Stolzenberg notes that "*ephoroi*" denotes different types of gods, he stresses their role as planetary gods and identifies them with Archons of gnostic literature in order to show that Zosimus was against astrology and held a "gnostic" view that the planetary powers are evil. I will be arguing along different lines in this chapter.
[33] *CAG* III.51.8. Fowden's translation, *The Egyptian Hermes,* 122.

> …but rather the sacrifices that repel and destroy them, those of which Membres spoke to Solomon the king of Jerusalem, and especially those that Solomon himself wrote as the product of his own wisdom. So doing, you will attain the true and natural [tinctures] that are appropriate to certain times.[34]

In Zosimus's day, Solomon was renowned as a magician, exorcist, and astrologer. Several late ancient texts attributed to Solomon contain elaborate demonologies in which the daemons are mapped in astrological terms, as planetary daemons, governors of the decans of the zodiac, and rulers of particular hours of the day.[35] Zosimus appears to be familiar with several books of Solomon, but his allusion to the writings that "Solomon himself wrote" is most likely a reference to the *Testament of Solomon*.[36] There are many versions of this text, but the basic storyline is the same: An angel gives Solomon a magic ring that he uses to conjure legions of cosmic daemons. Each daemon resides in a specific location and has its own particular powers. Solomon compels them to reveal the nature of their meddlesome, evil powers, and to reveal the names of the angels who have the ability to thwart them. For example, when Solomon invokes the planetary daemons, they respond as follows:

> 'I am Deception. I plot deception and I devise the most evil heresies. But there is one who thwarts me, the angel Lamechiel.'
>
> The second said, 'I am Strife. I cause strife by making available clubs, pellets, and swords, my implements of war. But I have an angel who thwarts me, Baruchiel.'[37]

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[34] Ibid. "Membres" is most likely a reference to Mambres (also known as Jambres), who, according to Jewish lore, is one of two Egyptian magicians who opposed Moses in Exodus 7-11. The other is named Jannes, and the two are mentioned in 2 Timothy 3:8 and in other late antique literature. Though these magicians are mentioned in books of Solomon, Zosimus's reference to Mambres as Solomon's teacher is obscure, and not found in any of the surviving texts of Solomon. See D.C. Duling's introduction to his translation of *Testament of Solomon*, in *The Old Testament Pseudepigrapha* Vol. I, ed. J.H. Charlesworth (New York: Doubleday, 1983), n. 94.

[35] See Pablo Torijano's excellent study of these Solomonic texts in *Solomon the Esoteric King* (Leiden: Brill, 2002). In astrology, the term "decan" refers to a ten degree segment of the zodiacal circle; each of the twelve signs of the zodiac therefore has three decans, and they were/are used to give more nuanced astrological interpretations.

[36] As I will be discussing shortly, there is further evidence that Zosimus was familiar with the *Testament of Solomon*.

[37] *Testament of Solomon* 8:5-6, trans. D.C. Duling, ibid. This text will hereafter be abbreviated as *TSol.*

With this knowledge, Solomon gains power over the daemons and commands them to help him build the Temple. Most versions of this story end badly, however, when Solomon falls in love with a "Shummanite" woman who adjures him to offer sacrifices and build temples to foreign gods. Solomon does as his beloved requests, and the glory of God departs from him and he falls into ruin.[38]

This tale of Solomon, who conjures daemons and forces them to build the Temple, resonates with what Zosimus calls "unnatural" methods of practicing alchemy, which involve summoning cosmic daemons in order to enlist their help with the production of tinctures. But this story can also be interpreted in support of Zosimus's "natural" methods, which involve appealing to a higher divine source in order to understand the nature of cosmic powers and attain mastery over them. Zosimus tells Theosebia to emulate Solomon's exorcisms, not his conjurations. Solomon exorcises the daemons in the name of God and the holy angels. As we have seen in the allegory, *On Excellence*, Zosimus receives instruction from the spirit beings he encounters in his chemico-religious work, but then he destroys them and continues his spiritual ascent toward the divine realms.[39] Of course, Zosimus always insists that one should remain focused on the divine, and this message is also expressed in the *Testament of Solomon*, because Solomon falls into ruin when he begins worshipping the daemons and loses sight of God.

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[38] See *TSol* 26. Duling includes some variant endings of the story in his notes to this section, and he also notes that the "Shummanite" woman could be a reference to Abishag, the Shunammite woman brought to King David in 1 Kings (1:1-4, 15; 2:17-22), or that it may be a derivative of "maid of Shulam" (Song 6:12; 7:1).

[39] There are other allusions to TSol in Zosimus's allegory. He instructs his reader to build a temple with the mind, as a means of contemplating the infinite abode of the divine. Zosimus says that this temple has a spring of pure water within it. Compare with *TSol* H 9: "And the Temple of the Lord God, in which a river has its source under his throne, was completed…." See Duling, 987, n. f (9).

In *On Electrum*, Zosimus refers once again to books of Solomon, in which an angel instructs Solomon to make seven bottles out of electrum and to trap daemons within these bottles. He writes:

> Among the Egyptians, there is a book called *The Seven Heavens*, attributed to Solomon, against the demons; but it is not correct (to say) that it is by Solomon, since these bottles had been brought at another time to our priests….After these writings were spread everywhere, still unfinished, they were corrupted. It is he (Solomon) who composed them, as I have said above. But Solomon only wrote a single book about the seven bottles, while some person invented and composed commentaries at different epochs to explain what this work contained; but in these commentaries there is some deception. All or almost all agree concerning the function of the bottles directed against the demons. These bottles acted like the prayer and the nine letters written by Solomon: the demons cannot withstand them.[40]

Again, this original book of Solomon is most likely the *Testament of Solomon*, since several ancient versions of this text have survived, and in many of them Solomon traps the daemons in jars.[41] Specific references to the seven jars of Solomon are found in *Testament of Solomon* E XI.3, though in this text the jars are made of bronze, not electrum.[42] Two Christian collections of exorcisms that date from approximately the fourth century also mention that Solomon trapped the daemons in jars made of bronze.[43] A reference to the seven jars of Solomon is also found in the Christian gnostic tractate, *Testimony of Truth*.[44]

The Egyptian book that Zosimus is discussing, *The Seven Heavens*, appears to be a metallurgical text in which the seven jars of Solomon are associated with the seven planets:

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[40] *CMA* Syr. II, 12.5. P. Torijano's translation, *Solomon the Esoteric King*, 180.
[41] See Duling's discussion of the various versions of TSol in *The Old Testament Pseudepigrapha* Vol. I, 937-939. In the version that Duling has translated, there are references to Solomon imprisoning demons in jars at 15:8-11, and 16:7.
[42] See Torijiano, *Solomon the Esoteric King*, 181-182.
[43] Ibid., 182.
[44] See *NHC* IX, 3: 69.31-70.30.

> The altered book that we possess entitled *The Seven Heavens* contains, in summary, the following [?]…The angel ordered Solomon to make these bottles. It adds: Solomon made the seven bottles according to the names of the seven planets, in conformity with the divine prescriptions for the working of the stone, for the mixing of silver, gold, and copper of Cyprus with the substance called *orichalkos* and copper of Marrah (?)….
>
> The wise Solomon also knows how to evoke the daemons; he gives a formula of conjuration and mentions the electrum, that is, the bottles of electrum, on the surface of which he inscribed this formula.[45]

Zosimus has a negative opinion of the altered, "corrupted" books that are based on Solomon's original, noting that they "contain some deception." *The Seven Heavens* is apparently one of these corrupted books, because he refers Theosebia to different works, including those of the Jewish metallurgist, Apilis, son of Gagios, where she can find proper instructions for the preparation and treatment of the nine necessary ingredients for making electrum. Elsewhere in this text, Zosimus rails against the deceptions found in alchemical books inspired by the daemons.[46] Even though *The Seven Heavens* is written "against the daemons," and therefore may not be representative of "unnatural" methods, Zosimus seems to think that any alchemical work that contains faulty information is inspired by daemons.

Zosimus thinks that the alchemical knowledge granted by daemons is inadequate because daemons are limited to specific locations and specific forms of knowledge and power; they do not possess an understanding of nature as a whole. Some of the astrological texts attributed to Solomon contain extensive tables of the propitious angels and daemons that govern every hour of each day of the week, along

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[45] *CMA*, Syr. II.12.5: "Le livre altéré, que nous possédons et qui est intitulé les Sept cieux, renferme, en résumé, ce qui suit (?). L'ange ordonna à Salomon de faire ces talismans (bouteilles). Il ajoute: Salomon fit les sept talismans (bouteilles), suivant le nombre des sept planètes, en se conformant aux prescriptions divines sur le travail de la pierre, pour le mélange de l'argent, de l'or et du cuivre de Chypre, avec le corps appelé orichalque et cuivre de Marrah (?)….

Le sage Salomon sait aussi évoquer les démons; il donne une formule de conjuration et il indique l'électrum, c'est-à-dire les bouteilles d'électrum, sur la surface desquelles il inscrivit cette formule."

[46] See *CMA,* Syr. II.12.1.

with specific prayers to the planets that must be recited before the cosmic spirits are summoned. In the *Hygromanteia of Solomon,* Solomon instructs his son, Rehoboam, in these methods of propitious timing:

> I impress upon you a method so that you, very dear Roboam [sic], may know that it is completely necessary to know the hour in which you want to accomplish your will: first, utter the prayer of the planet that is found in that hour; afterwards, adjure the angel and the servant, that is the daemon.[47]

Zosimus rejects this form of cosmic understanding, which was very popular in his day. Solomon is wise because he knows the names, locations, and powers of all the daemons, and how to manipulate these cosmic sympathies and antipathies. Zosimus, however, always refers to cosmic sympathies in natural terms, as the influence of moon, sun, and stars, never as the influence of angels or daemons who reside in the thirteenth degree of Aquarius, for example, or who govern the second hour of the third day of the week.

The Book of Enoch and the Origins of Alchemy

In a treatise entitled *On Tin (Letter Eta)*, Zosimus recounts for Theosebia a myth concerning the origins of alchemy:

> It is stated in the holy scriptures, dear woman, that there exists a race of daemons who have commerce with women and direct them. Hermes also mentions them in his book on natural sciences (*Phūsika*); and the entire book offers a meaning both manifest and hidden. He mentions it in these terms: The ancient and divine books say that certain angels were taken by passion for women. They descended to earth and taught them all of the operations of nature. It is about them (the angels) that our book says that those who became proud were driven from heaven, because they had taught to men all things evil, which do not serve the soul. They were the ones who composed [chemical] works, and from them came the first tradition concerning these arts. Their book is called *Chema*, and it is from this that chemistry received its name. The book is composed of twenty-four sections; each has its proper name, or letter, or

[47] From the *Hygromanteia of Solomon*, trans. Torijiano, *Solomon the Esoteric King*, 243.

> treatise…One of them is called *Imous*, another *Imout*….One section is called *Key*….One finds in this book the arts exposed in thousands of words.[48]

This myth appears to based upon the tale of the fallen angels in the *Book of Enoch* (1 Enoch), in which the angels, who lust after human women and mate with them, unleash much sin and evil in the world by teaching the women sorcery, including spells, the cutting of roots and plants, and the auguries of the earth, sun, moon, and stars.[49] Interestingly, metallurgy, jewelry making, and the fabrication of cosmetics, precious stones, and tinctures—all of which are alchemical arts—are also included in the Enochian list of offensive teachings.[50]

Kyle Fraser has addressed the ambiguity in Zosimus's appropriation of this myth: Zosimus appears to be endorsing the "unwholesome" view that the alchemical arts were taught by lustful fallen angels, but given his negative opinion of daemons (or fallen angels), this seems strikingly out of character.[51] Fraser notes that the polemics against "occult sciences" and technology in the Enochian myth reflect broader cultural

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[48] *CMA,* Syr. II.8.1: "Les saintes Écritures, ô femme! disent qu'il y a une espèce de démons qui ont commerce avec les femmes et les dirigent. Hermès en fait également mention dans son livre sur les (sciences) naturelles [Syncellus fragment has *Physika* here]; et tout son livre offre un sens à la fois manifeste et caché. Il en fait mention dans ces termes: Les livres anciens et divins disent que certains anges furent pris de passion pour les femmes. Ils descendirent sur la terre et leur enseignèrent toutes les opérations de la nature. C'est à leur sujet que notre Livre (la Bible) a dit que ceux qui s'étaient enorgueillis ont été chassés du ciel, parce qu'ils avaient enseigné aux hommes toutes les choses mauvaises, qui ne servent pas à l'âme. Ce sont eux qui ont composé les ouvrages (chimiques), et d'eux vient la première tradition sur ces arts. On appelle leur livre Chema (koumou), et c'est de là que la chimie (koumia) a reçu son nom. Le Livre se compose de vingt-quatre sections; chacune de celles-ci a son nom propre, ou lettre, ou traité…L'une d'elles est appelée *Imos*; une autre, *Imout*….Une section est appelée *clef*….On trouve dans ce livre les arts exposés dans des milliers de paroles."
George Syncellus (9th c.) cites and paraphrases this fragment from Zosimus in *Ecloga Chronographia* 14.4-11.

[49] See *1 Enoch* 6-8, trans. Matthew Black (Leiden: Brill, 1985). This myth is based on Genesis 6:1-5.

[50] E. Isaac, in his translation of this text, adds "alchemy" to this list, but notes that this is his rendering of the Ethiopian phrase, *tawaleto 'alam*, which he translates more literally as "transmutation of the world." Black, on the other hand, translates this phrase as "varieties of adornments," which makes much more sense given the context. See Isaac's translation of 1 Enoch 8:2, in *The Old Testament Pseudepigrapha*, Vol. 1, ed. J.H. Charlesworth, n. 8d.

[51] See Kyle Fraser, "Zosimos of Panopolis and the Book of Enoch: Alchemy as Forbidden Knowledge," *Aries* 4, 2 (2004): 125, 131-132.

suspicions of magic and illicit religious practices, and he argues that Zosimus uses this myth strategically to condemn the "profane" or unnatural alchemy of his competitors and thereby legitimize his own "spiritual" form of alchemy.[52] I agree with Fraser, but he is basing his argument solely on the fragment of Zosimus's myth that was preserved by George Syncellus in his *Chronographia* (9th c.), and not on the version found in the Syriac treatise, *On Tin*, which provides additional context for this account of alchemy's origins. In addition, the polemics against magic in the *Book of Enoch* should be understood in terms of the larger points being made in that text about nature and divine power, which are similar to Zosimus's own views.

Zosimus thinks highly of the book, *Chema* (probably *Chēmia*, in Greek), which supposedly contains the alchemical teachings of the fallen angels, but he adds that there are numerous commentaries on this text, which "contain nothing good." He regrets that the commentators have not only "spoiled these books on chemistry, but they have made them into mysteries."[53] These false "philosophers," as he calls them, are trying to instruct Theosebia, but Zosimus reminds her that she has more philosophical wisdom than they do, since she knows the difference between "body and soul."[54] He opens his letter to Theosebia with the myth of the fallen angels, who seduce women and teach

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[52] Ibid., 131-132, 145.

[53] *CMA,* Syr. II.8.1: "Mais ces commentateurs n'écrivirent rien de bon. Non seulement ils gâtèrent les livres de la chimie (koumia); mais ils en firent des mystères."

By "mysteries," Zosimus apparently means that mystery schools, requiring oaths of secrecy, have grown up around these corrupt interpretations of alchemy. In this text he criticizes Theosebia for requiring oaths of secrecy from her students, and for restricting access to certain books.

[54] Ibid.: "Sans doute ils voulaient vous instruire; or, s'ils instruisent les âmes, c'est qu'ils sont des philosophes. Si tu es philosophe, ne mens donc pas; car tu sais ce qu'est l'enseignement, ce qu'est le corps et l'âme, et chaque fois accomplis ton devoir."

In his letters, Zosimus frequently warns Theosebia not to fall prey to these false teachings; it appears to be an ongoing concern of his.

them the alchemical arts, in order to show her that she, too, is being seduced by these false philosophers who want to instruct her in their arts.

It seems odd that Zosimus would approve of the chemistry books attributed to the fallen angels, but a version of this myth is also found in a Hermetic alchemical text entitled *Isis the Prophetess to Her Son Horus*, which Zosimus most likely read and approved of, because many of the ideas espoused in this text are similar to his own.[55] In this text, Isis explains to Horus that "by the permission of a favoring season and according to the necessary movement of the spheres," an angel from "the first firmament" spied her and wanted to mate with her, but she refused his advances, demanding that he must first reveal the mysteries of the preparation of gold and silver.[56] The angel was not able to explain them, but a superior angel named Amnael, who *did* know the mysteries, appeared and he, too, was seized by desire for Isis. He repeatedly tried to seduce her, but Isis states that she did not succumb: "I triumphed over his lust until he was ready to show me the sign on his head and reveal to me, generously and without hiding anything, the sought-for mysteries."[57]

Due to her persistent rebuffing of the angel, which Zosimus would surely applaud, Isis was able to gain mastery over Amnael, and he revealed to her the alchemical knowledge. It appears that she did not have to mate with him in return,

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[55] Olympiodorus preserves a fragment from a lost book of Zosimus (*On Energy*) in which Zosimus quotes a passage from *Isis to Horus*, and cites Hermes as the author. The alchemical author, Hermes, may have been the author of *Isis to Horus*, or perhaps Zosimus simply means to imply that this is a Hermetic work. See *CAG* II.4.32.8.

[56] There are two extant versions of this text, "A" and "E," and they have been translated into French by Berthelot and Ruelle (*CAG* I.13), and by Festugière. I am using Jack Lindsay's English translation, which is based on Festugière's. Lindsay synthesizes the two versions, using E as the base text, and placing his insertions from manuscript A in brackets. The quotation I have used here is from text A. See Festugière, *La Révélation d'Hermès Trismégiste* Vol. I, 256-260; and Lindsay, *The Origins of Alchemy in Graeco-Roman Egypt*, 194-195.

[57] Lindsay, 195. Quotation is from text E.

because the moral lesson of this story, which she imparts to Horus, centers on the notion that like begets like:

> So go then, my child, to a certain laborer [Achaab] and ask him what he has sown and what he has harvested, and you will learn from him that the man who sows wheat also harvests wheat, and the man who sows barley also harvests barley. Now that you've heard this discourse, my child, learn to comprehend the whole fabrication, *demiourgia*, and generation of these things, and know that it is the condition of man to sow a man, of a lion to sow a lion, of a dog to sow a dog, and if it happens that one of these beings is produced against the order of nature, he has been engendered in the state of a monster and cannot subsist. For one nature rejoices in another nature, and one nature conquers another nature.[58]

In the Enochian myth, which is based on Genesis 6:1-4, the angels mate with human women and beget a race of giants called the Nephilim. Isis's claims that such breeding is "against the order of nature" and "engenders monsters" are in full agreement with the sentiments of the Jewish scriptures. Her point is that it is "unnatural" to love the daemons, and Zosimus may have understood this as a polemic against "unnatural" alchemical methods.

