



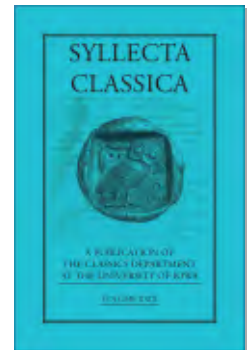
Secrets of the God Makers: Re-Thinking the Origins of Greco-Egyptian Alchemy

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SECRETS OF THE GOD MAKERS: RE-THINKING THE ORIGINS OF GRECO-EGYPTIAN ALCHEMY

SHANNON GRIMES

Abstract: The earliest alchemical texts have an Egyptian provenance and date to the Roman period. Surprisingly little attention is given to the socio-cultural contexts of the craftsmen who produced them. This paper argues that alchemy originated in the Egyptian priesthood among temple metallurgists who were responsible for making cultic objects. Access to metallurgical recipes was restricted, but with the rise of trade guilds in the Roman period, craft secrets began to circulate more freely. The purpose of this paper is to demonstrate that these economic shifts are the best explanation for the emergence of alchemical texts in Roman Egypt.*

Keywords: Greco-Egyptian Alchemy, Zosimos of Panopolis, Metallurgists (Roman Egypt)

Alchemical literature emerged in the first centuries of the common era; it consists mainly of metallurgical recipes (though some refer to jewels and dyeing), with philosophical and religious commentary woven into many of the texts.¹ The prevailing explanation of alchemy's origins

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¹ Copies of alchemical writings dating from the first through eighth centuries were preserved in several medieval anthologies, collectively known as the Greco-Egyptian alchemical corpus. The texts being discussed here date from the Roman period (first–fourth centuries CE), and come from Greek and Syriac manuscripts. The Greek manuscripts are *Marcianus graecus* 299 (tenth or eleventh century), *Parisini graeci* 2325 (thirteenth century) and 2327 (fifteenth century), and *Laurentianus graecus* 86, 16 (fifteenth century); the Syriac manuscripts are Mm 6.29 (fifteenth century), Egerton 709 (fifteenth century) and Oriental 1593 (fifteenth or sixteenth century). For a more

is that Egyptian metallurgists began applying Greek philosophy to their work and developing theories of how to transmute base metals into precious ones.² Although I challenged this conceptualization of transmutation (i.e., turning base metals into gold) in my earlier work on alchemy (Grimes 2006), I never questioned the idea that Greek philosophy was a defining feature of alchemy, but I have since come to view it as problematic because it reinforces Western biases toward science and rationalism and tends to obscure the Egyptian contributions.³ My research focuses on the most prolific of the Roman-era Egyptian alchemists, Zosimos of Panopolis (late third-early fourth century CE), who was a temple scribe and artisan-priest that made statues and other metal goods.⁴ I have recently argued that ancient Egyptian theology and rituals of statue-making are essential to understanding not only Zosimos' work, but the origins of Greco-Egyptian alchemy, which is rooted in these ancient temple traditions (Grimes 2018).

complete list and description of the manuscripts in the Greco-Egyptian alchemical corpus, including Latin and Arabic works, see Mertens (2002 xii–cxii). For a detailed discussion of the Syriac works, see Martelli (2014).

² Since the late nineteenth century, when Berthelot first published his translated compilations of Greco-Egyptian alchemical literature, historians of alchemy have insisted that what makes a text alchemical is that it contains theoretical reflection on the physical changes observed in their work. Greek philosophical theories are usually privileged over religious and “magical” ideas that appear in some of these works. The oldest “alchemical” manuscripts are *P. Leiden X* and *P. Graecus Holmiensis*, known as the Leiden and Stockholm papyri, which were discovered in Thebes in Upper Egypt and date to the late third to early fourth centuries CE, but there has long been debate over whether these can be considered alchemical since they are recipes without any theoretical reflection. However, the recipes overlap with texts that are widely regarded as alchemical, such as the *Φυσικά καὶ Μυστικά* of Ps-Democritus (first–third c. CE). See Halleux 5–14, 24–30; Caley and Jensen 3–4.

³ On this point, see also Moyer, who argues that in scholarship of Hellenistic Egypt, Egypt and Egyptians have taken a backseat to Hellenism, that they have been overlooked as historical subjects, and instead treated as “absent objects of representation” (1–2). He also notes the implicit bias in favor of the “rational” Greeks, as opposed to the “primitive” Egyptians (3).

⁴ On dates for Zosimos, see Mertens's introduction, *Auth.Mem.*, xv–xvi.

The purpose of this article is to propose a different explanation for the appearance of alchemical literature in the Roman period, one that raises the profile of the Egyptian contributions to the development of alchemy, decentralizes the emphasis on Hellenistic theory, and suggests that the answer might be found in socio-economic causes. What is new in the Roman period is not that Egyptian artisans were turning to Greek philosophy, which they had been engaging with for centuries, but the rise of trade guilds in this era, which disrupted traditional temple economies and created new networks for the exchange of materials, ideas, and techniques. In order to bring the metallurgical arts in Roman Egypt into sharper focus, I will draw heavily, though not exclusively, on Zosimos' work. As Baines has noted, very little is known about Egyptian artists, and it is rare to find their perspectives in writing (73, 89). This is true in Greco-Egyptian alchemical texts as well. Zosimos, therefore, is a valuable source for anyone studying metallurgy or artisans in Roman Egypt, since he includes more personal narrative and insight into his profession than any other alchemical author of that period.

Though this article summarizes some of my recent work on Zosimos, the argument I am making here is new. I begin with a discussion of some distinctive features of ancient Egyptian metallurgical arts, which appear in many of the recipes in the Greco-Egyptian alchemical corpus, in order to demonstrate that alchemy is rooted in this tradition. Next, I examine the work of the temple artisans and scribal priests in order to determine where they fit into the priestly hierarchy, to highlight their work as scribes, and to show how Egyptian ideas are foundational to alchemical theory, which helps to dislodge the idea that alchemy is based on Greek philosophy. In the last section I give a brief outline of the rise of trade guilds in Roman Egypt and their connection to the temples. I also outline the economic hierarchies of different types of trade guilds, namely gold-, silver-, and bronze-smiths, because certain classes of metallurgists had more access to precious metals and to temple contracts than others. I conclude with a discussion of Zosimos' comments about trade secrecy, which indicate that temple traditions of secrecy were breaking down, in order to make my overall point: that the emergence of alchemical texts in Roman Egypt is most likely due to shifting socio-economic relationships caused by the rise of trade guilds at that time.

ALCHEMY AND TEMPLE STATUE-MAKING

Although alchemy is often imagined and sometimes defined as the effort to transmute base metals into gold, there is no strong evidence for this in the Greco-Egyptian alchemical corpus.⁵ Hopkins first pointed out in 1918 that alchemical ideas of transmutation are essentially describing changes in color, and not transmutations of one metal into another, but his color theory never gained much traction (531–33).⁶ These ideas are worth revisiting, however, because new evidence has shown that polychromatic techniques were more commonly used by Egyptian artisans than had previously been thought.⁷ As art historian Delange explains, polychromy is a distinctive feature of Egyptian metal statuary in particular, but until recently, scholars had been unable to detect the polychromy because of the natural patinas and corrosion that color metals over time; however, newer developments in microscopy and X-ray analysis have made it possible to identify the subtle, intentional uses of color by the artists (39). These coloration techniques were perfected by temple artisans in the Third Intermediate Period (1070–664 BCE), about a thousand years before Zosimos' time, but the production of polychrome statuary persisted into the Ptolemaic and Roman periods, and artifacts from this era show that a single statue might be made of several different metals and contain a variety of hues, achieved through bronzing and surface treatments, gilding, or inlays (Schorsch 196).

Zosimos makes explicit reference to statue-making in a text called *On the Work of Copper*, where he gives several recipes for making tinctures used in coloring metals, imparting hues of purple, red, coral-pink, yellow, black, white, blue, gold, and silver to the statues (CMA II.6, 222ff.).⁸ He takes pride in his work, claiming that the coloration is so vivid and the

⁵ See Grimes (2006 ch. 1), and Dufault.