Isis to Horus also promotes concepts that Zosimus associates with natural methods. It teaches that alchemists can acquire knowledge from cosmic spirits, such as angels or daemons, but should also resist their influence. It also describes a type of astrology in which the activities of cosmic spirits are subordinate to natural cycles: the angels appear only "by permission" of a favorable season and planetary alignment. The

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[58] Ibid. In the fragment preserved by Olympiodorus (see n. 55 above), Zosimus refers to the laborer Achaab. He writes: "For the truth of my words, I take Hermes to witness. He declares: Go to Achaab the laborer and learn that he who sows wheat brings wheat to birth. Similarly I too have told you that substances are tinctured by substances as it is written: as to the tincturing, it is divided into two kinds, the bodily and the incorporeal. The Art limits itself to these two kinds." Trans. J. Lindsay, *The Origins of Alchemy*, 196. This distinction between corporeal and incorporeal alchemy is consistent with his comment to Theosebia in *On Tin*, about knowing the difference between body and soul. Corporeal and incorporeal alchemy can also refer to cementation methods (powders) as opposed to distillation (vapors, "spirits").

(false) belief that daemons govern natural forces, or can override them, seems to be a target of Zosimus's critiques of "unnatural" forms of astrology and alchemy.

Zosimus's emphasis on spiritual ascent and divine revelation as a superior means of understanding nature is not found in *Isis to Horus*, but these themes do appear in *Book of Enoch*. After Enoch hears the myth of the fallen angels, and how daemonic revelations of nature and technology lead to sin and wickedness, Enoch is then taken to heaven, where he witnesses the punishment of the fallen angels, and the divine majesty of God's creation is revealed to him. Nature and divine power are dominant themes in this text, and, as Martha Himmelfarb has phrased it, nature "serves as testimony to God's greatness and to the order of the universe."[59] This is evident in the homily on nature that immediately precedes the myth of the fallen angels, in which contemplation of God's creation is encouraged as a sort of spiritual exercise:

> Consider all [his works] and observe the works (of creation) in heaven, how the heavenly luminaries do not change their paths in the conjunction of their orbits, how each of them rises and sets in order, at its appointed time, and at their fixed seasons they appear, and do not violate their proper order…..
>
> Consider all trees; in all of them green leafage appears and covers them; and all their fruit appears in glorious splendor. Examine and consider all these works (of creation) and reflect that the God who lives forever and ever has created all these works. And all his works which he has made forever attend on him year by year; and all his works serve him and do not change, but all perform his commands.[60]

The stability and reliability of the natural order are emphasized, along with the notion that God controls and directs the course of nature. The governing forces of the universe, particularly the role of Fate, were a topic of much philosophical debate in

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[59] See Martha Himmelfarb's discussion of the theme of nature in the *Book of Enoch* and other Jewish apocalyptic texts, in *Ascent to Heaven in Jewish and Christian Apocalypses* (New York: Oxford University Press, 1993), Ch. 4; quotation is from p. 72.

[60] *1 Enoch* 2:1 and 5:1-2, trans. M. Black. See also my previous discussion, in Ch. 2, of the contemplation of nature as a spiritual exercise.

antiquity. The *Book of Enoch* presents a biblical view of God's omnipotence in the context of these wider debates, stressing that God alone governs the universe, and that the natural order, which never strays from God's will, is a model for moral order.

In the Enochian fallen angels myth, divine revelation is contrasted with daemonic revelation as a source of knowledge of nature. The "magical" arts taught by the fallen angels—astrology, botanical medicines, and auguries of natural omens—are all sciences of nature, but this knowledge is portrayed as improper and "unnatural" because it comes from angels who have transgressed the natural order by mating with human women. The critiques against these "magical" sciences are leveled at practitioners who believe that daemonic powers will grant them knowledge of nature. They err in their failure to recognize that God alone is the master of nature.

The metallurgical and tinctorial arts seem to be placed in a different class than the magical arts. These technologies are associated with weaponry, but greater emphasis is placed on the "varieties of adornment" produced by these technologies, such as cosmetics, jewelry, and colorful dyes, which are condemned because they perpetuate vanity and lust. In Greek, the word *kosmos* can mean "universe" as well as "adornment," and this dual meaning seems to be operating in this text.[61] Adornment and vanity signify a superficial orientation toward the world, in which the artificial beauty created by humans (with the help of daemons) is glorified to a greater degree than God's majesty and his wondrous creation.[62]

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[61] *1 Enoch* was originally written in Aramaic and translated into several languages, including Greek and the Ethiopian version which I am citing here. The Ethiopian word for "world" appears to be synonymous with adornment, as it is in Greek, because scholars have translated the Ethiopian phrase *tawaleto 'alam* as both "transmutation of the world" and "varieties of adornment." See n. 49 above.

[62] In Hellenistic philosophy, particularly in Platonic thought, artifice is often opposed to divine creation.

This critique of metallurgy and the tinctorial arts in *Book of Enoch* was undoubtedly one of the reasons this work became influential among alchemists, though neither Zosimus nor the author of *Isis to Horus* respond to its charge that their arts lead to vanity. Instead, they both address the Enochian claim that their arts are revealed by daemons. The author of *Isis to Horus* responds by portraying Isis as a victor over the daemons' lust, and therefore her methods of obtaining alchemical wisdom are in accordance with the natural order (like begets like). Zosimus, whose theories of nature and divine power are similar to those expressed in the *Book of Enoch*, uses the fallen angels myth as a polemic against his competitors, who wish to seduce Theosebia with their false teachings. His approval of the ancient books of *Chema*, which were allegedly revealed by the fallen angels, makes sense in light of the Hermetic re-working of the Enochian myth. He can condone these books because according to Egyptian alchemical tradition, Isis acquired this knowledge through her use of natural methods. But given Zosimus's great esteem for the science and wisdom of Jewish metallurgists, it may also be a sign of respect that he attributes the first book on alchemy to the Jews.

The Anthropos, or Primal Human

I have shown how Zosimus uses certain themes from Jewish texts, which were influential amongst early alchemists, to argue against the "unnatural" methods of his competitors, which are based on daemonic revelation. In this last example, taken from Zosimus's *On Apparatus and Furnaces (Letter Omega)*, I will discuss Zosimus use of "gnostic" teachings on the Anthropos, or primal human, which he uses to instruct Theosebia on the difference between corporeal and incorporeal knowledge, and how

each is obtained.[63] He draws upon Hermetic and gnostic myths, as well as Hesiod's myth of Prometheus and Epimetheus, in order to present a "universal" doctrine of the Anthropos, but he focuses particularly on gnostic versions of this myth. Though Christian themes figure prominently in his discussions, Zosimus always refers to these ideas as "Jewish" or "Hebrew," never as Christian.[64] This designation appears to be related to his portrayal of these beliefs as the "ancient" wisdom of Jewish metallurgical traditions.

Zosimus opens *On Apparatus and Furnaces* with a discussion of how his competitors have been ridiculing an old alchemical book that he holds in high regard.[65] This book likely contained "natural" astrological methods for preparing tinctures, because Zosimus in turn ridicules his rivals for using a daemonic form of astrology in their alchemical operations. He says that their formulas—by which he probably means tables for determining the propitious appearances of daemons—yield inconsistent results, and when their operations fail, they admit there might be some truth to the older methods (i.e., those respected by Zosimus), but when they succeed, they forget "the former clear proofs" and credit their daemons for granting them success.[66] These

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[63] "Gnosticism" is a problematic category for several reasons, including its use as an umbrella term to describe a broad range of ideas (including Hermetic thought). Neither Hermetism nor Jewish/Christian gnosticism should be understood as uniform doctrines. For a fuller treatment of the problematic category of "gnosticism," see Michael Williams, *Rethinking "Gnosticism": An Argument for Dismantling a Dubious Category* (Princeton: Princeton University Press, 1996); and Karen King, *What is Gnosticism?* (Cambridge: Belknap Press of Harvard University Press, 2003). See also Garth Fowden, *The Egyptian Hermes* (esp. Ch.1), and Brian Copenhaver's introduction to *Hermetica*, for discussions of the diverse doctrines within Hermetic literature and problems with categorization.

[64] There are gnostic texts which appear to be of Jewish origin and make no mention of Christ, whereas others are clearly Christian, and still others in which Jesus is mentioned, but plays a minor role. I will not attempt here to identify which types of gnosticism Zosimus is identifying with, but rather how he presents his own version of gnostic ideas.

[65] This book is called *On Furnaces and Apparatus*, but it is not the same as Zosimus's similarly titled text.

[66] *On Apparatus and Furnaces*, section 3, trans. H. Jackson. All citations from this text are from Jackson's translation, unless otherwise noted.

alchemists, he says, are driven by Fate. Their personalities are as inconstant as the daemons, who, as they are "transformed in the course of the changing times of their fate," are beneficent one moment and maleficent the next.[67] Such men, he writes to Theosebia, have "no conception of anything incorporeal, and…no understanding of Fate herself, who conducts them justly. Instead they insult the instruction she gives through corporeal experience, and imagine nothing beyond the good fortune she grants."[68]

Zosimus then proceeds to tell Theosebia a story about the Anthropos, in which he upholds the primal human, who is a divine mediator between heaven and earth, in contradistinction to the daemonic mediators invoked by his rivals. Myths of the Anthropos are found in several Hermetic and gnostic texts.[69] This literature is quite diverse, and therefore there are differences in the way the primal human is conceived, but he is typically portrayed as a divinely created entity, the "Son of God," or "Son of Man," who is created in God's image and becomes the archetypal model for the creation of human beings. In some versions of the story, including the one presented by Zosimus, the primal human falls into matter, and thus becomes associated with the spiritual principle concealed within nature, and with the divine spirit (or divine image) trapped within the human body.[70] The Anthropos also has a soteriological function in

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[67] Ibid., section 2.
[68] Ibid., 4.
[69] The Anthropos also figures prominently in Manichean literature, but Zosimus is drawing particularly on Hermetic and gnostic versions of the myth. Examples of these myths can be found in the Hermetic texts, *CH* I (i.e., *Poimandres*, which contains the most detailed account of the Anthropos), and *CH* VIII; and in the gnostic texts, *On the Origin of the World* (*NHC* II, 5), and *Apocryphon of John* (*NHC* II, 1). This is by no means a comprehensive list.
[70] For detailed comparisons of the Anthropos myth in Hermetic and gnostic literature, see Jonathan Peste, "The Poimandres Group in Corpus Hermeticum: Myth, Mysticism and Gnosis in Late Antiquity" (Ph.D. diss., University of Göteborg, 2002). See also Kurt Rudolph's summary of the basic features of

that he bestows spiritual knowledge upon creation, which enables humans to return to their divine source. The various emanations of the Anthropos as he appears in the divine and cosmic realms can be seen as series of sympathetic links that unite the human spirit with the divine.[71]

Zosimus explains that the doctrine of the primal human is known to many cultures: the Egyptians call him Thoth, the "interpreter of all things," and the Jews, Chaldeans, and other Near Eastern peoples call him Adam, or "earth."[72] Thoth and Adam are the names of the "man of flesh," but the Anthropos is also composed of an inner "man of spirit," whose name is Phōs, or light.[73] Zosimus reads Hesiod's myth of Prometheus and Epimetheus as the Greek version of the Anthropos myth.[74] He identifies the spiritual man with Prometheus, who brought heavenly fire to humankind and warned his brother Epimetheus not to accept the gifts of Zeus, or Fate.[75] Epimetheus, who accepts Fate's gift of Pandora, and thus indirectly brings evil into the world, is the man of flesh. Zosimus says that "by the allegorical method," Prometheus and Epimetheus are to be understood as "a single man, that is, soul and body."[76]

Anthropos myths, in *Gnosis: The Nature and History of Gnosticism* (San Francisco: HarperSanFrancisco, 1987), 92-94.

[71] The emanations of the Anthropos are specifically described as sympathetic links in Hermetic texts, for example, in *CH* VIII: "According to the father's will, and unlike other living things on earth, mankind, the third living thing, came to be in the image of the cosmos, possessing mind as well as a relation not only of sympathy with the second god but also of thought with the first god." Trans. B. Copenhaver.

[72] *On Apparatus and Furnaces*, 8. Zosimus lists several etymological renderings of the name Adam, including "blood-red earth," and "fiery earth." Of course, in Genesis, Adam is also an "interpreter of all things" in that he names all the living creatures.

[73] Ibid., 10. Zosimus uses the more gender-neutral term "*anthrōpos*" when referring to the beings of flesh and spirit, but Jackson translates this as "man." Since Zosimus uses male figures as representatives of the various manifestations of the Anthropos, I will follow Jackson's translation in order to avoid confusion and cumbersome prose.

[74] Hesiod's *Theogony* and *Works and Days* contain the earliest extant versions of the Prometheus and Epimetheus myth. In later versions, Prometheus and Epimetheus are said to be the creators of humankind, and their stories become more assimilated with themes in Genesis. Prometheus's son, Deucalion, is identified with Noah, for example.

[75] Zosimus explicitly identifies Zeus with Fate. See *On Apparatus and Furnaces*, 6.

[76] Ibid., 12.

Zosimus gives a "Hebrew" account of how the man of spirit became flesh. In the Garden of Eden, Phōs, who was "innocent and unactivated," was persuaded by the agents of Fate to "clothe himself with their Adam, who comes from Fate."[77] The sinister agents of Fate rejoiced that they had deceived Phōs and enslaved him. A similar theme is found in several "gnostic" texts, where Adam's body is created by the cosmic creator and his minions, the planetary archons, but Adam's spirit is created by a divine source. The notion of two different creators for the spirit and body of the Anthropos, one good and one evil, is not found in Hermetic literature, and Zosimus apparently uses the "gnostic" version to underscore the difference between corporeal and incorporeal knowledge, since he plays upon the distinction between flesh and spirit throughout the text.[78]

Zosimus refers to the man of spirit in Hermetic terms as the Son of God, one of the divine beings of the "ineffable Triad."[79] In Hermetic thought, the divine is often conceived as a trinity consisting of the divine Father and his two "sons," Mind and *Logos* (also called Will).[80] Mind and *Logos* are understood as aspects of the one ineffable God, but they are also personified as distinct entities with their own specific,

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[77] Ibid., 11.

[78] In Hermetic literature it is strongly emphasized that God is the sole creator. See, for example, *CH* XI, in which debates about two creators are addressed, and it is insisted that there is only one creator: "Clearly, there is someone who makes these things, and quite evidently he is one, for soul is one, life is one and matter is one. But who is this someone? Who else but the one god? To whom, if not to god alone, might it belong to make ensouled living beings? God is one, then. {How entirely absurd!} Since you have agreed that the cosmos is always one, that the sun is one, the moon one and divinity one, do you propose to number god himself among them?" Trans. B. Copenhaver.

[79] *On Apparatus and Furnaces*, 7

[80] My account of Hermetic notions of the trinity is largely taken from *Poimandres* (*CH* I), a text which Zosimus was familiar with, but these trinitarian ideas can be found in several Hermetic texts. See also J. Peste's discussions of these divine entities in "The Poimandres Group in Corpus Hermeticum," 49-54. H. Jackson also discusses the Hermetic trinity, but I do not fully agree with his interpretations. He speculates that the trinity consists of the Father, Logos, and either the material cosmos or man possessing mind, and therefore overlooks the Demiurge, or the second Mind. As Jackson notes, there are many triads in Hermetic literature, and this can result in confusion. See *Zosimos of Panopolis on the Letter Omega,* 44-45, nn. 26-27 and 30.

yet interrelated, functions. Mind (also called the second Mind) is the Demiurge, who creates the cosmic framework and the seven planets that govern the cosmos; the planetary government is called Fate. The third aspect of the trinity, *Logos*, also called the Son of God, is the will and word of God; he is a co-creator of the cosmos, and the divine presence within nature. The Son of God is also the Anthropos, the divine being who becomes flesh, and the savior who awakens humans to their divine nature.

Zosimus presents the following Hermetic view of the Son of God as a savior figure:

> [S]ee the Son of God become everything for the sake of holy souls, to draw her up out of the realm of Fate into the realm of the incorporeal. See him become everything! –god, messenger, passible man; for, being capable of everything, he becomes everything he so wills and obeys the Father by pervading every body. He enlightens the mind of each soul and spurs it on up to the realm of bliss, where it was even before it was born into corporeality, following after him, and filled with yearning by him, and guided by him into that light.[81]

The Son of God, who is the personification of divine will, has the qualities of omnipresence and also the ability to appear at will. Zosimus associates this aspect of the Hermetic trinity with Jesus Christ. Like the Hermetic Son of God, Jesus is a divine savior who has the ability to appear whenever and to whomever he wills, and to take on different forms:

> Jesus Christ drew nigh to Adam and bore him up to the place where those named *phōtes* dwelt before. And he also appeared to very powerless men by becoming a man who suffered and was subjected to blows. And he secretly carried off as his spoil the *phōtes*, who belong to him, because he suffered nothing but instead showed death trampled under foot and thrust aside. And both now and until the end of the world he comes, both secretly and openly, to his own and communes with them by counseling them secretly and through their minds to get rid of their Adam.[82]

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[81] *On Apparatus and Furnaces,* 7.

[82] Ibid.,13. In *On Electrum*, Zosimus refers to the Son of God as the "Holy Spirit," and "the Word," which underscores the conceptual and terminological slippage between Hermetic and Christian notions of the Trinity. See *CMA*, Syr. II.12.3-4.