⁶ See Hopkins (1925) for a later elaboration of his color theory. Scholars are beginning to return to this idea. On color being the most important quality of minerals for ancient Egyptians, see Beretta 16.

⁷ For a technical description of some initial studies, see LaNiece et al.

⁸ Ancient texts in the CMA are in Syriac and Arabic, translated into French by Duval. All references to CMA in this paper are from the Syriac collection, and I rely on Duval's French translation unless otherwise noted.

form so perfect that when people see the statues, they are frightened and believe they are living beings.⁹ He mentions statues of Agathodaemon, Fortune, Mother Earth, and the god of the Nile, all of which were popular deities in the Roman period, as well as figurines likely used as votive offerings, including male and female figures, animals, birds, trees, and ears (so the gods will hear one's prayers).¹⁰ In addition to polychromy, the Greco-Egyptian alchemical corpus contains many recipes for making metallic inks and for blackening metals, both of which are distinctive features of Egyptian statuary.¹¹ One of the unattributed books in the Syriac alchemical manuscripts, *Letter Beta*, attests to this practice and gives several recipes for "writing" with precious metals, many in the form of encaustic inlays using liquid adhesives, gum arabic, or fish glue: "With this, you can write letters of gold on vases <...>, on statues, and on all that you wish, so as to make it look like golden letters."¹² Some statues are elaborately "tattooed" with hieroglyphs and divine symbols, using metallic inks; this is often found on blackened cult statues known as black bronzes, where the gold and silver writings create a luminous,

⁹ CMA II.6.2, 223. Showing fear and awe before a divine statue is a pious religious response, and I interpret Zosimos' statements to mean that the artisans were effective in creating these holy objects. On fear before statues, see Hornung, 197; Ritner, 24.

¹⁰ Ibid. Martelli (2017, 214–15) argues that Zosimos doesn't approve of these statues, because in this passage he chastises his rival, Neilos, for admiring things that are unworthy of admiration – presumably these gods. Indeed, this is a tricky passage. As I point out elsewhere, there are scribal notes in the margins of this page expressing disapproval of idols, so this passage might contain interpolations (Grimes 2018, 233). If the negative opinions are Zosimos', it could be that these statues, which are popular Hellenistic deities, represent a departure from (or inferior form of) what Zosimos considers a more traditional and nobler form of the art. Either way, my aim in this article is not to debate Zosimos' opinions of these statues, but to demonstrate that divine statues are alchemical *products*.

¹¹ For metallic inks, see for example *P.Leid.* X.33, 38, 44, 49, 51, 77. Recipes for blackened bronze and silver can be found in CMA II.6, 222ff.

¹² CMA I.2.1 (*Letter Beta*). My translation of Duval's French: "Avec ceci, écris des lettres d'or sur des vases <...>, sur des statues et sur tout ce que tu voudras, de façon à faire paraître les lettres dorées."

scintillating contrast against the black background.¹³ According to Pliny the Elder (1st c. CE), the Egyptians customarily colored their silver statues black “so as to see portraits of their god Anubis in their vessels” (*ut in vasis anubim suum spectet*, *NH* XXXIII.46).¹⁴ 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” (*unde transiit materia et ad triumphales statuas; mirumque, crescit pretium fulgoris excaecati*, *Ibid.*). Zosimos claims that the recipes for blackening silver were closely guarded, and that oaths of secrecy were mandatory to preserve its mystery.¹⁵ The high market value of these blackened cult statues is attested as far back as the Bronze Age, where in ranked lists of religious offerings, black bronze alloys are listed behind gold and silver in value, but before bronze and copper (Delange 41).

Derchain’s work on the House of Gold at the Temple of Hathor at Dendera is pertinent to studies of alchemy. This temple (which is near Panopolis in the Thebaid region) has ascending and descending staircases that lead to the roof of the temple. The entrance to a goldsmith’s *atelier*, called the “House of Gold,” is located on a landing off this stairway. Lower ranking artisans were forbidden to enter this room, which is where initiated priests put the finishing touches on the cult statues and performed the Opening of the Mouth ceremonies that rendered them capable of receiving divine presence.¹⁶ The House of Gold, then, is where rituals of god-making occurred. In his study, Derchain speculates that alchemy might have stemmed from these practices, and I couldn’t agree more.¹⁷ Zosimos’ religious works focus almost exclusively on methods for realizing the divine presence within the material world and within oneself. His allegory of the alchemical opus, *On Excellence*, contains several allusions to the Opening of the Mouth rituals used in

¹³ On black bronzes see works by Delange, Giumlia-Mair, LaNiece et al., Hunter, and Schorsch.