At first glance, Zosimus seems to be giving a docetic account of Jesus, in which Christ only *appears* as a man of flesh and does not actually suffer at the hands of man. Gnostic Christologies are often noted for their docetic doctrines, which have been (problematically) used to support claims that gnostic teachings are radically dualistic and utterly devalue the cosmos and the flesh.[83] But elsewhere Zosimus says that the man of light (Prometheus, in this case) appears as body, mind, and soul.[84] Likewise, the Hermetic Son of God is said to pervade all bodies. The appearance of the Son of God in the material realm, or in physical form, does not diminish the divine in any way. Zosimus *does* make sharp distinctions between the flesh and the spirit in this text, but it is not his intention to denigrate the physical world, which he believes is essentially divine. In antiquity, the terms "flesh" and "spirit" were used to signify spiritual ignorance (or worldliness) and spiritual wisdom, and this is the sense in which Zosimus is using them. His emphasis on the manifold appearances of the spiritual man is meant to show that the divine is omnipresent, but that this is only *apparent* to those who are spiritually aware. Zosimus calls those who are saved by Jesus Christ "*phōtes*"; they are enlightened human beings who recognize their true spiritual nature and have shed their "Adam," or their ignorance. They have transcended Fate, and therefore death, by realizing the immortal spirit within. Zosimus indicates that this spiritual knowledge is available to all humans who make the effort to understand their divine nature, because he says that Epimetheus, the man of flesh, had a "change of mind" and became enlightened, and that he "explains all…for those who have ears of the mind. But those

[83] On the problematics of docetism in interpretations of gnostic theologies, see King, *What is Gnosticism?*, 208-213, and Williams, *Rethinking "Gnosticism,"* 126.
[84] *On Apparatus and Furnaces,* 12.

who have only bodily ears belong to Fate, for they neither grasp nor confess anything else."[85]

Zosimus contrasts the Son of God with the Mimic Daemon (*antimimos daimōn*), who guides the "Adams," the men of flesh.[86] The Mimic, who blasphemously calls himself the Son of God, has an ugly body as well as an ugly soul; he is jealous of the men of light and wishes to deceive them.[87] As Howard Jackson notes, the Mimic resembles the "gnostic" Demiurge, the cosmic creator who is often portrayed as ugly and ignorant or jealous of the spiritual realities above.[88] But given that Zosimus views the Demiurge as the Mind of God, and as one of the holy trinity, it is certainly not his intention to associate the Mimic with the Demiurge. In Zosimus's myth, the Mimic is not described as the creator of the world, but rather as one who has not yet appeared; therefore, the Mimic is more comparable to the Antichrist.[89] Zosimus says that before the Mimic Daemon appears, he will send a forerunner, who tells "fabulous, deceptive tales and lead[s] men on about Fate."[90] Similar predictions, that forerunners of the Antichrist will appear and deceive the people with false teachings, are found in the New Testament.[91] Zosimus does not say what will happen when the Mimic Daemon comes. His point is that the "men of flesh" (namely his competitors, who know only

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[85] Ibid., 16.
[86] The concept of a Mimic Daemon is not found in the extant Hermetic literature.
[87] *On Apparatus and Furnaces*, 14.
[88] Jackson, *Zosimos of Panopolis on the Letter Omega*, 53, n. 67. See also Mertens, *Zosime de Panopolis: Mémoires Authentiques*, 104-106, n. 89. Jackson and Mertens both note that in the gnostic texts *Apocryphon of John* (*NHC* II, 1) and *Pistis Sophia*, there is mention of a "counterfeit spirit" created by the cosmic rulers (i.e., the Demiurge and the planetary archons), which they impart to humans in order to keep them ignorant of divine reality. The ignorance and false guidance of the counterfeit spirit is also a feature of Zosimus's text, and he is probably familiar with these gnostic ideas, but he uses them in a way that does not conflict with Hermetic beliefs.
[89] This is also Festugière's assessment. See *La Révélation d'Hermès Trismégiste* Vol. I, 271, n. 3.
[90] *On Apparatus and Furnaces*, 14.
[91] See, for example, Mark 13, 2 Thess 2, and Rev 13. For additional references, see Jackson, 55, n. 75.

Fate) are guided by daemons and deceived by false teachings, whereas the "men of light" are guided by the Son of God.

Though Zosimus opposes the man of spirit and the man of flesh, he is also careful to note that they are one being, the body and soul of every human. The cosmic struggle of good and evil forces is essentially a contest of wisdom and ignorance. The message of Zosimus's Anthropos myth is that people must activate the "man of light" within and overcome the deceptions of Fate, which keep them ignorant of their true spiritual nature. He also intends this as a lesson in cosmic sympathy.[92] The human spirit is sympathetically linked to the Son of God because the human spirit contains his divine image. The Son of God is also the divine presence within nature, and Zosimus believes that by contemplating the natural order, or God's will manifest in creation, one can penetrate the mysteries of creation.[93] By contrast, the Mimic Daemon is sympathetically linked to the daemons, the ambivalent powers of Fate, and to ignorance. Daemonic methods of cosmic sympathy yield false understandings of the cosmos, in Zosimus's opinion, and this includes the notion that the cosmos is ruled by Fate. He believes that it is a mistake to think that the world is solely governed by Fate and its daemonic agents, because the divine presence, which is all-powerful, is everywhere. Fate is the guide of the ignorant "men of flesh," whereas the "men of light," who are spiritually aware, perceive Fate in another way, as divine providence revealed in the natural order.

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[92] This is reinforced by his demonstration of how the letters of the name Adam correspond to the cardinal directions, and that by tracing a series of divine signatures, or sympathies, one can perceive the divine presence within self and cosmos. See my previous discussion of this passage in Ch. 2

[93] This is a prominent theme in Hermetic literature.

In conclusion, Zosimus thinks highly of Jewish metallurgical techniques, namely distillation, as well as Jewish and "gnostic" religious ideas, and he incorporates them into his alchemical theory and practice. Unfortunately, in the extant writings of Zosimus, he does not give any clues as to his social involvement with Jewish metallurgists (he only refers to their texts and tradition), but I suspect that he and Theosebia may have had colleagues and students who were Jewish and Christian. In several of his treatises, he refers to the Egyptians and the Jews as the two great traditions of metallurgy and attempts to show that their techniques and their religious ideas are in agreement. This implies that he was either engaged in or interested in forging alliances with Jewish metallurgists.

Zosimus also provides evidence that Egyptian metallurgists had incorporated themes from Jewish apocryphal literature into their alchemical writings. As I have shown, Zosimus uses these Jewish (and Christian) themes—Solomon's exorcisms, the Enochian myth of the fallen angels, and "gnostic" teachings of the Anthropos—to illustrate the differences between natural and unnatural approaches to alchemy. His polemics are directed, in part, at astrological methods, but as I have argued, his criticisms of "unnatural" methods are not limited to astrology, but reveal broader cultural debates over daemonic and divine forms of revelation, and different theories of nature and cosmic sympathy, Fate, and divine power.

CHAPTER FOUR:

ALCHEMY, THEURGY, AND THE DIVINE COSMOS

Alchemy and theurgy have long been considered to be compatible practices, and they are frequently associated with magic and esotericism, both in a positive and a negative sense. Numerous modern-day ceremonial magicians, pagans, and "new age" thinkers embrace alchemy and theurgy as part of their spiritual heritage.[1] Scholar Antoine Faivre also views alchemy and theurgy as important currents of Western esoteric thought, and he classifies them as forms of "white magic."[2] Other scholars have been less sympathetic, however, and have referred to alchemy and theurgy as "irrational," "bizarre," and "obscurantist" magico-religious practices that contributed to the decline of rational science and philosophy in late antiquity.[3]

In recent years, scholars have noted that Zosimean alchemy has theurgical qualities, though no one has elaborated on this.[4] I aim to fill this gap by comparing

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[1] A simple Internet search on "alchemy and theurgy" reveals numerous examples of this. As Gregory Shaw has noted, ceremonial magicians (he cites the late Israel Regardie, who was affiliated with the Golden Dawn) often associate their practices with theurgy. See Shaw, "Theurgy: Rituals of Unification in the Neoplatonism of Iamblichus," *Traditio* 41 (1985): 4. Alchemy, too, is often embraced by many contemporary "esotericists."

[2] Faivre, *Access to Western Esotericism*, 36.

[3] E.R. Dodds, for example, considers theurgy to be a branch of magic, and he calls it a "bizarre" and "irrational" practice. He also notes that Arabic alchemists (namely the eighth-century alchemist Jabir, better known as Geber) derived some of their concepts from theurgical rites. See Dodds, *Greeks and the Irrational*, Appendix II, 284, 287, and 295. Samuel Sambursky, in his work on late ancient science, says that this period is characterized by "obscurantist" tendencies, and that alchemy and theurgy are part of this current, but he concedes that in this "strange mental climate," so-called irrational thinkers like Iamblichus—the Neoplatonist philosopher and theurgist whom I will be discussing—display what appears to be a "split personality" and actually have brilliant scientific insights. Sambursky highly praises Iamblichus's abilities as a mathematical theorist, and he wrongly claims that Iamblichus was also a practicing alchemist. Though there is an alchemical text attributed to Iamblichus in the Greco-Egyptian alchemical literature (*CAG* IV.19), Sambursky does not take into account the alchemical tradition of pseudonymous authorship. See Sambursky, *The Physical World of Late Antiquity* (Princeton: Princeton University Press) 47, 59.

[4] Garth Fowden notes that there are similarities between Zosimus's allegory, *On Excellence*, and Iamblichean theurgy, and suggests this as an area for further study. See Fowden, *The Egyptian Hermes*, 153, n. 43. In his article, "Unpropitious Tinctures: Alchemy, Astrology and Gnosis According to

aspects of Zosimean alchemy to theurgical concepts outlined by Iamblichus, who was Zosimus's contemporary.[5] My overarching purpose is twofold: one is to demonstrate that Zosimus was aligned with current trends in Neoplatonism, the preeminent philosophy of his day; the other is to provide a model for comparing alchemy and theurgy that makes use of particular examples within their specific historical and cultural contexts. Such contextual comparisons are necessary given that alchemy and theurgy are typically associated in a very general sense, which does not account for the changes that occurred over centuries of practice. I will be arguing that Zosimean alchemy *is* a type of theurgy, but I would also like to stress that neither Zosimus nor Iamblichus would consider their practices to be magic, though alchemists, theurgists, and "esotericists" in different times and places might use "magic" as a self-descriptive label.

Theurgy (*theourgos*), which means "work of the gods" or "divine work," is a term used by late ancient writers to denote ritual techniques for purifying and elevating the soul. The term first appeared in the *Chaldean Oracles*, a collection of verses from the late second century CE that were allegedly transmitted by the gods to Julian the Chaldean and his son, Julian the Theurgist.[6] The *Oracles* became immensely popular

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Zosimos of Panopolis," Daniel Stolzenberg claims that Zosimean alchemy is a type of "Gnostic theurgy," 4, 29-31. Kyle Fraser also suggests that Zosimean alchemy is a form of late ancient theurgy in "Zosimos of Panopolis and the Book of Enoch: Alchemy as Forbidden Knowledge," 131, n. 22.

[5] Iamblichus died around 325 CE, and Zosimus probably flourished around 300 CE. For issues regarding the dating of Iamblichus and his work, see the introduction to *Iamblichus*: De Mysteriis, trans. and ed. Emma Clarke, John Dillon, and Jackson Hershbell (Atlanta: Society of Biblical Literature, 2003), xviii-xxiv. Unless otherwise noted, all quotations from Iamblichus's surviving work on theurgy, *De Mysteriis* (abbreviated *DM*), are from this translation, which is based on the Budé edition of Édouard Des Places.

[6] See Ruth Majercik, *The Chaldean Oracles: Text, Translation, and Commentary* (Leiden: Brill, 1989), 1-3. The two Julians also wrote works on theurgic rituals, daemons, and the planetary zones—none of which have survived. The Chaldean Oracles only survive in fragments, and most of these are gathered from citations found in Neoplatonic works. For further information on Chaldean theurgy, see also Hans Lewy, *Chaldean Oracles and Theurgy* (Paris: Augustinian Studies, 1978), and Sarah Iles Johnston,

with Neoplatonists. As Ruth Majercik writes, "the *Oracles* were regarded by the later Neoplatonists—from Porphyry to Damascius—as authoritative revelatory literature equal in importance only to Plato's *Timaeus*."[7] Porphyry was the first to write a commentary on the *Oracles* and evaluate the efficacy of theurgic rites, but his student Iamblichus expanded theurgy beyond its original scope and developed it into a full-fledged Neoplatonic cult.[8]

Iamblichus's notions of theurgy include a variety of activities that are oriented toward salvific goals. He differs from his predecessors in this regard. Porphyry, for example, differentiates between ritual-oriented theurgy and philosophic contemplation of the divine, whereas Iamblichus considers both ritual and contemplation to be forms of theurgy, the latter being the highest form.[9] Since Zosimus tends to promote contemplative exercises, and since the technical aspects of alchemy should not be reduced to ritual praxis (though there is indeed some overlap in Zosimus's case), Iamblichus's broader notions of theurgy can be applied more readily to Zosimean alchemy.[10] There are further examples of why this is so. As Gregory Shaw has argued, Iamblichus, who was a Pythagorean, considered the contemplation of numbers

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Hekate Soteria: A Study of Hekate's Roles in the Chaldean Oracles and Related Literature (Atlanta: Scholars Press, 1990).

[7] Majercik, *The Chaldean Oracles*, 2. She also notes that Franz Cumont was the first to refer to the *Oracles* as the "Bible of the Neoplatonists."

[8] For a comparison of Chaldean and Iamblichean theurgy, see Johnston, *Hekate Soteria*, ch. 6.

[9] See Augustine's discussion of Porphyry's opinions of theurgy in *City of God,* X.9; and Iamblichus's description of various types of theurgy, which includes contemplation, in *DM* V.18-19.

[10] Naomi Janowitz has recently portrayed Greco-Egyptian alchemy as a ritual practice, and in doing so she recapitulates the views of earlier scholars that alchemy had little to do with real chemistry or metallurgy, and that alchemy originated because people found mystical significance in chemical symbolism and created a religious practice from this. For example, Janowitz says that alchemy is best understood as "the harnessing of Late Antique *technai* for religious goals," and that it originated when "religious thinkers attempted to co-opt, for their own quite distinct purposes, the prestige and success of the most up-to-date metal arts available." She also refers to standard craft procedures like the *kerotakis* process as "ritual techniques," thereby reducing all craftsmanship to ritual performance. I think that this depiction of ancient alchemy is inaccurate. See Janowitz, *Icons of Power: Ritual Practices in Late Antiquity*, 111, 114.

to be theurgical because this activity orients the soul toward the divine structure and harmony of the universe.[11] Since Iamblichus views this spiritual approach to mathematics as a form of theurgy, then it is likely that he would have considered Zosimus's approach to alchemy to be theurgical as well. Furthermore, Iamblichus frames theurgy as the ancient wisdom of Egyptian priests and frequently draws upon Hermetic philosophy to explain theurgical concepts.[12] He claims that Egyptian priests recommend theurgy as a means of ascending to the creator god, and that they often practice this sacred art by simply observing the "critical time for action."[13] This hieratic art makes use of astronomical calculations and observances to determine proper times for cultic activities. Zosimus, an Egyptian priest, was trained in this art, and it is the foundation of his "natural" alchemical methods: he frequently contrasts the "timely tinctures" he produces in accordance with natural rhythms with the "unnatural" methods of his competitors, who summon demons to assist with their tinctures. Given these points of convergence, I contend that Zosimean alchemy can be considered a form of theurgy according to the wider parameters set by Iamblichus.

Gregory Shaw argues that Iamblichean theurgy is a demiurgical practice: the theurgist imitates the Demiurge, who created an orderly universe out of chaos, by

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[11] See Shaw, "The Geometry of Grace: A Pythagorean Approach to Theurgy," in *The Divine Iamblichus*, ed. Blumenthal and Clark, 125-130; and Shaw, *Theurgy and the Soul*, chs. 18 and 19. Porphyry, on the other hand, considered Pythagorean contemplation of numbers to be a form of "intellectual sacrifice" or philosophic contemplation, and therefore non-theurgical. See Porphyry, *On Abstinence from Killing Animals*, 2.36.

[12] Iamblichus wrote *De Mysteriis* in the guise of a Hermetic priest named Abamon. See Gregory Shaw's discussion of the Egyptian elements of Iamblichean theurgy in *Theurgy and the Soul: The Neoplatonism of Iamblichus*, 21-23. Iamblichus also claims that other ancient Near Eastern cultures practiced theurgy – namely the Chaldeans and Assyrians, though he mentions these cultures less frequently than the Egyptians.

[13] *DM* VIII.4.267.

creating an orderly soul out of the chaos of its embodied existence.[14] Zosimean alchemy is also demiurgical. Iamblichus and Zosimus both adhere to Plato's doctrine (also prominent in Hermetic thought) that the cosmogonic will of the Demiurge is made manifest in the physical universe, and fulfilled when human souls return to their divine source: the natural world and the divine powers that create and sustain the world provide the very model of order and stability that the soul must emulate in order to ascend.[15] The divine work of theurgy is to bring the soul into harmony with the divine cosmic order so that it may attain union with Demiurge (*nous*) and fully experience the unity of all things.[16]

This comparison of Zosimus and Iamblichus will focus primarily on their views of nature and the divine and the ways in which their practices integrate the material and spiritual worlds. But given that alchemy and theurgy have been cited as examples of

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[14] See Shaw, *Theurgy and the Soul*, 15 and ch. 4. My reading of Iamblichus is strongly influenced by Shaw's work. Other scholars tend to focus more on the ritual aspects of theurgy. For example, Emma Clarke, in her recent work on Iamblichean theurgy, defines theurgy as "religious ritual demonstrating supernatural power," and portrays Iamblichus as a defender of the "miraculous." Though Clarke adds that Iamblichus's belief in the supernatural is not incompatible with a belief in a divinely ordered cosmos, in my opinion she and other scholars tend to overemphasize the "supernatural" elements and gloss over the continuities between nature and the divine that are fundamental to Iamblichus's philosophy. See Clarke, *Iamblichus'* De Mysteriis: *A Manifesto of the Miraculous* (Aldershot: Ashgate, 2001). Quotations are from pages 19 and 2, respectively. See also her discussion of Iamblichus's use of the terms natural and supernatural on pp. 19-24.

[15] See Plato, *Timaeus* 42b-d, 90d. Iamblichus notes that the Demiurge "sent down souls for this purpose, that they should return to him again," in *DM* VIII.8; in *DM* V.20 he explains that the natural order of the cosmos provides a "mode of access" to divine principles on which theurgic rites should be based. Hermetic views of creation and salvation are deeply inspired by Plato's *Timaeus*, and the idea that humans should contemplate and emulate the natural order in order to know god is found throughout the philosophical *Hermetica*.

[16] Iamblichus held that there were two Demiurges: the cosmic creator, and the pre-essential Demiurge who is the "god of gods" and the "first principle of the intelligible realm" (*DM* VIII.2.262). The One is the highest principle, but it is entirely transcendent and ineffable, and therefore beyond the reach of the soul. See Shaw's discussion in *Theurgy and the Soul*, 113; and John Dillon's outline of Iamblichean metaphysics in *Iamblichi Chalcidensis in Platonis dialogos commentariorum fragmenta*, ed. and trans. John M. Dillon (Leiden: E.J. Brill, 1973), 29-39.

There is a similar notion of two Demiurges in Hermetic thought: the father god is called Mind, and the cosmic creator is called the second Mind. As I explained in Chapter Three, Zosimus understands the highest divine powers as a trinity consisting of the father god, who is the source of all, and his "sons," the Demiurge and the Holy Spirit, who are the Mind and the Will of the father god and are responsible for the creation of the universe.

intellectual decline in late antiquity, I will also focus on points on which Zosimus and Iamblichus have been deemed "irrational." First I will look at their views of magic and human rationality, and how they contrast these "cosmic" forms of knowledge with theurgic revelation. Next, I will examine their notions of the gods as creative forces of nature, their use of natural objects as divine signatures, and their views of cosmic sympathy, which, I shall argue, are somewhat atypical for their era. The works of Zosimus and Iamblichus also exemplify the fusion of science and religion that was occurring in late antiquity, and I will end by discussing Pythagorean mathematics as a point of comparison for Zosimus's spiritual approach to alchemy, and show how religious and scientific goals are fused and embodied in the figures of the Hermetic and Pythagorean sage.

"Cosmic" knowledge vs. theurgical knowledge

Zosimus and Iamblichus are careful to distinguish their beliefs and practices from those that are merely "cosmic" in orientation. Cosmic knowledge can signify many things, but these authors most often use this trope to indicate superficial, limited, or false understandings of divine reality. This language is not meant to degrade the cosmos, which they believe is essentially divine; rather, it reflects their notions of spiritual ascent, in which divine reality is topographically imagined as being beyond the realm of the fixed stars; below this cosmic boundary is the realm of Fate, which signifies the spiritual ignorance from which the soul must be liberated. I will examine two specific forms of cosmic knowledge here—magic and rationality—because the ways in which Zosimus and Iamblichus critique these forms of knowledge helps to clarify their insistence upon divine revelation, divine causation, and the divine essence

of the cosmos. I will argue that magic and rationality are both designated as forms of "cosmic" knowledge because in both cases, human power is either confused with or given priority over divine power.

In late antiquity magic was often associated with attempts to coerce the gods and other cosmic powers. Zosimus and Iamblichus both conceive of magic in this way. "[T]he spiritual man," Zosimus writes, "need not rectify anything through the use of magic, not even if it is considered a good thing, nor must he use force upon Necessity [Fate], but rather allow Necessity to work in accordance with her own nature and decree."[17] As Emma Clarke explains, Iamblichus's problem with magicians is that they work solely within the cosmic realm and attempt to manipulate and command the cosmic gods and powers, whereas theurgists try to understand how these powers are divinely generated.[18] In both cases, the magical manipulation of divine powers is contrasted with the theurgical effort to understand and work in harmony with these powers. Both Zosimus and Iamblichus agree that if one has a proper understanding of the divine cosmic order, one will be able to transcend it.

Magicians who attempt to command the gods have grossly overestimated their own power. They are ignorant of their place in the divine cosmic order because they falsely believe that they can control the gods, who are far more powerful than humans. Iamblichus explains that divine manifestations brought about by magic are only illusions. He warns that one should not compare "the clearest visions of the gods to the images produced artificially from magic, for these have neither the energy, nor the essence of things seen, nor truth, but present mere images, reaching only as far as

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[17] *On Apparatus and Furnaces* 7, trans. H. Jackson, in *Zosimos of Panopolis on the Letter Omega*.
[18] Emma Clarke, *Iamblichus'* De Mysteriis: *A Manifesto of the Miraculous*, 21-22.

appearance."[19] He likens these artificial images to hallucinations that one experiences during a fever or illness; these are products of the (unhealthy) human imagination, and they have absolutely nothing in common with divine visions.[20] The work of theurgy is not to act upon the gods, but rather to experience the divine acting within the human, and within the world.

Zosimus and Iamblichus make similar distinctions between human and divine causality in their critiques of rationalism, which they deem as another type of "cosmic" knowledge. This can be seen in Iamblichus's *De Mysteriis*, which is a response to criticisms of theurgy raised by Porphyry, who, in Gregory Shaw's words, thought that theurgy was "merely a *technē* for the philosophically immature."[21] Iamblichus disagrees with Porphyry's sharp distinction between philosophy and theurgy and paints Porphyry as a pedantic intellectualist who relies too heavily upon human reasoning when it comes to divine matters.[22] For instance, he reproaches Porphyry for his intellectual *hubris* in "conceding" that the gods exist.[23] Knowledge of the divine, Iamblichus argues, cannot be obtained through "conjecture, or opinion, or some form of syllogistic reasoning," because these mental activities belong to "temporal" or cosmic reality.[24] Iamblichus insists that divine knowledge (*noēsis*, *gnōsis*) has its source in

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[19] *DM* III.25.160-161.
[20] Ibid.
[21] Gregory Shaw, "After Aporia: Theurgy in Later Platonism," in *Gnosticism and Later Platonism*, ed. J.D. Turner and R. Majercik (Atlanta: Society of Biblical Literature, 2001), 74.
[22] On the polemics between Porphyry and Iamblichus in *De Mysteriis*, see Clarke, *Manifesto of the Miraculous,* 4-12.
[23] *DM* I.3.7
[24] *DM* I.3.9. As the translators of this edition note, Iamblichus is making similar divisions between opinion (cosmic realm) and truth (the intelligible realm) as Plato did in his image of the Divided Line in *Republic* VI (509d-513e).

eternity and is innate within us; it can only be revealed through direct contact with the divine, not by human reason (*logismos*) alone.[25]

Critiques of rational, discursive modes of knowledge are prevalent in Neoplatonic philosophy, though in the case of Porphyry, Iamblichus suggests that not all Neoplatonists have taken them to heart. Plotinus contrasts discursive thought, in which the mind is separate from its object, with intellectual (noetic) thought, in which the mind is identical with its object; the latter is superior because the mind directly apprehends the noetic Forms.[26] Iamblichus echoes this distinction in claiming that Porphyry thinks *about* the divine, but has not experienced divine union; if he had, then Porphyry would not be granting that the gods exist, as if divine reality were merely a theoretical proposition.[27] As Andrew Smith has pointed out, the primary difference between Iamblichus, Plotinus, and Porphyry regarding noetic union is that Plotinus and Porphyry consider this to be a human capacity, attained by human effort, whereas Iamblichus believes that it can only be achieved with the help of the gods.[28] Smith explains Iamblichus's position: "Unaided, human thought always stands outside the object it contemplates or reaches out towards (ultimately god). It is only through the

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[25] Iamblichus notes that true knowledge of the divine is not really "knowledge" *per se*, but contact with divine presence. See *DM* I.3.8-10, and I.21.65-66. Andrew Smith analyzes Iamblichus's terminology in "Iamblichus' Views on the Relationship of Philosophy to Religion," in *The Divine Iamblichus*, ed. Blumenthal and Clark; see especially pp. 77, 79.

[26] See Sara Rappe's discussion of Plotinus in "Self-knowledge and subjectivity in the *Enneads*," in *The Cambridge Companion to Plotinus*, ed. Lloyd P. Gerson (Cambridge: Cambridge University Press, 1996): 254-259. Iamblichus also makes this point in *DM* I.3.8.

[27] In *De Mysteriis*, Iamblichus frequently distinguishes between theurgy and theoretical speculation about the divine in order to drive his point home to Porphyry. For example, after Iamblichus gives a summary of Egyptian theology he is quick to point out that for the priests this is "not…purely a matter of theorizing, but they recommend that we ascend through the practice of sacred theurgy to the regions that are higher, more universal and superior to fate, towards the god who is the creator" (*DM* VIII.4.267).

[28] A. Smith, *Porphyry's Place in the Neoplatonic Tradition* (The Hague: Martinus Nijhoff, 1974), 84-88.

divine causality that the barrier can be broken down, the human be made divine and united with the divine. Uniting, even at the noetic level, is the work of theurgy."[29]

Zosimus makes a similar critique of rationalism, or "mortal intelligence," in his assessment of Aristotelian science:

> [Aristotle] was not [united with] the Divine Mind, but was rather a mortal man, a mortal intelligence and a mortal body. He was the most brilliant of the non-luminous beings, in contrast to the incorporeal beings….But since he was mortal, he could not elevate himself as far as the heavenly sphere; nor did he know how to render himself worthy. This is why his science and his deeds stayed in the lower region of this sphere.[30]

Despite Aristotle's intellectual brilliance—or rather because of it—he could not ascend beyond the cosmic realm. By emphasizing Aristotle's mortal qualities and the cosmic limits of his intelligence, Zosimus implies that Aristotle's mind was too logical, too focused on worldly things—physics, ethics and politics, perhaps—which prevented him from uniting with the divine mind of the Demiurge, the fount of all wisdom. He tells his colleague, Theosebia, not to follow in the ways of Aristotle; instead, she should use her "thought" to raise herself beyond the cosmic sphere by focusing it toward the divine presence in her soul.[31]

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[29] Ibid, 88.

[30] *CMA*, Syr. II.12.4 (the full quotation is reprinted here): "Il n'était pas non plus l'Esprit-Saint; mais c'était un homme mortel, une intelligence mortelle et un corps mortel. C'était le plus brillant parmi les êtres non lumineux, mis en contraste avec les êtres incorporels. Il possédait un pouvoir d'appropriation ou de résistance sur les êtres corporels et non lumineux, autres que les intelligences supérieures et les grands corps célestes. Comme il était mortel, il ne put s'élever jusqu'à la sphere céleste; il ne sut pas non plus s'en rendre digne. C'est pourquoi sa science et ses actes demeurèrent dans la région inférieure à cette sphère."

[31] *CMA*, Syr. II.12.4: "Mais toi (femme), élève-toi par ta pensée en dehors de la sphère inférieure, qui est une partie de l'univers (visible); envisage ton âme…fabriqué avec les deux intelligences, c'est-à-dire avec le Fils de Dieu, le Verbe, joint à l'Esprit-Saint, et rempli de la spiritualité de la Trinité." See also G. Fowden's discussion of this passage, which is a continuation of the one above, in *The Egyptian Hermes*, 126.

Zosimus agrees with Iamblichus that knowledge is not solely the result of human effort; divine revelation also plays a role.[32] He explains that Aristotle received the inspiration for his ideas from superior cosmic beings; but since these are cosmic divinities, their knowledge of the noetic realm is limited. This is why Aristotle excelled as a philosopher of "visible things," but was not able to adequately distinguish the "invisible things, such as the intelligences or spiritual substances." Zosimus continues, "[t]he angels who inspired his science did not know them, and consequently, they could not communicate that which they did not possess."[33] Noetic revelation, as opposed to "cosmic" revelation, is necessary in order to perceive the whole of reality.

The principle of identity between subject and object, which Iamblichus calls "gnostic" or "noetic" knowledge, is also important to Zosimus. The highest form of gnosis is union with the divine mind of the Demiurge, but identity also occurs at various levels. In his allegory of the alchemical opus, *On Excellence*, Zosimus conveys that his *modus operandi* is to identify with the metals as they are being transformed.

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[32] Iamblichus upholds Plato's view that all knowledge is either divinely revealed or recollected by the soul due to its divine origins (see Plato's *Meno* dialogue). Rationality works hand in hand with divine inspiration; the latter is the source of ideas, though due to the limitations of the human mind, not all knowledge is clearly perceived, and is often misunderstood or misinterpreted. In late antiquity, the notion that knowledge is divinely inspired was quite prevalent, and the cosmology of that era gave rise to several classes of divine beings, all of whom had different capacities for inspiring humans, for good or for ill; not all revelation occurred at the noetic, hypercosmic level. Iamblichus believes that the cosmic gods can inspire humans, but that daemons cannot (*DM* III.7.114). Zosimus thinks that both cosmic gods and daemons can reveal knowledge, but the quality of information differs.

For a discussion of how Iamblichus's views of revelation and the limitations of discursive thought are related to the Socratic-Platonic ideal of aporia, or perplexity—the state in which one realizes one's ignorance and the limitations of human thought—and how this instills a desire for the divine by creating a desire for further knowledge, see Shaw, "After Aporia: Thuergy in Later Platonism," esp. pp. 58-59, 73-75.

[33] *CMA*, Syr. II.12.4: "Voici les types d'Aristote…[text missing]…quoique philosophe pour les choses visibles, il n'a pas bien distingué l'existence des choses invisibles, c'est-à-dire celle des intelligences ou substances spirituelles. Les anges qui lui inspirèrent la science ne les connaissaient pas, et ne pouvaient par conséquent communiquer ce qu'ils ne possédaient pas." As I discussed in Chapter Three, Zosimus makes similar statements regarding rival "corporeal" alchemists, who know only things of the body, and nothing of the soul. These alchemists invoke daemons to assist them with their alchemical procedures, and Zosimus states that the daemons only have a limited understanding of nature. The celestial beings that inspire Aristotle are superior to daemons, but they are cosmic entities nonetheless.

The metals are personified in this narrative, and their identities, as well as that of the alchemist, continually slip into one another: the alchemist-priest changes into a man of copper, the copper man transforms into man of gold, who then becomes the alchemist-priest, and so forth. The point of this allegory is that all of these beings are one. When alchemy is performed in a "theurgical" manner, the differences between subject and object disappear. The alchemist identifies with the metals, which are undergoing purification as the alchemist purifies his soul, transforming it into spiritual "gold."

The problem with magic and rationalism, then, is that they are human contrivances and do not adequately represent or "work" with divine reality. Magicians impiously attempt to command the gods and overestimate their capabilities in believing that they can control divine beings. Rationalists assign too much power to human thought as a means of knowing the divine. In both cases, human causality is given priority over divine causality. Theurgy, by contrast, emphasizes the experience of divine union, in which the soul is utterly identified with the divine; this "knowledge" is revealed through divine grace. Noetic union also allows one to perceive the cosmos as a spiritual and physical whole, whereas "cosmic" knowledge provides only a partial understanding of the universe.

In the next section, I will look at another type of cosmic knowledge in which divine causes are reduced to or mistaken for physical ones. This, however, will not be my main focus. The "divine work" of theurgy is to become intimate with the divine power that is innate within the self and the world, but also transcends it. Through this work, the soul can become purified and ascend toward the noetic realms. But the work

of theurgy *begins* with the material world, and it is this relationship between the visible and invisible realms that I will now explore.

From matter to spirit: harmonizing with the divine cosmic order

Zosimus and Iamblichus, whose understandings of cosmogony and salvation are deeply influenced by Plato's *Timaeus*, believe that the Demiurge created the cosmos as a divine image of the noetic realms, and that one can experience or "see" god by contemplating the natural order. But within the visible cosmos lies an invisible order that creates, sustains, and moves the visible order. These realms are thoroughly intertwined. This invisible order consists of an array of divine beings, ranging from gods to the lowliest of daemons, all of which are creations and agents of the Demiurge; they comprise a hierarchical network of divine power extending from heaven to earth. These beings administer the laws of Fate or Necessity and thereby create the cosmic condition from which the soul must be liberated, but as agents of divine providence they can also help the soul to ascend. The task of the human soul is to overcome its attachments to Fate by perceiving the providential order in the cosmos and bringing the soul into accordance with this order. For Zosimus and Iamblichus, this is an act of divine mimesis: they imitate the Demiurge, creator of the cosmos, by re-linking matter and spirit in a harmonious way.

Before I discuss how Zosimus and Iamblichus accomplish this through their practices, I will first describe their views of the divine hierarchy and how the visible and invisible aspects of the cosmos are integrated, since this will shed some light on why they emphasize the re-linking of matter and spirit in their theurgical activities.

Iamblichus's view of the divine cosmic hierarchy is highly complex, and I will give a simplified version of it here, beginning with the gods.[34] The highest beings are the invisible gods, who are of the noetic realm. They preside over the visible gods, which are the stars and planets of the cosmic realm. Iamblichus explains that the visible gods are images of the invisible gods, produced as a result of the invisible gods "thinking their own divine forms."[35] The visible gods are thus continuous with the noetic gods, yet they are also a different order of being.[36] As cosmic gods, they are responsible for administering the laws of Fate; they generate and sustain life on earth, and they also impart worldly qualities to the human soul, both virtues and vices. Yet, Iamblichus claims that the cosmic gods can also release the soul from the realm of generation because of their intimacy with noetic gods.[37]

In Iamblichus's system, the divine chain of command continues from the celestial gods in the outer regions of the cosmos to the divine beings whose domains are progressively closer to the earth. The visible gods preside over archangels, who in turn rule over groups of angels. Below these are daemons and various other spirits that mediate between the human soul and the higher beings. Some of these entities encourage virtue and help the soul to ascend, while others pollute the soul with worldly concerns and wickedness. Iamblichus explains that daemons are the "generative and

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[34] In Book I of *De Mysteriis*, Iamblichus introduces four classes of beings—gods, daemons, heroes, and human souls—and adds angels and two classes of cosmic archons (sublunary and material) to the mix in Book II. I am omitting the heroes and cosmic archons from my discussion; these beings are below the daemons in cosmic hierarchy. See also Shaw, *Theurgy and the Soul*, ch. 12. He gives detailed information about gods, daemons, and heroes, but does not discuss the angelic beings or the cosmic archons (though these are mentioned on p. 79).

[35] *DM* I.19.57.

[36] *DM* I.19.58.

[37] See *DM* I.19 and VIII.8.271 on the relationship between the visible and invisible gods and their role in the liberation of the human soul.

creative powers of the gods in the furthest extremity of their emanations."[38] The terrestrial daemons are closest to earth and they have important, though limited, creative functions. They oversee the physical manifestation and growth of the natural world, and they are responsible for binding souls to bodies. The daemons also exist within the human body and control very specific aspects of somatic life; one might control sex drive, another hunger, while others are charged with regulating the rhythms of the breath and the beating heart.[39]

Zosimus's understanding of the divine hierarchy is similar to Iamblichus's, though Zosimus never refers to any divinities as "gods" other than the noetic trinity, which consists of the Divine Mind (the One, or the Father) and his two "sons," the Demiurge (also called the Divine Mind) and the Son of God (god's will or word). He calls the celestial bodies "intelligences" or "luminous beings" and views them as divine beings that govern the realm of Fate. His terminology is in keeping with the Hermetic philosophical tradition, which tends to reserve the term "god" for the divine creator of the noetic realm, whereas the planetary governors of the cosmic realm are viewed as divine "intelligences" or "energies."[40] The luminous planets and stars were created in the image of the Demiurge, who is "life and light," and this is particularly true of the sun, which holds a special place in Hermetic theology.[41] Zosimus meditates on the fact

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[38] *DM* II.1.67. See also Shaw on this point, *Theurgy and the Soul*, 40-43.
[39] See Shaw, *Theurgy and the Soul*, 140.
[40] There are some exceptions to this, however. The planets are called "gods" in *CH* X and *CH* XV, for example, and the sun is sometimes revered as a heavenly god (see *CH* V; *CH* IX). In several Hermetic texts the cosmos is referred to as a god and as a divine image of the creator; even so, Zosimus never refers to the sun or the cosmos as a god. He appears to be influenced by Hermetic writings that are explicit about distinguishing the noetic god from the divine powers of the cosmic realm. Both Judaism and Platonism were major influences on Hermetic theology, and the emphasis on the uniqueness of god and his supremacy to all other divine powers reflects the Jewish influences. Zosimus, too, is very influenced by Jewish thought.
[41] For Hermetic theological views of the sun, see especially *CH* V, IX, X, XVI.

that the sun is in the middle of the seven planetary spheres, just as the divine fire of the creator is at the center of all things.[42]

Angels and daemons are often absent from the Hermetic texts, or mentioned only briefly. Typically, angels (or "powers" as they are called in the *Poimandres*) are portrayed as liberated souls that reside in the fixed stars.[43] Zosimus rarely mentions them.[44] Zosimus writes profusely about the daemons, however, mostly about their negative qualities. When daemons are mentioned in the Hermetica, their ambivalent nature is usually stressed. In the hierarchy of divine beings, they are subordinate to the stellar and planetary intelligences, and their creative function is to preside over human affairs and to cause changes and turbulence within the soul. Daemons also reside within the human body. In one Hermetic text, the daemons are described as "laying in ambush in our muscle and marrow, in veins and arteries, in the brain itself, reaching to the very guts."[45]

Iamblichus believes that the soul's ascent can only be accomplished with divine assistance, and therefore theurgical rites are designed to honor and provide access to all of the divine powers that are capable of elevating the soul. He recommends that theurgists make an "accurate study" of these entities and perform rituals "in a manner

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[42] See *On the Letter Omega* 9.
[43] *CH* I.26.
[44] In Zosimus's critique of Aristotle (in *CMA*, Syr. II.12.4), translators Berthelot and Duval, who tend to Christianize Zosimus's terminology, translate one phrase as "Les anges qui lui inspirèrent la science ne les connaissaient pas, et ne pouvaient par conséquent communiquer ce qu'ils ne possédaient pas." (The angels who inspired [Aristotle's] science….) However, since Zosimus claims that these divinities have limited knowledge of the noetic realm, they are probably not angels or liberated souls, but the celestial intelligences that he mentions elsewhere in this passage. Zosimus does mention angels in *On the Letter Omega*, but only to say that they gave Adam his name. As translator Howard Jackson points out, he is probably referring to the late ancient Jewish belief that Hebrew is the language of the angels. See Jackson, *Zosimos of Panopolis: On the Letter Omega*, 48, n. 42. Zosimus's reference to angels is at paragraph 9.
[45] *CH* XVI.14.

that is agreeable to them in all cases."[46] Iamblichus honors even the lowest daemons because they are part of the divine cosmic order, and because it honors the gods who preside over them.[47] But he denies that the daemons are able to provide any sort of spiritual inspiration.[48] He says that they "weigh down the body," "drag the soul down to the realm of nature," and detain the soul within the realm of Fate.[49] Since their natural earthbound functions run counter to the goal of spiritual ascent, their influences on the soul must be neutralized. This is accomplished by purifying the soul of its passions, and by directing one's worship to the daemons' superiors: the benevolent deities that will help the soul ascend.