¹⁴ Trans. H. Rackham.

¹⁵ CMA II.6.4.

¹⁶ Details of the Hathor Temple at Dendera from Derchain 220–23 and Verner 453–54.

¹⁷ See Derchain 224; Fraser (2007) 36–37.

both statue-making and embalming rites, and he likens the process of coloring a metal gold to the process of becoming enlightened (*Auth. Mem.X*).¹⁸

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. In Egypt, gold was known as the “flesh of the gods”; the wealthy deceased would be buried with gilded skin and gold-plated body parts so that they might have eternal life and light in the darkness of death (Gessler-Löhr 675–76). Even though divine statues were polychromatic and made from several different metals, gold had the highest theological significance because it was associated with the divine creator, the solar god Re, who was the ruling god in the Egyptian pantheon.¹⁹ The alchemical belief that base metals can be transmuted into gold — which is found in Arabic and European alchemy, but not in the Greco-Egyptian corpus — likely stemmed from religious ideas about gold.

ARTISAN-PRIESTS AND SCRIBES

Dieleman outlines six priestly offices that were in place in the Ptolemaic and Roman periods, which helps clarify where Zosimos and other artisan priests may have fit within the overall temple hierarchy. In descending order of rank:

- 1) The High Priest, who was the administrator of the temple complex. He was usually assisted (or supervised) by a royally appointed overseer.
- 2) God’s servants (whom the Greeks called *προφῆται*, prophets) who had religious authority and conducted the cultic rituals at public festivals.
- 3) Clothing priests, who washed and dressed the statues each day. This group is also referred to as “overseers of secrets, purified ones of the gods.”²⁰

¹⁸ *On Excellence* (also known as *On Virtue*, or *The Visions of Zosimos*) is one of the few Zosimean texts translated in full into English. See Taylor. For an exegesis of this text that highlights the connection to Egyptian rituals and texts, see Grimes (2018) 131–51.

¹⁹ Aufrère, vol. 2, 372–73; 389–90; 803.

²⁰ Dieleman 207.

4) Lector priests, scribes who were responsible for reading ritual texts and ensuring correct performance of rituals, hymns, and invocations.

5) Temple scribes of the House of Life. They produced, collected, and translated religious and scholarly literature, including medical and magical texts.

6) Lower ranking priests are grouped together in this last category.²¹

Artisans and craftsmen were under the supervision of the House of Life (no. 5 above), an institution which also had a role in temple administration; its priests were scholar-scribes and senior artisans who worked in annexes that housed temple libraries and scriptoria.²² Zosimos' work as a translator and collector of alchemical texts, as well as his familiarity with a wide variety of philosophical, religious, and technical works, suggests that he was a senior artisan and/or scribal priest from the House of Life. The precise connection between scribe and artisan is unclear. Some scholars have argued that Greco-Egyptian alchemists were philosophers and scribes, and not practicing metallurgists, but Zosimos appears to be skilled in all of these enterprises.²³ So his role

²¹ Dieleman 206–08. As Dieleman notes, this list comes from the Ptolemaic-era Memphis Decree (196 BCE), and is also found in the Canopus Decree (238 BCE) and the Roman-era Gnomon of the Idios Logos (*P.Oxy.* XLII 3014: first century CE; *BGUV* 1210: second century CE).

²² Finnestad 228; Frankfurter 239–241. On senior artisans as having priestly rank in the House of Life, see Quack 290. Finnestad indicates that under Ptolemaic and Roman rule, the scholarly activity of the temples took on a special significance because they had become “the chief official repositories of Egyptian learning” (191). See also Gardiner 159; Sauneron 133–34.