Both Zosimus and Iamblichus claim that as the soul becomes purified, it begins to see Fate not as a prison for the soul, but as divine providence and natural law.[50] The soul can more clearly see the natural function of daemons as agents of the Demiurge once it has begun to transcend its passions and material attachments. Zosimus rails against the daemons, and he recommends that one should exorcise them, not perform rituals that entice them.[51] But he also understands that as natural forces, they are useful and necessary. In *On Excellence*, he describes several daemons he encounters in his work: they fix the "spirits," or colors of the metals to their bodies, and some also guard the "spirits" while the metallic bodies are being melted down and transformed by the

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[46] *DM* V.25.237.
[47] Ibid.
[48] Iamblichus claims that inspiration comes from the gods, not from daemons. See *DM* III.7.114.
[49] *DM* II.6.82.
[50] Iamblichus, in a letter to his student Macedonius, explains: "…the movements of fate around the world may be likened to immaterial and noetic activities and revolutions, and the order of fate resembles this intelligible and pristine order….[A]ll things under fate are joined with undivided essence and with providence as a guiding principle. In accord with this same essence, then, fate is interwoven with providence and, in reality, fate is providence." Stobaeus fragment II, 173-174. Cited by Shaw, *Theurgy and the Soul*, 43.
[51] *CAG* III.51.8.

fire.[52] Agathodaemon, the "good daemon," not only imparts a brilliant white color to the metals, but even assists Zosimus when he loses his way during the course of his procedure, which is both a chemical transformation and a spiritual ascent.[53] Even though daemons can be helpful, their influences must be overcome, and Zosimus agrees with Iamblichus that this can be accomplished by purifying the soul and by directing one's worship to the higher god, which helps the soul overcome daemonic influences.

My point in describing their views of the divine hierarchy is to show that divinity has material and immaterial aspects that are thoroughly interconnected, and that divine beings function as natural forces. Furthermore, Zosimus and Iamblichus believe that the creative activities and energies of these divine beings form the bonds of sympathy that unite heaven and earth. As I will argue shortly, this theurgic notion of cosmic sympathy, which emphasizes divine causes and links matter to the transcendent noetic realms, differs from most theories of cosmic sympathy in late antiquity, which either attribute sympathetic links to natural causes or are otherwise limited to the cosmic realm.

For both authors, the return journey to the creative source begins with matter, and their practices involve activating the bonds of sympathy that connect the material world with the noetic realm. Iamblichus insists that theurgic rites should begin with matter, or with the visible gods, and proceed toward the invisible realms.[54] As Gregory Shaw has observed, Iamblichus believes that the ritual use of matter is the *only* way for

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[52] In *On Excellence* Zosimus refers to them as little men, not as daemons, but I think he intends them to be analogous to daemons because of the way he portrays them in a descending motion; they are continually being pulled downward toward the material realm, fixing the colors to the metallic bodies. This is consistent with his belief that daemons are earthbound entities responsible for binding souls to bodies; their actions are therefore akin to a gravitational force.

[53] See *On Excellence*, Lesson Two.

[54] See, for example, *DM* V.14.217.

the embodied soul to attain salvation.[55] Shaw argues that Iamblichus's views are related to Plato's epistemological theory of *anamnēsis*, or recollection, where the soul is reminded of the noetic Forms by means of "mnemonic prods" from the sensible world.[56] Plato's doctrine of recollection is exemplified in alchemy and theurgy by the contemplation of material objects as divine signatures (*sunthēmata*), or "receptacles" for divine energies, but to add to Shaw's argument, these divine signatures not only serve to remind the soul of the Forms, but they also activate the lines of sympathy (the divine beings) that connect the material object to its noetic source.

Iamblichus writes: "the theurgic art…links together stones, plants, animals, aromatic substances, and other such things that are sacred, perfect and godlike, and then from all these composes an integrated and pure receptacle [for the gods.]"[57] He goes on to explain that these objects enable the soul to commune with the gods:

> For there is no other way in which the terrestrial realm or the men who dwell here could enjoy participation in the existence that is the lot of the higher beings, if some such foundation not be laid down in advance…[S]uch material rouses up the gods to manifestation, summons them to reception, welcomes them when they appear, and ensures their perfect representation.[58]

Since alchemy is a metallurgical art, it necessarily begins with material objects. It differs in this respect from Iamblichus's ritual items, which are selected based upon their affinity with the gods who created them; a sunflower, for example, would be an appropriate ritual object to use when worshiping the sun because it resembles the sun in color and its "face" also follows the sun as it traverses the sky. Zosimus, on the other hand, works with metals and ingredients that will achieve his technical goals;

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[55] Shaw, *Theurgy and the Soul*, 24. Emphasis his.
[56] Ibid. See also *DM* VII.1.250; Iamblichus explicitly says: "the creative activity of the gods indicates the truth of the forms in visible signs."
[57] *DM* V.23.233.
[58] *DM* V.23.234.

nevertheless, he views his work as an occasion for worship. He calls the copper that he has colored gold a "terrestrial" sun, and connects it to the celestial sun, which is in turn a divine image of the Demiurge.[59] He also uses a series of correspondences, beginning with the physical and the common and progressing toward the sublime, to show how electrum, the substance from which mirrors are made, reflects not only one's physical image, but also the divine image within the soul; his meditation ends with an image of the entire cosmos as a mirror of noetic reality. For Zosimus, contemplating the metals as divine images and creating tinctures in accordance with the movements of the divine planets and stars are means of working with (or identifying with) divine beings, who help Zosimus perfect the metals as well as his own soul.

Zosimus's understanding of divine signatures is not limited to natural objects. As I discussed in an earlier chapter, he shows how the letters of Adam's name correspond to the four cardinal directions, to the four elements, and ultimately to the Son of God, the divine presence within nature.[60] Iamblichus also considers certain quasi-material phenomena to be divine signatures, including letters, numbers, and sounds. For example, he claims that music inspires the soul and functions as a receptacle for the gods because it reflects the divine harmony of the spheres:

> [T]hose things such as sounds and tunes are properly consecrated to each of the gods, and kinship is properly assigned to them in accord with their proper orders and powers, the motions in the universe itself and the harmonious sounds rushing from its motions. It is, then, in the virtue of such connections of the tunes with the gods that their presence occurs (for nothing intervenes to stop them) so that whatever has a fortuitous likeness with them, immediately participates in them, and a total possession and filling with superior being and power takes place at once.[61]

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[59] *CAG* III.41.1.
[60] See *On Apparatus and Furnaces* 9-13.
[61] *DM* III.9.119.

Iamblichus also criticizes certain understandings of cosmic sympathy, and this has led some scholars to argue that he refuted the notion of sympathy, or that he only embraced it to a certain extent.[62] But given that there were many theories of cosmic sympathy in late antiquity, I think he is simply trying to differentiate his theurgical understanding of sympathy (which he often calls *philia*) from the others. For example, he explains that it is "absurd" to attribute the efficacy of theurgical rites solely to the physical correspondences of the ritual materials:

> …as for instance when one assigns the number sixty to the crocodile as being proper to the sun; or to natural-reason principles, as exemplified by the powers and activities of certain animals, such as the dog, the baboon or the field-mouse, all of which have an affinity to the moon; or to the forms in matter, as in the case of sacred animals, where one looks at them from the point of view of their colors and all their bodily traits…or any other such feature of a natural phenomenon as a cause of the [ritual] efficacy….[63]

Iamblichus says that physical resemblances are *auxiliary* causes for ritual efficacy—they are "necessary consequences" of cosmic sympathy—but the primary cause is rather to be sought in the "friendship and affinity" that "binds together creators with their creations and generators with their offspring."[64] In other words, the divine powers that generate the world form the bonds of sympathy, and if a ritual works, it is because the gods have found favor with it, not because of the materials one uses (though these may indeed please the gods).

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[62] Emma Clarke argues that Iamblichus rejected cosmic sympathy; see Clarke, *A Manifesto of the Miraculous*, 48. Shaw argues against a distinction made by Andrew Smith (in *Porphyry's Place in the Neoplatonic Tradition*, 90-99), that "higher" theurgy works with the noetic realm and "lower" theurgy works with cosmic sympathies. Shaw claims that Iamblichus rejected practices based solely on natural sympathies on the grounds that they are not theurgical. See Shaw, "Theurgy: Rituals of Unification," 7-9, 25. I think Iamblichus's point, however, is that the *cause* of sympathy should be attributed to the noetic realm, and not solely to the cosmos. Theurgical rites work with sympathies, but theurgical understandings of the noetic source of these sympathies differ from the mainstream.

[63] *DM* V.8.208.

[64] *DM* V.8-9.209.

Iamblichus is, in part, trying to distance theurgy from more popular ritual applications of cosmic sympathy that are based on manipulating one aspect of nature in order to affect another. This is particularly prominent in the "magical" belief in action at a distance, whereby one uses certain objects, such as fingernail clippings, rose petals, or bat wings, to activate natural lines of sympathy and antipathy in order to affect another person or attain a desired outcome, such as winning over a lover or securing a financial profit. To the casual observer, a theurgic rite, which makes use of various stones, plants, and animals, might not appear that different from a so-called magical rite.[65] Intent is everything, however, and Iamblichus strongly emphasizes that the goal of theurgical rites is divine worship and divine union.

His views of cosmic sympathy, which extend to the noetic realm, differ from those of other philosophers. Plotinus and Porphyry, for example, think of cosmic sympathy solely as a property of the cosmos or World Soul. Since the cosmos is a single living organism that unites all parts to itself, there is necessarily sympathy (and antipathy) between all of its parts.[66] Many Stoics also held this view.[67] Iamblichus agrees with this to a certain extent, but he thinks that this explanation reduces sympathy to physical necessity and natural causes; he argues instead that the cause of sympathy is divine and utterly transcends the cosmic realm.[68] Andrew Smith points out that Iamblichus's preferred term for cosmic sympathy—*philia*, or friendship of the gods—is

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[65] This is probably why scholars have classified late ancient theurgy as a magico-religious practice. E.R. Dodds, for example, says that theurgy "used the procedures of vulgar magic primarily to a religious end." See Dodds, *Greeks and the Irrational*, Appendix II, 291.
[66] See Plotinus, *Enneads* IV.4.32.
[67] On differences between Stoic and Plotinian notions of cosmic sympathy, see Gary Gurtler, "Sympathy: Stoic Materialism and the Platonic Soul," in *Neoplatonism and Nature*, ed. M. Wagner (Albany: SUNY Press, 2002).
[68] *DM* V.7.207-208. Translators Clarke, Dillon and Hershbell note that Iamblichus's insistence that cosmic sympathy has a noetic cause and source does not reject the theories held by Plotinus, Porphyry, and Stoic philosophers (particularly Posidonius), but rather upstages them.

often connected with *nous*, and that it refers to the connective powers of the noetic gods.[69] Iamblichus's notion of cosmic sympathy, which differs from most late ancient understandings, might be more aptly described as "supracosmic" sympathy.[70]

Zosimus always traces cosmic sympathies to the noetic realms, and he would agree with Iamblichus that the cause of sympathy is to be found there. This is also evident in the way Zosimus criticizes other alchemists for their limited understandings and uses of cosmic sympathy, which pertain solely to the cosmic realm. He argues time and time again that they need to lift their sights to noetic reality. But at the same time, Zosimus refers to the art of proper timing—that is, creating alchemical tinctures in accordance with natural rhythms—as a "natural" method, and he often refers to sympathetic links in natural terms. He says his procedures are performed according to the influences or positions of the sun, moon, or stars, for example, but he does not usually refer to their divine status. Yet it is clear from his writings that he does view these celestial bodies as divine "intelligences" that are sympathetically linked to the noetic realm above, as well as to the earth below. He believes that the physical and spiritual dimensions of nature are a unified whole, and that one can only fully perceive or experience this wholeness by uniting with the Divine Mind, whose presence is everywhere in nature, but also transcends it. Zosimus's "natural" methods, then, make use of the same type of *supracosmic* sympathy that Iamblichus describes, though this does not always come across in his terminology.

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[69] Smith, *Porphyry's Place in the Neoplatonic Tradition*, 93-94. See also *DM* V.9.211.
[70] The translators of *De Mysteriis* have suggested this. See Clarke, et al., *De Mysteriis,* 239, n. 299.

Theurgy as a scientific ideal

One of the more interesting points of convergence between Zosimus and Iamblichus is that they both practice science in a theurgical way. Zosimus views alchemy as a means of uniting matter and spirit and ascending to the noetic realms; Iamblichus has a similar approach to mathematics. This fusion of scientific and religious goals sounds strange to modern ears, and this is one of the reasons why scholars have referred to alchemy and Pythagorean mathematics as "bizarre" and "irrational" practices. But Zosimus and Iamblichus lived in a time when the boundaries between science, religion, and philosophy were not strictly demarcated. Egyptian temples functioned as major centers of scientific learning, and philosophy was a polymathic enterprise that encompassed both science and religion and often integrated them.

Egyptian priests had long been regarded as expert scientists and theologians, and in the Greco-Roman period, their wisdom came to be consolidated in and represented by the figure of Hermes. Clement of Alexandria, for example, gives a stylized portrait of a procession of Egyptian priests carrying the "books of Hermes," which deal with astronomy, geography, medicine, law, music, and hieroglyphs, in addition to philosophy, theology, and ritual.[71] Zosimus would add metallurgy to this list, since he claims that Hermes is one of the great ancient masters of alchemy and refers to many of his treatises on metallurgy. But he also understands Hermes to be a great revealer of divine truth. In the philosophical Hermetic literature, Hermes teaches his disciples primarily about cosmology and salvation: how the soul can attain union

[71] Clement of Alexandria, *Stromata* VI.4.35-37. Cited by David Frankfurt, *Religion in Roman Egypt*, 239-240.

with the divine mind of the Demiurge by contemplating the cosmic order. Zosimus understands the technical and spiritual teachings of Hermes to be related. As Garth Fowden has argued, the teachings of Hermes represent a single "practical spiritual 'way'" that integrates science, technology, and spiritual pursuits; this path is intended to unveil the mysteries of the cosmos and the heavens.[72]

Iamblichus also embraced the way of Hermes. In *De Mysteriis*, Iamblichus poses as a Hermetic priest named Abamon and glorifies the scientific and theurgic wisdom of the Egyptian priesthood. Pythagoras, who was also a famous scientist-sage, allegedly acquired his wisdom from these priests. In his biography of Pythagoras, Iamblichus claims that Pythagoras spent forty-four years as a disciple of the Egyptian priests and the Magi of Babylon, who initiated him into the divine mysteries of hieratic worship and instructed him in music, astronomy, and the mathematical sciences.[73] Through his many years of study, Pythagoras attained perfect wisdom. This legend of Pythagoras's education in the Near East is an ancient one, and it was often claimed that the great philosophers, including Plato and Pythagoras, were disciples of these Near Eastern sages. Iamblichus continues this tradition in *De Mysteriis* by showing how Pythagorean and Platonic teachings agree with (and ultimately derive from) the theurgical teachings of the Egyptian and Chaldean priests.

As Fowden has observed, Platonism, colored by Pythagoreanism, was a dominant force in late ancient intellectual life.[74] A renewed interest in Pythagorean

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[72] This is the thesis of Fowden's book, *The Egyptian Hermes.* Quotation is from p. xxiv.
[73] *On the Pythagorean Life,* 4.18. Iamblichus also says that Thales was Pythagoras's first teacher, and that it was Thales who recognized Pythagoras's remarkable talents and encouraged him to travel to Egypt to study with the priests there. Ibid., 2.12.
[74] G. Fowden, "The Pagan Holy Man in Late Antique Society," *The Journal of Hellenistic Studies* 102 (1982): 36.

teachings began around the turn of the first century CE, and became a central force in Platonic thought due to the efforts of Numenius and Nichomachus (both 2nd c.), who each stressed the Pythagorean foundations of Plato's philosophy.[75] Porphyry wrote a biography of Pythagoras, and Iamblichus, who was a mathematician, carried on the work of his Platonic predecessors by framing Pythagorean teachings as the essence of Platonic thought.[76]

Pythagorean mathematics, much like alchemy, is often dismissed as a form of mysticism that has nothing to do with "real" science.[77] But many mathematicians in the Greco-Roman period, including Iamblichus, would disagree; they hailed Pythagoras as the inventor of science and viewed mathematics and the "mystical" contemplation of numbers as being interrelated. Iamblichus was apparently quite a brilliant mathematical theorist. Samuel Sambursky credits him with being the first to develop a clear conception of the possible applications of mathematics to physics—ideas that Sambursky says were not fully realized by scientists until the seventeenth century.[78] In his treatise entitled *On Pythagoreanism* (most of it now lost), Iamblichus argues that

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[75] On the Pythagoreanism of Numenius and Nichomachus, see Dominic O'Meara, *Pythagoras Revived: Mathematics and Philosophy in Late Antiquity* (Oxford: Clarendon Press, 1989), ch. 1.

[76] Dominic O'Meara says that Porphyry, who was a "universalizing" Platonist, attempted to show how Pythagorean and Platonic teachings contain the same universal truths, and that these truths corroborate with the ancient wisdom teachings of the East (Egyptian and Chaldean teachings, in particular). O'Meara argues that this is different from the "Pythagoreanizing" Platonism of Iamblichus and earlier Platonists, who "single Pythagoreanism out as the fountainhead of all true (Platonic) philosophy." See O'Meara, *Pythagoras Revived*, 27.

[77] Walter Burkert, for example, portrays Pythagoras as a type of shaman, and distinguishes between Pythagorean number mysticism and mathematical science. See Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge: Harvard University Press, 1972), 428, 466. See also Charles Kahn's discussion of how Burkert and other scholars have distinguished between Pythagorean mysticism and mathematical science in *Pythagoras and the Pythagoreans: A Brief History* (Indianapolis: Hackett Publishing Co., 2001), 2-3.

[78] Sambursky, *The Physical World of Late Antiquity*, 47-50.

mathematics has several dimensions and applications.[79] He discusses mathematical sciences, and, like Plato before him, argues that arithmetic and geometry prepare the soul for the study of intelligibles.[80] He also shows how numbers are intrinsic to creation; he identifies three levels of number: physical, ethical, and theological.[81] As Dominic O'Meara explains, Iamblichus views physical numbers as the "organizing principles of physical bodies"; they have generative power and cause change to occur.[82] Iamblichus discusses ethical numbers in terms of virtue and the measure of one's character. They are the principles of harmony and proportion that make for a "well-adjusted" soul.[83] And finally, there are the divine noetic numbers, which are the paradigms for all number and can be likened to the Forms. Iamblichus maintains that the noetic numbers derive from the One.[84]

Iamblichus's views of number echo those found in Plato's *Timaeus*. Plato, who was influenced by Pythagorean teachings, describes how the Demiurge forms the body and soul of the universe according to mathematical proportions and harmonic intervals. Numbers are thus noetic, because they are in the mind of the Demiurge, who is *nous*, but Plato also describes their physical and ethical components.[85] He discusses the geometry of bodies and the proportions and disproportions of the soul, which must be brought into harmony so that one can live a good and virtuous life. The order of nature,

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[79] For the details of this text, including chapter outlines and which fragments survive, see O'Meara, *Pythagoras Revived,* chs. 2-3.
[80] See O'Meara's discussion of this, ibid., 44-51; see also Plato, *Republic* VI, 522c ff.
[81] Iamblichus's chapters on physical, ethical, and theological number are among those lost, but O'Meara has reconstructed their content based on excerpts from Michael Psellus's works on the same topics. See O'Meara, *Pythagoras Revived*, ch. 3, and his translation of Psellus's text in Appendix I.
[82] Ibid., 62.
[83] Psellus, quoting Iamblichus, in *On Ethical and Theological Arithmetic* 15, trans. O'Meara.
[84] Psellus, *On Ethical and Theological Arithmetic* 53-83.
[85] On Plato's view of the Demiurge as *nous*, and *nous* as a cause of creation in the *Timaeus*, see Stephen Menn, *Plato on God as* Nous (Carbondale: Southern Illinois University Press, 1995), ch. 2 and 47-49.

which is mathematically arranged and structured, provides a visible model of perfect proportion and harmony that the soul can emulate and thereby attain perfection.

Iamblichus's physical, ethical, and divine numbers are clearly related to his notions of the divine hierarchy. The generative powers and properties of change he associates with the physical numbers have creative functions similar to those of the daemons; the ethical numbers, associated with the measure of one's character, function much like the celestial gods, who impart virtues and vices to the soul and whose revolutions provide a perfect model of order for the soul. And he specifically connects the divine numbers with the noetic gods by referring to these gods as *arithmoi*.[86]

Iamblichus has different ways of describing and applying mathematics—sometimes more spiritual, and other times more philosophical and scientific.[87] The goal of all Pythagorean mathematics, however, is to uplift the soul to the noetic realm. Iamblichus differentiates between technical mathematics (practiced by "the many"), which has no spiritual goals, and Pythagorean mathematics, which adapts "all its assertions to the beautiful and good," and uses those that "lead up to Being."[88] Iamblichus and Zosimus are similar in this regard. Zosimus distinguishes between "corporeal" alchemy, which deals only with the physical realm, and his own "incorporeal" approach to alchemy, which focuses on the ways in which the physical and spiritual dimensions of reality are integrated. Sometimes Zosimus's descriptions of alchemy are purely technical; other times he explains the religious dimensions of his

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[86] See Shaw, "Theurgy: Rituals of Unification in the Neoplatonism of Iamblichus," 28.
[87] His descriptions of physical and ethical numbers in *On Pythagoreanism* are rather technical and closely linked to Aristotelian concepts. O'Meara demonstrates that Iamblichus's descriptions of physical number follow the themes of Aristotle's *Physics* I-IV to the tee, and he also shows how Iamblichus makes use of passages from Aristotle's *Nichomachean* and *Eudemian Ethics* in his discussion of ethical numbers. See O'Meara, *Pythagoras Revived*, 61-76.
[88] Iamblichus, *DCMS* 91.3-11, cited by Shaw in "The Geometry of Grace," 129.

practice. Zosimus and Iamblichus may not have always performed their sciences in a "theurgical" manner, though this remains their scientific ideal.

There are no explicit references to mathematics as a form of theurgy in any of Iamblichus's surviving texts, but Proclus, one of Iamblichus's successors, states that mathematics is the "most venerable of theurgies," and that when one performs mathematics in this way, "the soul becomes at the same time seeing and seen."[89] In other words, the soul experiences divine union by theurgically contemplating the numbers and how they are intrinsic to all aspects of creation. As Shaw argues, Proclus's views of mathematical theurgy probably derive from Iamblichus.[90] Shaw connects mathematical theurgy with Iamblichus's statement that the highest form of theurgy is entirely noetic, a contemplative act in which only immaterial offerings are presented to the gods; Shaw argues that *mathematics* is the noetic theurgy that Iamblichus alludes to.[91] I disagree with Shaw on this point, however. Iamblichus's notion of "noetic" theurgy is meant to depict the enlightened soul in a state of noetic union; this is the ideal state to which all forms of theurgy aspire, and thus it represents the *goal* of mathematical theurgy, or its pinnacle.[92] Shaw also argues that numbers are

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[89] On mathematics as theurgy, see Proclus, *Platonic Theology* IV 100.21-101.4; on mathematics facilitating divine union, see Proclus, *In Euclidium* 141. These quotations are cited by Shaw in "The Geometry of Grace," 128 and 129-130.

[90] See Shaw, "The Geometry of Grace," 127-128.

[91] See *DM* V.18-19; Shaw, ibid; and Shaw, *Theurgy and the Soul*, chs. 18-19.

[92] Iamblichus says that those "who conduct their lives in accordance with intellect alone and the life according to intellect, and who have been freed from the bonds of nature, practice an intellectual and incorporeal rule of sacred procedure in respect of all the departments of theurgy" (*DM* V.18.225). He also says that the appropriate offerings for these enlightened souls are the "perfect and complete goods of the soul," which have been cultivated through virtue and wisdom (DM V.19.226). In other words, the appropriate offering for the noetic gods is the perfected soul. The soul's perfection can be accomplished *through* mathematical contemplation (and through other forms of theurgy), but I think Shaw misses the mark in arguing that mathematics *is* this noetic form of theurgy. He himself admits that he may be wrong to argue this, based on Iamblichus's depiction of noetic theurgy as the summit of theurgic worship. See Shaw, *Theurgy and the Soul*, 208.

the immaterial offerings (or divine signatures) of noetic theurgy."[93] I agree that numbers can certainly function this way, but since Iamblichus often insists that theurgical rites begin with the material and progress toward the immaterial, it is likely that he also viewed the visible aspects of number, manifest in nature, as a sort of material offering.[94] A five-petaled flower, for example, or the geometric shape of a stone most likely factored into his selection of appropriate ritual offerings for the gods. In *On the Pythagorean Life*, Iamblichus gives a sense of how number is related to material offerings and cultic activity:

> [Pythagoras] said that we make three libations to the gods, and Apollo gives his oracles from a tripod, because number first came into being as a triad. We sacrifice to Aphrodite on the sixth day because six is the first number to share the whole being of number, and however you split it up, the product of what is taken away and what is left is the same.[95]

Pythagorean mathematics, then, like alchemy, consists of multiple dimensions of practice. The technical aspects are a means for achieving a spiritual end. Arithmetic, geometry, and astronomy orient the soul to the mathematical structure and order of the cosmos, which in turn helps the soul to become aligned with this order, thereby facilitating the soul's purification and ascent to the noetic realms. Zosimus does not provide the exact details of a metallurgist's training, but he does insist that a merely physical approach to chemistry is inadequate. The true philosophers of alchemy, he says, do not focus merely on things pertaining to bodies, but also on things pertaining

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[93] Ibid., ch. 18, and pp. 208, 210.
[94] Shaw also discusses Iamblichus's views of physical and ethical number as a continuum, and notes that "all theurgy, from material to noetic, was engaged in the recovery of the soul's *numbers* by invoking their correspondences in nature." But, in my opinion, these aspects of number are somewhat overshadowed by his portrayal of mathematics as a noetic enterprise and numbers as immaterial *sunthēmata*. See Shaw, "The Geometry of Grace," 126.
[95] *On the Pythagorean Life*, section 152, trans. Gillian Clark.

to the soul.[96] Furthermore, he argues that a spiritual approach to alchemy is necessary in order to understand nature properly; he attributes the mistakes and faulty recipes of his competitors to their lack of spiritual understanding. He also attests that the goal of noetic union surpasses all other aspects of alchemy, saying that one must practice alchemy in both a spiritual and a corporeal manner until perfection is reached; it is then that the "true object of one's desire" will be found, which surpasses the corporeal arts.[97]

Though alchemy and theurgy are frequently regarded as compatible practices, detailed comparisons of the two have been sorely lacking. Scholars have tended to vaguely group them together as forms of magic or occultism, and as examples of the decline of reason in late antiquity, which tells us nothing about their similarities and also fails to adequately address ancient perspectives on these practices. Therefore, more in-depth (and less biased) investigations into the affinities between alchemy and theurgy are needed, since this can yield a better understanding of these late ancient arts.

The hallmark of theurgy is the emphasis on *experiencing* the divine cosmos, rather than simply theorizing about it. Iamblichus's notions of theurgical experience include an emphasis on ritual techniques that encourage divine revelation, as well as forms of knowledge in which the subject is united with the object of its thoughts; this knowledge is revealed by the gods, not attained by human effort alone, and the pinnacle of theurgical knowledge is attained when the soul experiences union with the divine creator. Zosimean alchemy is indeed a form of theurgy, at least according to Iamblichus's definitions, and the alliance of the two helps to clarify the experiential nature of alchemy and how this encompasses the technical and spiritual dimensions of

[96] See, for example, *CMA*, Syr. II.8.1.
[97] *CMA*, Syr. II.11.21. See Chapter Two, n. 9 for French translation.

Zosimus's practice. Both Zosimus and Iamblichus believe that the soul's journey to the divine source begins with the material world; the soul must become aligned with the natural order and experience the revelations of the hierarchy of divine cosmic beings during the course of its ascent. They claim that experiencing the divine cosmos and harmonizing with its perfect order enables the soul to transcend its limited "cosmic" perspectives and attain union with divine mind of the Demiurge, whereby the soul can behold heaven and earth as a divine totality.

As I have argued, theurgy is not only a religious practice, but also a scientific ideal. Theurgical approaches to science—such as Zosimean alchemy or the Pythagorean mathematics practiced by Iamblichus—include ritual elements, and theurgic rituals include scientific elements: science and religion are purposefully united in the theurgist's quest for universal truth. This is an important point, because modern tendencies to view religion (ritual) and science as separate domains have hindered our understanding of late ancient alchemy and theurgy. Alchemy, for example, has been portrayed as a ritual practice that is only cursorily related to "real" chemistry or metallurgy.[98] Conversely, it has also been argued that alchemy is a primarily a technical art that has little to do with religion.[99] Theurgy has also been subject to this dichotomy: since theurgy is usually framed as a ritual practice, its scientific

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[98] See, for example, Joseph Needham, *Science and Civilization in China*, vol. V, 10-11; and Naomi Janowitz, *Icons of Power: Ritual Practices in Late Antiquity*, 111, 114.

[99] Principe and Newman have argued that the religious language of alchemy can be better understood as technical terminology, and they tend to downplay the religious elements of alchemy. See their article, "Some Problems with the Historiography of Alchemy," 418. A more extreme example—and one that directly relates to Zosimus—is provided by Jean Letrouit, who challenges the notion that Zosimean alchemy is religious at all and argues that Zosimus uses religion polemically to make fun of his competitors. He writes, "In my opinion it is wrong to see in him a partisan of Hermes, a gnostic or a Christian: Zosimos is a goldmaker." See Letrouit, "Hermetism and Alchemy: Contribution to the Study of Marcianus Graecus 299 (=M)," 88.

dimensions have largely been overlooked.[100] But Zosimus and Iamblichus do not view science and religion as mutually exclusive, but rather as mutually enhancing. In this comparison of Zosimean alchemy and Iamblichean theurgy, I have attempted to bring the fusion of religion and science into sharper focus, since the ways in which they integrate the two in their efforts to harmonize with the divine cosmos seem to me to be a key factor in understanding the relationship between these arts and how they differ from other scientific and religious practices in late antiquity.

[100] Shaw's work on mathematics as a form of theurgy is an important exception to this, and I hope this comparison of alchemy and theurgy will add to Shaw's pioneering efforts in this area.

CHAPTER FIVE:

NATURE, CULTURE, AND THE PROBLEM OF COSMIC SYMPATHY

As I have shown, Zosimus frequently criticizes the "unnatural" alchemical methods of his rivals, which he claims are technically, morally, and spiritually inferior to the "natural" methods he practices. Zosimus's natural approach to alchemy involves observing and working in harmony with cosmic cycles; he believes this is crucial to scientific and religious endeavors. He claims that his competitors, on the other hand, attempt to override natural rhythms by enlisting the help of daemons in their work. I have argued that different notions of cosmic sympathy, or theories about how all parts of the universe are interconnected by invisible forces that link the microcosm to the macrocosm, are at the root of these polemics. In the previous chapters I examined Zosimus's views of cosmic sympathy in light of other theories—from the varied examples found in writings attributed to Democritus (some are more sophisticated than others; see chapter one) to those found in Jewish astrological texts (chapter three) and in Neoplatonic theurgy (chapter four)—in order to bring Zosimus's spiritual approach to alchemy into sharper focus and also to demonstrate that late ancient theories of cosmic sympathy were by no means uniform, a fact that is often overlooked by scholars.

In this final chapter I argue that cosmic sympathy has been a major stumbling block in the study of early alchemy because of the way it has been essentialized and used as a defining characteristic of magic and "primitive" thought. Following the work of Bruno Latour, who views the bifurcation of nature and culture as being foundational to modern thought, I argue that "moderns" have difficulty interpreting

cosmic sympathy because of the tendency to 1) view nature and culture as distinct domains and 2) to view cosmologies that blend nature and culture, especially those that are based on cosmic sympathy, as pre-modern or "primitive." I will demonstrate how modern portrayals of alchemy as a form of magic or primitive pseudo-science have been used to reinforce and maintain the boundaries between alchemy and modern science by portraying the alchemist as "other." My point, however, is not solely to unmask modern biases; I will also show that truth claims regarding nature and culture were also occurring in the ancient world, and that these were important factors in ancient demarcations of science, magic, and religion, and in Zosimus's polemics against his rivals.

I will be using the terms "nature" and "culture" in a very general sense: "nature" refers to the natural world, and "culture" refers to human creations and constructs. My definitions are purposefully loose, because the point is to show how definitions, demarcations, and hybrids of these realms shift over time and take on new meanings in different contexts.

Cosmic sympathy and modernity

Modernity is a construct that signifies a radical break with the past, with outmoded ways of thinking and being in the world. Hence the familiar narratives of modernity, which began to take shape in sixteenth- and seventeenth-century Europe, are those of a new era of Enlightenment arising out of the darkness of an ignorant, archaic past like the dawn of a new day. The triumph of reason over religious superstition, the Scientific Revolution, and the impetus toward unfettered progress and expansion are key examples of the ideological narratives that have shaped modern

identities. Bruno Latour argues that the real crux of modernity, which underlies and supports all these narratives, has been the work of separating (or "purifying") nature and culture. Latour explains that as Enlightenment thinkers, particularly scientists, began to disentangle human interests and ideologies from their descriptions of the physical world, they contrasted their endeavors with the "obscurity of the olden days, which illegitimately blended together social needs and natural reality, meanings and mechanisms, signs and things."[1]

But, as Latour claims, we have *never* been truly modern. Modernity is not a singular ideology or identity, but a diverse and fractured one. Modern values and social structures are questioned and challenged, and it is common for individuals to hold both modern and "anti-modern" viewpoints, blending or alternating between rationality and irrationality, progress and conservatism, scientific materialism and religious faith. As Latour argues, moderns have never completely disjoined nature and culture, just as the "others" (that is, the "primitives" and pre-moderns) never completely superimposed them.[2] Latour claims that, paradoxically, the modern insistence on this separation has actually led to a greater proliferation of nature-culture hybrids in the modern era, such as genetically modified foods, the ozone hole, and *in vitro* fertilization, to name but a few recent examples. But because moderns are accustomed to conceptually separating nature and culture, they tend to respond to hybrids in the following ways: one is to ignore the fact that these are nature-culture hybrids, thereby allowing them to proliferate without restriction; another is to react in horror to the "quasi-objects" spawned by such hybridity; there is also a tendency to side with either nature or culture,

[1] Bruno Latour, *We Have Never Been Modern* (Cambridge: Harvard University Press, 1993), 35.
[2] Ibid., 104.

which can be seen, for example, in the nature/nurture debates encountered in fields like psychology and gender studies, and in the recent "science wars" in which issues such as the social construction of science, and representation *versus* reality, are hotly debated.[3]

Cosmic sympathy, in its various forms, is an example of a hybrid cosmology, one that modernity has rejected in favor of a purely "natural" cosmology in which the universe is described in physical, materialistic terms, not in psychical or analogical ones. The belief that planets can influence human behavior, that the rhythmic beat of one's heart is caused by a daemon, or that gold-making is best performed in the summertime when the sun is at its full power, is conceived by "moderns" as the very opposite of modernity because it exhibits a fusion (or confusion) of nature and culture, of mind and matter. Furthermore, theories of cosmic sympathy often include the notion that the invisible forces connecting all parts of the universe are somehow *divine*, or are otherwise capable of linking natural objects, humans, and other life forms to divine realities. Modernity, on the contrary, has purged the divine presence from nature; scientific descriptions of nature are allegedly free of all these projections of the human imagination.

Alchemy, as I have already argued, has proven problematic for some scholars because it is a hybrid of science and religion. In some cases, this has led to early alchemy being classified as a ritual practice or mystical cult that is only tangentially related to "real" science or technology, or, conversely, as scientific pursuit that has little to do with religion.[4] As Latour suggests, the modern bifurcation of nature and culture

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[3] Ibid, 40, 104, 112.