²³ Needham famously distinguished between “aurifaction” by the real gold-makers or metallurgists, and “aurifiction” by gold-fakers who erroneously believed they could transmute base metals into gold, and he puts the Greco-Egyptian alchemists in the “aurifiction” category (10–11). More recently, Martelli (2011) has raised similar questions about the alchemical texts, claiming that the authors (including Zosimos) seem more interested in the intellectual text-oriented aspects of alchemy than in experimenting with metals, and he proposes that there was a separation, yet dialectical relationship between scribes and craftsmen (310–11). On Zosimos as a skilled metallurgist, see Stillman 167.

seems to have been that of a master craftsman, in charge of collecting, interpreting, and translating recipes for the lower-ranking artisan-priests (no. 6 above) that were overseen by this branch.²⁴

Zosimos refers to “masters” and “prophets” of old, who exhibited great skill as interpreters of alchemical texts (CMA II.6.4).²⁵ In pharaonic times, the priests numbered 1–5 in the list above all held the rank of prophet, or servants of God; they were divided into four ranks, with First and Second Priests serving as the administrators of the temple (equivalent to nos. 1–2 above), and the Third and Fourth Priests performing the daily cult rituals and other specialized tasks (nos. 3–5 above).²⁶ The scribes of the House of Life were lower ranking prophets, but the lector priests (no. 3 above) were not always counted among this class.²⁷ Priestly roles and titles shifted over time. Master craftsmen like Zosimos had the title of prophet in earlier times, but maybe not in the Roman period, though their position in the priestly hierarchy — in the lower ranks of the higher echelon of priests — seems to have stayed constant. It should be noted that Zosimos references the pharaonic priestly hierarchy in his work, not the Greco-Roman era hierarchy as outlined by Dieleman.²⁸

In the Roman period, temple scribes were synthesizing local and regional differences in Egyptian thought in order to present a more universal account of Egyptian religion (Dunand and Zivie-Coche, 234–35). As Frankfurter observes, the scribes from the House of Life were essentially engaged in “updating ancient materials,” revising ancient texts to incorporate new situations, while preserving archaic paradigms

²⁴ On artisans as lower ranking priests, see Sauneron 70; on “masters,” or master craftsmen supervising teams of artisans in the temple workshops, see Eaton-Krauss 138; Scheel 59–60.

²⁵ CMA II.6.4, 232–34. My translation of Duval’s French: “Ainsi que nous l’avons dit, les divers symboles 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.”

²⁶ See Teeter 25–27; Sauneron 56–65.

²⁷ Sauneron 61; Frankfurter 212–14. Frankfurter discusses the role of the lector-priest as an intermediary between temple and local traditions, serving as a freelance ritual expert and ministering to people in the town or village. See also Marx-Wolf.

²⁸ See, for example, Zosimos’ *Final Account* (CAAG III.51, 239–46).

(241). They were also reading and translating texts from all over the Mediterranean and Near East, harmonizing these ideas with Egyptian thought, and expressing them in Greek, the *lingua franca* of their day. Cultural synthesis was even more prominent in the Roman period: the Hermetic literature that dates from the beginning of Roman rule is a good example of this synthetic tendency, blending Egyptian traditions with Greek and Jewish influences.²⁹ Zosimos, who was well versed in the Hermetic tradition, also exhibits this synthesis and universalism, at times intentionally trying to harmonize Greek, Hebrew, and Egyptian approaches to metallurgy and metaphysics.³⁰

In some of the alchemical texts, the references to Hellenistic philosophy could be part of scribal efforts to synthesize cultural knowledge, especially since they don't seem to be used in any consistent way. Cristina Viano, who has made the most significant investigations into Greco-Egyptian alchemists' use of Aristotelian and Platonic theories of matter, points out that Zosimos and other alchemists seem to be harmonizing different aspects of Aristotle and Plato, using them selectively in ways that show agreement with their alchemical techniques, but that they were not using Greek philosophy in any systematic way for experimental verification of their work.³¹ Olivier Dufault concurs, adding that early alchemists did not adhere to one particular school of thought, but often combined elements from Aristotle, Plato, and Stoicism, whose theories contradict each other. He writes:

It seems to make little sense to continue assuming that alchemical writers were operating on philosophical grounds, especially if the result is to conclude that they were bad philosophers. Greek philosophy is not the single interpretive key of the Greek alchemical corpus; rather, philosophy was only one of the systems of reference within which alchemical writers described dyeing and metallurgical practices (225).

It is understandable that scholars have looked primarily to Greek philosophy as a theoretical foundation of alchemy, because the Greco-Egyptian alchemical literature has copious references to Greek natural

²⁹ See Fowden 27, 36–37; Dunand and Zivie-Coche, 234–35.

³⁰ *Auth.Mem.* I.12–16.

³¹ Viano (2005) 93, 107. See also Viano (1996).

philosophy, while explicit references to Egyptian ideas are rare. But some of the most prevalent theories of nature in the alchemical texts can be traced to Egyptian thought. Fundamental to alchemical theory is a belief in the unity of nature and cosmic sympathy and antipathy, whereby all parts of the universe are linked together by invisible forces, which naturally attract some parts together and naturally repel others. This belief is encapsulated in oft-repeated alchemical phrases (formulated in a variety of ways) such as “nature delights in nature, nature conquers nature, nature commands nature” (ἡ φύσις τῇ φύσει τέρπεται, καὶ ἡ φύσις τὴν φύσιν νικᾷ, καὶ ἡ φύσις τὴν φύσιν κρατεῖ), and “One is the All and through it is All and to it returns the All” (“Ἐν τὸ πᾶν καὶ δι’ αὐτοῦ τὸ πᾶν καὶ εἰς αὐτὸ τὸ πᾶν”).³² These slogans are an expression of cosmic sympathies and antipathies: the powers of one “nature” to attract, repel, or transform. Cosmic sympathy is a pan-Mediterranean theory, interpreted in a variety of ways, that is also found in ancient Egyptian thought. Garth Fowden points out that in Egyptian religion, cosmic sympathy “manifests itself as the magical power, *heka*, that pervades the universe, and in the divine, especially solar, energies that enliven the whole world” (76). *Heka*, which is often translated as “magic,” is the force that links all phenomena and sympathetic powers into one unified whole; it can be harnessed for many purposes, whether benevolent or malevolent (Ritner 17–27; Pinch 162–63). In addition to being a spiritual force, *heka* was also viewed as one of the oldest and most powerful gods, who was the first creation of the primeval creator-god and can be seen as the hypostasis of his creative power (Ritner 17).

Another important concept in early alchemical texts is the notion of working in harmony with the cosmic order. This is the basis for Zosimos’ “natural methods” of practicing alchemy, which make use of propitious timing, performing alchemical operations at particular times of the day, month, or year, or according to certain planetary alignments, in order

³² The “nature delights in nature...” slogan can be found, for example, in the *Φυσικὰ καὶ Μυστικά* attributed to Democritus (Martelli 2013, S11). The “One is the All...” cited here is a partial quote from Zosimos, *Auth.Mem.* VI; CAAG III.18.1 (169). The “nature delights in nature...” slogan is also found in the surviving fragments of the astrological treatise of Nechepso-Petosiris (ca. 1st c. BCE). See Bidez and Cumont 244–46.

to ensure their success.³³ This emphasis on being in harmony with the cosmic order is at the very core of Egyptian religious practice: the concept of *maat*. *Maat* is the principle of divine order, evident in the orderly motions of the heavens, the regularity of the changing seasons, and in the laws of nature; it is the ideal state of perfection that all of creation should strive for, because it is in harmony with the will of the creator (Hornung 213). *Maat* is also the foundation for Egyptian rituals, laws, and ethics (Morenz 115–17). The ideals of *maat* permeate Zosimos' work, and it can be found in other alchemical texts, as well.³⁴

In addition to the concepts of *heka* and *maat*, Egyptians had extensive theologies of metals and the natural world, all of which informed ancient temple metallurgy.³⁵ Seen in this light, Greek philosophy is not necessarily the theoretical inspiration for Egyptian alchemy, though it certainly had a place in alchemical thought.