[4] See Ch. 4 for a fuller treatment of this issue. For examples of early alchemy treated primarily as a religious practice, see Joseph Needham, *Science and Civilization in China*, vol. V, 10-11; and Naomi Janowitz, *Icons of Power: Ritual Practices in Late Antiquity*, 111, 114. Examples of scholarship that

can be glimpsed lurking beneath the surface of these science/religion dichotomies. Since alchemy is based on theories of cosmic sympathy that describe the world analogically, and that fuse together nature and culture in ways that moderns have rejected, this hybridity has been a greater source of misunderstandings and misrepresentations of alchemy than the issue of its science/religion hybridity. Cosmic sympathy is "other" to modern cosmology and science, and therefore subject to modern prejudices. In particular, it is frequently used as a definitive characteristic of magic and of the "irrational" thinking exhibited by traditional cultures and pre-modern peoples, who are often portrayed as being unable to properly distinguish between the natural order and the analogical connections they make in their attempts to understand the natural world.[5] These biases have been pervasive in scholarship on alchemy, and have distorted several ideas found in early alchemical literature.

Alchemy as "primitive" thought

Alchemy has been marginalized in Enlightenment narratives of how "real" science emerged from an obscure past. As Lawrence Principe and William Newman have shown, etymological distinctions between alchemy and the "newer" science of chemistry were commonplace by the early eighteenth century; prior to this, the terms had been used interchangeably to describe a variety of chemical experiments, including medicine and gold-making. Once the terms were differentiated, alchemy was used

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emphasizes the scientific aspects and downplays or dismisses the religious elements of alchemy can be found in Lawrence Principe and William Newman, "Some Problems with the Historiography of Alchemy," 418; and Jean Letrouit, "Hermetism and Alchemy: Contribution to the Study of Marcianus Graecus 299 (=M)," 88.

[5] These views have, of course, been prominent in late nineteenth and twentieth-century scholarship dealing with magic, science, and religion, including the work of James Frazer, E.B. Tylor, and Lucien Lévy-Bruhl, to name a few, though they are certainly not without their detractors. For a good overview of these theories and theoretical debates, see Randall Styers, *Making Magic: Religion, Magic, and Science in the Modern World* (New York: Oxford University Press, 2004).

almost exclusively to designate gold-making practices.[6] The religious aspects of alchemy were also emphasized, and by the nineteenth century, alchemy, along with astrology, was largely conceptualized as an "occult science."[7] The rational science of chemistry was thus defined in opposition to the "irrational" practices of alchemists, who falsely believed they could change lead into gold and whose aims were esoteric and mystical, not scientific. Of course, proponents of the mystical interpretations of alchemy did not see it this way, and as Newman and Principe claim, their positions are often related to Romantic critiques of modern science; yet, by claiming that alchemy is primarily religious, they also reinforced the distinctions between alchemy and chemistry that were forged by modern scientists.[8]

In the late nineteenth and early twentieth centuries, the relationship between magic, science, and religion became a popular topic of inquiry. Scholars like James Frazer and E.B. Tylor proposed theories that human thought progressed through stages of magical and religious worldviews before arriving at a scientific worldview, and these ideas were very influential. One can see traces of these evolutionary schemas in histories of alchemy, and this has had an impact on studies of Greco-Egyptian alchemy in particular: there is often an underlying assumption that the Greco-Egyptian origins of alchemy must be even more irrational or "primitive" than the alchemy practiced in early modern Europe.

Another "modern" historiographical narrative that has been influential in alchemical studies is the characterization of late antiquity as a period in which Greco-

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[6] Lawrence Principe and William Newman, "Some Problems with the Historiography of Alchemy," 386. See also my introduction to the present work for a fuller treatment of these issues.
[7] Ibid., 387.
[8] Ibid, 385, 417.

Roman achievements in science and rational thought gave way to superstition, credulity, and general intellectual decline. E.R. Dodds has famously referred to this era as a "return of the irrational," which he and other scholars have portrayed as a cultural regression into a more primitive mode of thinking. The rise in popularity of alchemy, astronomy, and theories of cosmic sympathy in this era are often upheld as preeminent examples of this "fall" into irrationality and magical thought.[9] Dodds, for example, refers to cosmic sympathy as an "irrational doctrine" that rests upon the "primitive conception of the world as a magical unity," and claims that the wide acceptance of "pseudo-sciences" by the educated elite is evidence of how the flow of ideas is not always from the top down, from the intellectuals to the masses, but exemplifies how achievements in science and philosophy can be occluded by the superstitions of the lower classes.[10] Scholars have often explained the rise of alchemy in the context of this era of late ancient irrationalism, sometimes adding that the influx of magic and mysticism into scientific thought cannot possibly be a Greek development, but is rather due to "oriental" influences.[11]

Clearly, there are several modern biases at work in these depictions of alchemy and cosmic sympathy. A binary logic is operating in which Western notions of rationalism, science, and education are configured as superior to and utterly distinct from the alchemists' primitive, magical, irrational and Oriental theories of nature. These prejudices tend to be more transparent in earlier studies of alchemy, before

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[9] See, for example, E.R. Dodds, *The Greeks and the Irrational*, 245-247; A.-J. Festugière, *La Révélation d'Hermès Trismégiste* Vol. I: L'Astrologie et Les Sciénces Occultés (in ch. 1 he situates these sciences within the era of "le déclin du rationalisme"); and Robert M. Grant, *Miracle and Natural Law in Graeco-Roman and Early Christian Thought*, 15, 41, 61.

[10] Dodds, *The Greeks and the Irrational*, 244-247.

[11] See, for example, F.S. Taylor, "A Survey of Greek Alchemy," 110; Robert Multhauf, *The Origins of Chemistry*, ch. 5; and Paul T. Keyser, "Alchemy in the Ancient World: From Science to Magic," 366-372.

critiques of these viewpoints became more commonplace, though it should be acknowledged that there are many exceptions to this: there are instances of recent scholarship that display blatant "modern" prejudices, while some scholars writing in the earlier half of the twentieth century challenge and contest them. More often, I find that these biases are more subtly diffused, and that traces of them are found even in works that explicitly critique such stereotyping. These biases, whether consciously held or not, have given rise to several "primitive" interpretations of ancient alchemy that are inaccurate, yet continue to persist and go unquestioned by scholars. These misrepresentations are most acute in scholarly explanations of ancient theories of the transmutation of metals, and I will give a few examples here to illustrate this point.

Greco-Egyptian alchemy is commonly portrayed as the art of transmuting base metals into gold, which, again, is a modern stereotype that dates back to the eighteenth century, when "alchemy" came to designate gold-making and "chemistry" was given more scientific connotations. As I argued in Chapter One, many European alchemists believed that base metals could indeed be converted into precious ones, but Greco-Egyptian metallurgists do not appear to have shared this belief. Their writings indicate that they were quite aware that they were *coloring* metals, giving base metals the appearance of gold, not artificially transmuting one species of metal into another. In other words, they conceived of transmutation as a change in color, not as a fundamental change in substance. A.J. Hopkins, an influential scholar of alchemy, first argued this point in a series of articles written in the 1920s; yet scholars have largely ignored his theory of "transmutation by color,"—not rejected or refuted it, but ignored it—whereas other aspects of his work, such as his explanation of the color stages of the *kērotakis*

process, have been widely embraced and cited.[12] This oversight of Hopkins's major theoretical contribution to alchemical studies is interesting, but even more so is the fact that more scholars have not perceived the difference between the color transmutation described in these ancient alchemical texts and the notions of changing lead into gold (substance transformation) that they project onto these texts.[13] I think this is because we are so habituated to the stereotype that alchemists (falsely) believed they could change lead into gold that we tend to interpret the data in ways that fit into this ready-made conceptual box; in doing so, however, scholars unwittingly mystify the subjects of their study by creating irrational, magical, pre-modern or "primitive" beliefs where none exist.[14]

A further example of this mystification of alchemy is found in one of the most widespread scholarly theories of transmutation, the theory that ancient alchemists believed that metals grow from seeds like plants and will all eventually ripen into gold, and that the task of the alchemist is to hasten this natural growth process.[15] According to Principe and Newman, this theory was introduced in the 1920s by Hélène Metzger, a historian of science who was deeply influenced by the work of Lucien Lévy-Bruhl, who

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[12] Tenney Davis wrote in 1936 that Hopkins's "color theory" appears to be firmly established, but by this he apparently means that it is well-argued and widely published, rather than widely cited by his contemporaries, since the latter is not the case. See Tenney Davis, "The Problem of the Origins of Alchemy," *The Scientific Monthly* 43, no. 6 (Dec. 1936): 555.

[13] Joseph Needham is a notable exemption to this. The issue of aurifaction (gold-making) *versus* aurifiction (gold-faking) is an important theme in his discussions of ancient alchemy, and he addresses Hopkins's color theory in detail. Hopkins argued that alchemists who literally believed they could change base metals into gold are "pseudo-alchemists"; whereas Needham takes the opposite position, claiming that a belief in substance transmutation is essential to the definition of alchemy. See Needham, *Science and Civilization in China,* Vol. 5, II, pp. 7-46.

[14] See Peter Pels and Randall Styers, who argue that modern discourses about magic have reinvented and produced magic in the process; in Peter Pels, introduction to *Magic and Modernity*; and Randall Styers, *Making Magic: Religion, Magic, and Science in the Modern World*.

[15] This theory of transmutation has been very influential and can be found in the work of several scholars, including A.J. Hopkins, Mircea Eliade (this is a major thesis in his work on alchemy), and, more recently, by Naomi Janowitz. See Hopkins, *Alchemy: Child of Greek Philosophy*, 25-28; Eliade, *The Forge and the Crucible*, 50; and Janowitz, *Icons of Power*, 120.

happened to be her uncle.[16] She explained ancient alchemical theories of nature using Lévy-Bruhl's theories of "primitive mentalities," which postulate that the primitive mind differs from modern logic in that a radical participation and identity is experienced between people and objects, between humans and the natural world; this leads "primitives" to confuse their concepts of nature with nature as it really is.[17] Scholars who have been influenced by Metzger's theory, whether directly or indirectly, typically explain that these ancient theories of transmutation arise from beliefs in 1) cosmic sympathy, which is explained as a belief in a vital connection and identification between the growth processes of the animal, vegetable, and mineral worlds, and 2) the unity of matter, in which all things are essentially one and therefore have the capability of transforming into each other. Cosmic sympathy and the unity of matter are certainly present in the Greco-Egyptian alchemical literature, though ancient interpretations are more nuanced than those given above, but the idea that metals literally grow from seeds and will naturally mature into gold is *not* found in these texts. There is evidence that some European, Chinese, and Arabic alchemists may have held these views, but, as is the case with the notion that lead can be artificially transmuted into gold, the Greco-Egyptian alchemists did not share these beliefs, and were therefore not the originators of them.[18]

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[16] See Principe and Newman, "Some Problems with the Historiography of Alchemy," 410; and Cristina Chimisso, "Hélène Metzger: The History of Science Between the Study of Mentalities and Total History," *Studies in History and Philosophy of Science* 32, no. 2 (2001): 203-241.

[17] According to Lévy-Bruhl, primitive mentalities are characterized by analogical reasoning and are therefore pre-logical, as opposed to modern logic. This is different from saying that primitive mentalities are "irrational," since he claims that they do exhibit a kind of coherence and rationality. See Principe and Newman, "Some Problems with the Historiography of Alchemy," 410; Stanley Tambiah, *Magic, Science, Religion and the Scope of Rationality*, 86; and Styers, *Making Magic*, 134.

[18] The original texts need to be examined on a case-by-case basis. Eliade cites a handful of examples of the belief that all metals become gold, but I am not convinced by any of them. For example, he cites a line from Ben Jonson's comedy, *The Alchemist* (1610), in which Subtle, the alchemist, says: "The same

There are indeed many references to the growth and growing of metals in Greco-Egyptian alchemical literature, but these seem to be consciously intended as metaphors for the process of coloring metals: the colors "grow" and "ripen" due to the alchemist's careful cultivation. Some of these metaphors may have been adapted from miners, who knew how to artificially "grow" certain minerals in the ground. For example, Pliny records a technique for fabricating chrysocolla, or "gold-solder," in mine shafts. Chrysocolla is a liquid that flows alongside of veins of gold, along with a slime that gets solidified in winter due to the cold. According to Pliny, miners "grow" their own chrysocolla by injecting "a gentle flow of water into the vein all winter" which is then dried off during the summer months.[19] He explains, "gold-solder is nothing else than the putrefaction of a vein of metal."[20] The artificial growth of substances through putrefaction (or corrosion) is a common theme in Greco-Egyptian alchemical literature, most often expressed in metaphors of death and rebirth. These alchemists also speak of the mating of "male" and "female" substances, and gestation and womb metaphors are frequently employed when discussing the time it takes to produce or "give birth" to a colored metal or other substance. Alchemists also say that they add a "seed" or small bit of gold to a mixture in order to produce a gold-colored tincture. This language does not indicate that they literally believed that metals grow from seeds, like plants; they were actually more inclined toward Aristotle's theory that metals are formed and "grow" underground due to vaporous exhalations being

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we say of lead, and other metals, which would be gold, if they had time." This is not a good source to use, however, since this is a satirical work that makes fun of gullibility. See Eliade, *The Forge and the Crucible,* 50-51.

[19] Pliny, *NH* 33.26.

[20] Ibid.

compressed within the earth.[21] These seed and growth metaphors appear to be part of the jargon of late ancient metallurgists, and should not be taken as a sign that they have deduced that metals grow in the same way that plants or human embryos grow. The scholars are the ones who seem to be mistaking analogy and metaphor for "reality" in these cases, not the ancient alchemists.

The unity of matter is a prominent theme in Greco-Egyptian alchemical literature, but this is not an undifferentiated unity in which all types of metals will eventually become gold, or one species can somehow be transformed into another. Greco-Egyptian alchemists were aware that they were coloring metals, and they adhered to a principle of "like begets like": just as humans beget humans and wheat begets wheat, silver generates silver and gold generates gold.[22] The alchemical notion of the unity of matter, captured in the oft-repeated refrain "One is the All," refers to the essential unity of the four elements, an idea also espoused by Plato and Aristotle. This unifying principle underlies and connects all parts of nature, which makes cosmic sympathy possible. Alchemy, like ancient medicine, is a science of the transmutation of the four elements and their respective qualities, hot, dry, wet, and cold. Alchemists believed that everything in the universe is composed of these elements, and their work with metals and chemicals is often described in terms of how the elements are interacting. They liken these elemental changes and interactions occurring in their alchemical vessels to the natural changes occurring in the macrocosm—to the growth of plants in particular (the colors of metals are said to bloom like flowers), which

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[21] Aristotle, *Meteorology* 3, 378a.14-378b.4. In *On Excellence*, for example, Zosimus likens his "natural" method of "growing" colored metals to the natural formation of metals, saying that it is like "breathing in and breathing out." See F.S. Taylor's translation, in *The Alchemists*, 58.
[22] See Ch. 3 for a discussion of this emphasis on like begets like in Hermetic alchemical texts.

depend on harmonious combinations of sun, moisture, earth, and air in order to thrive and propagate. It was a common belief in antiquity that the existence and health of *all* life forms depended on the proper blending of these elements. The belief that the planets and stars had an influence on terrestrial life is also an important component of alchemical theory, and chemical operations were performed in ways that integrated celestial rhythms along with seasonal and diurnal cycles.

Alchemists *do*, therefore, make associations between the plant, animal, and mineral realms and believe that an underlying unity connects them all. Scholars are right to point this out, and to acknowledge the ways in which alchemical theories of nature are indebted to Greek nature philosophy (which many scholars do in their attempts to provide the rationale for the alchemists' alleged theories of transmutation). The problem with the explanations of transmutation proposed by academics—that metals grow from seeds and eventually become gold—is that 1) there is no explicit evidence for this in the Greco-Egyptian alchemical literature, and 2) their interpretations often put a "primitive" spin on the notions of unity and cosmic sympathy that *are* expressed in the literature, which perpetuates the modern stereotype that primitive and pre-modern peoples are unable to discriminate between the analogies and metaphors they use to describe nature, and nature as it "really is."

As Randall Styers argues, magical and primitive worldviews are "readily invoked by partisans of differing positions as the antithesis of modern rationality."[23] This polarization defines and reinforces the boundaries of modern notions of reason, science, and progress. More fundamentally, these designations are also used to drive a wedge between ancient and modern views of nature. As I have shown, scholars tend to

[23] Styers, *Making Magic*, 161.

assert that alchemy rests on "irrational," "primitive," or "magical" conceptions of nature. This is not always portrayed in a negative fashion, however. Eliade, for example, critiques modern ideologies in his work on alchemy, particularly the idea of conquering nature that coincided with the secularization of nature and of human labor in the modern era. Though Eliade notes that the idea of mastering nature was present in primitive metallurgy, he claims that ancient metallurgists saw their work in a different light, as a "perfecting of Nature," and believed they were working in conjunction with God.[24] Thus, he sees the modern, secular notion of conquering nature as an unfortunate departure from the sacred, organic worldview of primitive metallurgists. Whether one sides with primitive or modern perspectives, this nevertheless involves a polarization of "modern" and "primitive," and a privileging of one view of nature over another.

Appeals to "right" understandings of nature are frequently used to sanction certain beliefs and disparage others. As Stanley Tambiah argues:

> A commitment to the notion of nature as the ground of causality, of nature as a uniform domain subject to regular laws, can function as a belief system without its guaranteeing a verified "objective truth" as modern science may define it. In other words, the appeal to "nature" or "science" can serve as a legitimation of a belief and action system like any other ideological and normative system.[25]

This is applicable to contemporary nature-culture debates as well as to ancient ones. Zosimus's antithesis between "natural" and "unnatural" methods is an excellent example of this principle—and also of Latour's assertion that we have never been modern. I will turn now to an examination of how nature/culture relations (and separations) factored into ancient distinctions between science, magic, and religion, and review Zosimus's polemics in light of these shifting dynamics.

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[24] Eliade, *The Forge and the Crucible*, 171.
[25] Tambiah, *Magic, Science, Religion, and the Scope of Rationality*, 10.