TRADE GUILDS AND TEMPLE SECRECY

If Greek philosophy isn't the reason for the appearance of alchemical literature in the Roman period, then other explanations must be sought. A broader examination of the metallurgical profession in Egypt proves fruitful here, because in the Roman period trade guilds were growing in number and in economic power. I am limiting my discussion here to the decorative arts of gold-, silver-, and bronze-smithing, because these have the closest parallels to alchemy as practiced in the temples. I will briefly introduce trade guilds and their connection to temples, and then proceed to a discussion of craft secrecy in Zosimos' works in order to demonstrate that it was breaking down, probably due to the new economic networks that had arisen due to the trade guilds.

³³ For detailed discussions of the distinctions Zosimos makes between natural and unnatural methods, see articles by Stolzenberg (1999); Fraser (2004); and Grimes (2018 ch. 4).

³⁴ On traces of *maat* in Zosimos' work, see *Auth. Mem.* I and XIII.1, for example. Other Greco-Egyptian alchemical texts that emphasize working harmony with the cosmic order (using natural methods), and which reflect the concept and ethos of *maat*, include *The Dialogue of Cleopatra and the Philosophers* (CAAG IV.20, 289–99); and *Isis the Prophetess to Her Son Horus* (CAAG I.13, 28–33).

³⁵ See Aufrière's two volume work on this subject.

In pharaonic Egypt, precious metals and gems were under strict control of the state and usually stored in temple treasuries. Artisans' workshops were located on (or annexed to) temple properties because the craftsmen (artisan-priests and their overseers) needed to be in close proximity to raw materials like precious metals and gems, along with tools and equipment that belonged to the temple (Eaton-Krauss 138). Some of these workshops could be quite extensive, like the well-documented aggregation of workshops near the temple complex of Karnak at Thebes, and appear to have served the needs of all the temples in town, or perhaps even several towns (Eaton-Krauss 139–40). Although artwork in tombs and temples often depicts metalworkers, no ancient foundry was discovered until 1985; this metalworking site, located at the funerary temple of King Seti I in the Theban necropolis, dates to the Ptolemaic period and is probably similar to what Zosimos and his colleagues would have been familiar with a few centuries later (Scheel 25). Bernd Scheel gives a brief description:

Four mud-brick structures of different lengths, each built of two parallel brick settings, were excavated. These served as hearths for the crucibles; the smaller hearths were 1.4 metres (5 feet) in length and the two larger ones 7 metres (23 feet). A small hearth had room for one crucible, a larger one was built to hold about five crucibles.... It was possible, therefore, either to mass-produce many objects or to cast large ones at this site (25, 27).

This cast metal would have been further processed, shaped, or sculpted by artisans in separate workshops, like the cluster of workshops mentioned above near the Temple of Karnak in Thebes.

Most workshops were temple workshops, under royal control; workshops could also be owned by the state or by high-ranking government officials, but not by private individuals (Scheel 59). This dynamic began to change during Ptolemaic rule, which is when independent goldsmiths are first attested (Ogden 57–59). Craft guilds, which began to establish in the Roman period, appear to have evolved out of trade networks that were attached to the temples (Alston (1998, 172). These associations were typically numbered between ten and twenty-five members. (Ventecinq 2010, 278). They exercised control over trade, both locally and regionally; they also regulated membership and

local competition and guaranteed the quality of members' products.³⁶ Temples and trade guilds collaborated and overlapped in some areas. Trade guilds, for example, played an important role in upholding and maintaining religious traditions; they typically honored a patron deity and helped support the cult of that deity as well as the local temple.³⁷ The temple, in return, would be an important source of income for metallurgists, commissioning metal statues, ritual objects, temple decoration, and other goods. Most lower-ranking Egyptian priests served only part-time, working month-long shifts at the temple four or five times a year, so the majority of their time was spent working in occupations outside of the temple (Teeter 35). In the Roman period, then, it is likely that the lower ranking artisan-priests would also belong to a trade guild, though perhaps not higher ranking scribal priests like Zosimos, since the Gnomon of the Idios Logos forbade priests from working in profane occupations.³⁸

Data from Roman Egypt indicates that goldsmiths and silversmiths were organized into two distinct groups, each with its own guilds (Burkhalter 125–32). Goldsmiths (χρυσοχόοι) had a close relationship with the temples, and some of their higher ranking members functioned as overseers who would contract with other metalsmiths and artisans to make goods and decorations for the temples and other public buildings, as well as for private clients.³⁹ Silversmiths (ἀργυροκόποι) specialized in statuettes, jewelry, decorative items, and tableware (Burkhalter 125). Bronzsmiths (χαλκοτύποι) form a third category, but in a looser sense because generic terms for bronze workers were applied to a diverse group of metalsmiths, whose products ranged from statues, crockery, amphorae, weapons, tools, locks and keys, as well as metal

³⁶ Van Minnen 57–58; Alston (1998) 172; and the classic study by Boak.