Nature and culture in the ancient world

The nature/culture split that Latour insists is fundamental to modern ideologies and identities is not exactly a modern idea. The pre-Socratic philosophers of ancient Greece distinguished between natural and supernatural (theistic) domains of causality, though this bifurcation was never perceived as a complete break in the way that it is in the modern era. Rather than bracketing the divine from their explanations of nature, the pre-Socratics introduced new conceptions of nature as a divine, intelligent, unifying force. Truth claims regarding nature/culture issues are, in any period, always contested, and in ancient Greece, these manifested in debates over the privileging of either *phūsis* (natural law), or *nomos* (human customs, laws, traditions).[26] The dynamics of these debates differ from modern ones in that the Greeks venerated anything ancient, and therefore viewed the innovations of the nature philosophers as suspect. These "new intellectuals" were accused of atheism and impiety, and their investigations of nature were ridiculed; some were exiled and even sentenced to death.[27] Socrates, for example, was considered a nature philosopher by his contemporaries and was lampooned as such in Aristophanes's comedy, *The Clouds*. Being perceived to be on the side of *phūsis* in the *phūsis/nomos* debates also cost Socrates his life: one of the indictments against Socrates that led to his execution was that he taught his pupils to investigate "things in the heavens and below the earth," and to "disbelieve in gods."[28]

In the Hellenistic period, nature philosophy became more accepted and was held in high esteem, particularly due the successes of astronomy, which brought the idea of a

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[26] For an excellent discussion of these ancient dynamics—and for observing "modern" biases at work in interpreting them—see F.M. Cornford, *From Religion to Philosophy* [1912] (Princeton: Princeton University Press, 1991).
[27] See Walter Burkert, *Greek Religion*, 316.
[28] Plato, *Apology* 23d. Trans. Hugh Tredennick.

well ordered, intelligently designed cosmos into sharper focus. Philosophers encouraged people to observe the cosmic order as a spiritual exercise, as a means of knowing the divine and purifying the soul. Instead of being perceived as a threatening new development, the investigation of "things in the heavens and below the earth" was framed as a timeless path to ultimate wisdom, one that had long been trodden by the priests and holy men of Egypt and Persia. New developments in astronomy, therefore, were not considered new, since astronomy had its roots in the ancient past. Greek philosophers like Pythagoras and Plato were said to have acquired their scientific and religious wisdom by undergoing initiations and long periods of training with Near Eastern priests, who were often renowned as *magoi*, or magicians. This is yet another reversal of modern Western prejudices: the ancients' admiration for the spiritual-scientific wisdom of the East, and their tendency to trace the roots of Greek philosophy to Near Eastern cultures is the opposite of sentiments found in scholarship on alchemy, in which boundaries are sometimes drawn between rational Greek philosophy and irrational "oriental" tendencies to blend science with mystical occultism.

This greater acceptance of nature philosophy in the Greco-Roman period was not universal, however. Investigations of nature continued to be held suspect by some people and were often associated with magic in a negative sense. The trial of Apuleius is a case in point. In 158 CE he was brought to trial on charges of magic, and one of the accusations was that he purchased some rare fish and cut them up, presumably for the purpose of performing love spells. In his rebuttal, Apuleius claims that the accusation is ridiculous, that he may have simply bought the fish to eat, but goes on to explain that he had actually procured them for the purpose of scientific study, out of a

desire to emulate Aristotle and Plato who encourage such investigations.[29] The possession of natural "objects" like Apuleius's fish, or certain herbs, flowers, and stones, could therefore arouse suspicion that these objects were being used in "unnatural" magical spells instead of for more useful, "natural" purposes like cooking, healing, or increasing one's knowledge of the natural world. Ancient polemics against magicians usually involve the idea that magicians have a wrong view of the natural order: magicians try to manipulate and control nature, selfishly impose their will on the cosmos and on other human beings, and attempt to transform themselves into something that is not their natural state, such as morphing into an animal, or making themselves invisible. Modern notions of magic derive from these views. Moderns continue to associate magic with attempts to control nature and manipulate others, though they typically deny that magic is possible because it is based on a faulty understanding of nature (cosmic sympathy). Yet, on the other hand, if one has the "right" understanding of nature, the ability to master nature and bend it to human will is praised by moderns as scientific ingenuity and progress.

As Latour explains, the difference between ancients (or pre-moderns) and moderns is that pre-moderns were far more careful about the connections they made between nature and culture and the hybrids this would produce.[30] I add to this that ancient Mediterranean cultures were also more cautious in how they demarcated these realms; nature and culture could not be fused too closely, nor could they be too distinct from one another. Magicians overstep a boundary by tampering with nature in illicit ways, by using natural objects for "unnatural" purposes and by forcing nature to

[29] Apuleius, *Apology* 29-41.
[30] Latour, 41-42.

acquiesce to human demands. Appealing to nature at the expense of culture was also viewed with suspicion. Tendencies toward materialism were considered impious because they de-emphasized the gods and promoted atheism, and also because appeals to nature and natural law could sanction all kinds of behavior that were normally kept in check by cultural restraints. It was feared that following one's natural instincts could lead to a life of unbridled lust and gluttony, for instance, if codes of conduct—especially religious ones—were not in place. Moderns have similar cultural constraints, but the difference is that nature and culture are conceptually separated to a greater degree, which allows each domain to flourish without much intervention from the other. This manifests in the idea that scientific pursuits should not be impeded too much by ethical or religious concerns, for example, or that aspects of human civilization should be allowed to expand and develop regardless of the damage this does to the natural environment.

Thus, in all eras, perceptions of "right relations" between nature and culture and the ways in which we demarcate these realms have a great impact on human belief and action systems; they shape our ideas about what is possible, what should be restricted, and how we act accordingly. They are also very influential on the ways in which those who have different ideas about nature/culture relations are perceived.

Nature-culture dynamics in Zosimus's polemics

Zosimus, along with other late ancient philosophers, particularly Neoplatonists, believed that only those who experienced a mystical union with the divine mind of the creator could truly understand nature. They envisioned this religious-scientific quest as a spiritual journey beyond bounds of nature in order to view it from "on high," from the

perspective of the Demiurge, and also as a journey to the divine presence within, to the spiritual core that is concealed by the flesh of the world. Since knowledge of the cosmos is divinely revealed, this privileged understanding of nature is rather exclusive. Zosimus frequently distinguishes between those who focus solely on the flesh and the visible world, rather than on the spirit and the invisible order of creation; most people, he says, belong to the former group. He believes that true philosophers are those who understand not only things of the body, but also things of the soul. Iamblichus has a similar view, claiming that the masses turn their attention solely toward nature and things pertaining to the cosmic realm, but that those who are more enlightened also focus on the divine intellect, or "universal nature."[31] As I discussed in Chapter Four, Zosimus and many Neoplatonists claimed that even Aristotle, who had an extensive knowledge of the natural world, did not understand nature completely. His explanations of nature were considered materialistic and viewed as evidence that he did not have the privileged knowledge of nature that comes from experiencing divine union. These truth claims reflect ancient suspicions that materialism leads to atheism, only now it is the philosophers who are making these assertions, whereas in classical Greece they were the victims of such claims.

Right views of the divine beings that generate and sustain the cosmic order are crucial to Zosimus's distinctions between "natural" approaches to alchemy and "unnatural," or illicit methods. The development of astronomy and astrology in the Hellenistic period had an enormous impact on ancient religion and cosmology. The stars and planets were now viewed as divinities, and this led to a population explosion of angels, daemons, and other divine beings that were imagined to inhabit the cosmos.

[31] Iamblichus, *De Mysteriis* V.18.223-224.

Angels and daemons presided over all aspects of earthly life, both mind and matter. They typically resided within the cosmic realm, below the fixed stars that marked the boundaries of nature (also called the realm of Fate), whereas the divine creator existed beyond this boundary. For Zosimus and many others, this boundary expressed divine transcendence rather than an ontological separation between the natural and divine realms, since the divine was seen as the unifying principle of the cosmos. The angels and daemons were viewed as mediators between humans and the divine; they were often identified with the forces of sympathy and antipathy that connected all parts of nature into a unified whole. Late ancient interpretations of this cosmic framework varied greatly, however. Zosimus and his competitors share this basic worldview, but they have different ideas about cosmic sympathy and acquiring knowledge of nature.

As I have shown, Zosimus constantly rails against the daemons and criticizes his rivals for invoking them to aid with their alchemical work. There are several reasons why Zosimus doesn't like the daemons, and foremost among them is that they incite human passions, dragging the soul downward and thus preventing the spiritual ascent that is necessary for understanding nature. Though he acknowledges that daemons are forces of nature and can impart knowledge of nature, they are limited to certain aspects of the cosmos and therefore their knowledge is partial and incomplete. He expresses great disdain for those who have neither the desire nor the spiritual wherewithal to pursue knowledge of nature as a whole. They have no desire to bridge the gap between nature and the divine and thereby experience the unity of all things.

It is difficult to ascertain how Zosimus's competitors would have responded to these charges, since Zosimus gives little information about their worldview or their

techniques, except that they use a type of astrology that involves appealing to daemons to grant favorable times for performing their work. Scholars often construe Zosimus's polemics as a condemnation of astrological determinism, but I disagree, since Zosimus also believes in a type of astrology.[32] Paying closer attention to nature/culture dynamics helps to illustrate the different ways that Zosimus and his competitors map the cosmos. As I discussed in Chapter Three, the type of astrology Zosimus associates with his competitors is represented in apocryphal Jewish texts; Zosimus refers particularly to "books of Solomon," several of which have survived to the present day. In these texts, which contain elaborate daemonologies, the cosmos is intensely personified and individualized. The angels and daemons all have names and their sphere of influence is limited to certain degrees of the zodiac and certain hours of the day and week. One must know the names of all these beings, the precise ways in which they interact with each other (sympathy and antipathy), and the proper times and prayers for invoking them in order to attain their favor in various endeavors. In their own way, these texts, like Zosimus's writings, advocate that wisdom comes from understanding the order of nature and the ways in which all aspects of the cosmos are interconnected and influence each other, but the styles and methods are very different from Zosimus's.

Zosimus acknowledges the existence of angels and daemons, but these beings are not an object of study for him, as they are in the texts described above. When

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[32] For arguments that Zosimus's polemics revolve around astrological determinism, see, for example, Daniel Stolzenberg, "Unpropitious Tinctures: Alchemy, Astrology, and Gnosis According to Zosimus of Panopolis" (entire article); Jack Lindsay, *The Origins of Alchemy in Graeco-Roman Egypt*, 326-327, 337; Jean Letrouit, "Hermetism and Alchemy: Contribution to the Study of *Marcianus Graecus* 299 (=M)", 87-89; and Michele Mertens, "Alchemy, Hermetism and Gnosticism at Panopolis c. 300 A.D.: The Evidence of Zosimus," 170-171.

Zosimus talks about astrology and cosmic sympathy, he refers to the influences of the sun, moon, and stars, rather than to the influences of certain angels or daemons. Most importantly, he does not believe that people can manipulate cosmic powers to act on their behalf. This is "forcing" fate and nature, which he thinks is impossible, since the cosmic entities—the forces of sympathy and antipathy—act according to the will of the creator, not the will of human beings. Thus, he associates the practices of his competitors with magic, which is consistent with the ancient view that magicians try to bend nature to their will. Zosimus views this as the epitome of selfishness, greed, and spiritual imbalance. The confounding of human abilities with divine/natural ones is a violation of what he sees as the proper relationships between nature and culture: such approaches are "unnatural" in his eyes.

Zosimus uses unnatural methods as a foil against which he can assert his own truth claims about nature and cosmic sympathy. Whereas he views his competitors as manipulating nature, Zosimus sees himself as working in harmony with nature. He describes cosmic sympathy in terms of reciprocity, the giving and receiving of energies: "The copper man gives and the watery stone receives; the metal gives and the plant receives; the stars give and the flowers receive; the sky gives and the earth receives….For all things are interwoven and separate afresh, and all things are mingled and all things combine…"[33] Essentially, his distinctions between "unnatural" and "natural" methods is a contest between particulars and universals: he sharply contrasts the notion of a intensely personified cosmos that can be manipulated according to an individual's whims with his own "natural," de-personalized view of the cosmos, which operates according to universal laws that humans can discover and harmonize with.

[33] Zosimus, *On Excellence*, trans. F. Sherwood Taylor, in *The Alchemists*, 58.

Zosimus's natural methods are focused on seeing the universal within the particular, the divine within matter, and his appeals to this "right" view of nature lead him to marginalize worldviews that he thinks project too much of the individual onto the universal laws of nature. He condemns these illicit nature-culture hybridities as magic and bad science, not unlike "moderns" do. By focusing on the nature-culture dynamics in his work, it becomes clear that his polemics are not merely about astrology, nor about discrediting his competitors by calling them magicians. What is at stake is how to properly attain scientific and religious knowledge, which depends on "right" views of nature and the divine, and how the human can best understand and interact with each.

Nature/culture dynamics can be fruitful in studying how science, magic, and religion are demarcated, or blended, by different cultures in different eras. One of the problems with being conditioned by modern separations of nature and culture is that it encourages binary thinking, which leads to a tendency not only to marginalize hybrid worldviews, such as cosmic sympathy, but also to overlook the complexity and nuances of nature-culture hybridity as they manifest in the worldviews of others, and of our own. As I have shown, the dynamics surrounding ancient nature-culture debates are in some ways diametrically opposed to modern ones: ancient traditions are valued more than innovations; religious views of nature are valued more than materialistic ones; Oriental science is held in great esteem *because* of its mysticism. This reversal of modern values makes it difficult to understand ancient perspectives, because the opposition triggers deeply ingrained modern biases. Ancients also negotiated these relationships between nature and culture, and their debates over the hybridity and

separation of these realms led to demarcations between science, magic, and religion. The values and ideologies associated with these domains are always in flux, and recognizing this helps to loosen the rigidity of modern polarizations between nature/culture, modern/primitive, and the biases that are typically associated with these. Since Zosimus inhabits the world of late ancient alchemy, astrology, and cosmic sympathy that is so often marginalized and mystified by "moderns," he provides a fascinating opportunity for examining the tensions between ancient and modern views of magic, science, and religion, and how truth claims regarding nature and culture are foundational in these distinctions. Paying attention to these nature-culture dynamics can help identify stumbling blocks when it comes to understanding the "other," which will yield more nuanced, and less biased, interpretations of ancient perspectives. In the case of ancient alchemy, this is sorely needed.

CONCLUSION

As the first known alchemist to frame his work as a soteriological practice, Zosimus of Panopolis is a pivotal figure in the history of ancient chemistry and religion, though surprisingly little has been written about him. My aim in writing this intellectual history of Zosimus has been two-fold. On one level, this work is meant to explicate his religious thought and nature philosophy, and to contextualize his writings by examining them in light of his professional concerns and the cultural contexts in which he was situated. But this work is not merely intended as a study of Zosimus; his approach to alchemy also serves as a case study for examining broader theoretical issues pertaining to the dissonance between ancient and modern notions of magic, science, and religion, and the problems this raises in the study of ancient religion and science. I have argued that Zosimus's concepts of "nature" and what is "natural" are crucial for understanding his delineations of magic, science, and religion, and that this has broader implications for studying both ancient and modern deployments of these categories, as well as for interrogating modern biases so that ancient perspectives can be understood more clearly.

Zosimus's distinction between his "natural" (*phūsika*) methods of alchemical practice and the "unnatural" (*aphūsika*) methods of his rivals provided the impetus for this dissertation. He frames these as opposing methods for the preparation of "timely tinctures." Zosimus's natural methods involve preparing substances in accordance with celestial, seasonal, and diurnal cycles, which is in keeping with ancient craft traditions.[1] His competitors allegedly use a newer method in which they appeal to the daemons of

[1] Propitious timing is an ancient craft technique. Mesopotamian glass-making recipes dating from 1300-1100 BCE contain instructions for the astrological timing of various procedures. See Chapter One, n. 68.

the zodiac to assist them in their work. Zosimus gives several reasons why this method is inadequate, but the thrust of his argument is that the daemons preside over very precise locations of the cosmos and therefore have only a partial understanding of nature; one should rather appeal to the divine creator, who can reveal knowledge of nature as a whole. This dichotomy between natural and unnatural methods, then, is between differing views of how to harmonize one's work with the larger cosmic forces at play, and how knowledge of nature is best attained.

In late antiquity, spiritual and scientific wisdom were intimately related. It was believed that knowledge of nature was acquired through divine revelation. Behind the visible order of nature lies an invisible order comprised of divine beings that form a hierarchical chain of power linking the heavens and the earth. Scientific knowledge was construed as having penetrated the divine mysteries of nature. This was also a religious ideal, embodied in the figures of scientist-sages like Hermes, Pythagoras, Democritus, and King Solomon, who were immensely popular in Zosimus's era and credited with the authorship of a variety of scientific-religious texts. This cultural emphasis on acquiring scientific and spiritual wisdom is the context in which Zosimus articulates his views of alchemy as a spiritual practice.

Zosimus's writings are not the first to incorporate religious themes, but what makes his writings unique is that earlier alchemical texts make *analogies* between the purification of metals and the purification of the soul, whereas Zosimus takes these connections more literally and integrates them into a unified practice. He recommends several methods for merging the "corporeal" and "spiritual" aspects of alchemy. Some can be practiced in the workshop, such as contemplating how the metals reveal the

divine presence within nature. Other types of meditation, such as quietly examining the soul and quelling the passions, were probably practiced independently, though Zosimus insists that this type of self-examination augments one's work as an alchemist. I focused particularly on his meditations on cosmic sympathy, which are designed to lead the practitioner from the mundane usages and symbolism of a particular metal or natural object into progressively deeper cosmological and spiritual associations, culminating in an encounter with the Demiurge. To attain union with the divine mind of the creator is, for Zosimus and for many other late ancient scientists, philosophers, and religious thinkers, the pinnacle of spiritual and scientific wisdom.

As this study has shown, one's views of cosmology and cosmic sympathy were thought to reveal something about a person's knowledge, piety, and way of being and acting in the world. Zosimus and his contemporaries shared a basic cosmological framework—the Ptolemaic view that the earth is surrounded by concentric planetary spheres, which are bounded by the realm of the fixed stars—but they widely varied in their views of the invisible, divine order that underlies the visible order of nature. This is particularly evident in regards to the various theories of cosmic sympathy circulating in that era, all of which postulate that hidden forces (angels and daemons, in many cases) link the microcosm to the macrocosm and unite all parts of nature, but imagine the relationships of these forces in different ways. These cosmic forces were actively *used*. Zosimus and Iamblichus, for example, used the natural order of the cosmos as a model for the proper ordering of the soul. They also activated the invisible lines of cosmic sympathy as a means of ascending from the particulars of nature to the realm of divine universal truths that lie beyond the fixed stars. Zosimus's rivals, on the other

hand, were accused of manipulating cosmic energies (daemons) and trying to bend them to their will. Such attempts to "force" nature were often associated with magic. Those who focused strictly on the realm of nature, and/or on the divine beings that resided within the cosmic boundaries (as opposed to aspiring to the noetic realms beyond the cosmos), were considered by Zosimus and other philosophers to be spiritually impoverished, enmeshed in worldly concerns, and lacking in their understandings of nature as a whole. As Zosimus often said of his competitors, they know only the things of the flesh, and nothing of the spirit. Whereas the true philosopher, he argued, understands both body and soul, and is able to perceive the divine unity within nature.

Clearly, ideas about nature were very important in ancient demarcations between science, magic, and religion. I have argued that nature is also foundational in modern conceptions of these categories. The modern tendency to conceptually separate nature and culture has led to a suspicion of worldviews in which these domains are more closely intertwined. Cosmic sympathy is a prime example because it is often associated with pre-modern and "primitive" ways of viewing the world, which confuse human ideas about nature with nature as it "really is." This dichotomy has been particularly problematic in the study of alchemy, which is often portrayed by contemporary scholars as an irrational practice and as a type of magic, mysticism, or pseudo-science, as opposed to modern science, which is considered rational because it based on a "correct" materialistic view of nature. By focusing on the ways in which truth claims regarding nature are foundational in distinctions between science, magic, and religion, one can draw out the subtleties and complexities of ancient perspectives,

and identify modern biases that may hinder our ability to understand the "other." My hope is that in this study of Zosimus and early alchemy, the value of such an analysis has been effectively demonstrated.

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