³⁷ Venticinque (2016) 114–21; Van Minnen 52. Long 75–76; Frankfurter 72–73; and Alston (2002, 207–18). In the first century of Roman rule, *collegia* were banned unless they had some religious purpose, including collections to help pay for burials for the members. See Arnaoutoglou.

³⁸ Law is at ch. 71, *BGU V* 1210; *P.Oxy.* XLII 3014. Cf. Alston (2002) 200.

³⁹ See Burkhalter 130–32; van Minnen 45, 57–58; Thomas 30.

for boats.⁴⁰ Of all the metalsmiths, goldsmiths were the wealthiest and most versatile group, able to work with many types of artists and sell metals other than gold; for example, a second century goldsmith's receipt includes a charge for a silver statuette.⁴¹ Silversmiths and bronze workers seem to have been less involved as overseers of artisans outside of their own guilds (which might account for their lower income levels), and their ability to sell different metals may have been more restricted than that of goldsmiths. Since the early alchemical recipes indicate that their authors were working with a wide array of metals, gems, dyes, and other materials, I surmise that these texts were circulated primarily among goldsmiths. High-ranking goldsmiths, who were the contractors of temple projects, would probably have worked closely with scribal-priests and master craftsmen like Zosimos.

Craft secrecy was important to temples. As mentioned earlier, access to temple resources was restricted: one had to be initiated and of proper rank in order to be admitted into certain rooms of the temple, such as the House of Gold or the treasury. In a long treatise called *Final Account*, Zosimos discusses temple traditions of secrecy. He attributes the origins of such practices to the fact that Egypt rulers exercised strict control over mining, smelting, and other types of work dealing with precious metals; those who did not abide by the laws of secrecy were punished (CAAG III.51.1, 239–40). He claims that the priests of old 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 if anyone dared to confront the shadows of the sanctuary in order to obtain forbidden knowledge, he would not be able to decipher the characters, despite his audacity and trouble” (αὐτοὶ δὲ ἐν ταῖς στήλαις αὐτὰ ἐνέγλυψαν ἐν τῷ σκότει καὶ τοῖς μυχοῖς... ἵνα κἂν τις τολμήσας ἐπιβῆναι τῶν μυχῶν τοὺς σκότους, τῶν πλημμελεμένων ἐπιλύσεων, μὴ εὖρη ἐπιλύσασθαι τὸν χαρακτῆρα μετὰ τοσαύτην τόλμην καὶ κάματον, CAAG III.51.5., 242–43).⁴² According to Zosimos, some

⁴⁰ Burkhalter 126, 128. *P.Berl.Bork.* has separate listings for a locksmith (κλειδοποιός) and an unspecified metallurgist (μεταλλουργός; perhaps an overseer of mines?), but no blacksmiths/ironworkers are listed. This could be due to the fact that *P.Berl.Bork.* is incomplete. In ancient Greek, variants of the term χαλκεύς (bronzesmiths) could be used to apply to all metalsmiths, including ironsmiths and goldsmiths. See Lindsay 226.

⁴¹ *P.Mil.Vogl.* II 102, cf. Burkhalter 131.

⁴² Based on Lindsay's English translation, 335–36.

metallurgists have been critical of priests for withholding certain recipes. “Their reproaches are unjust,” he says:

οὐ γὰρ ἡδύναντο μέμφοντες τῶν βασιλέων Αἰγυπτίων, καὶ τὰ πρωτεῖα ἐν προφητίᾳ καυχῶντες, πῶς ἡδύναντο ἄλλοις ἀναφανδὸν μαθήματα κατὰ τῶν βασιλέων δημοσίᾳ ἐκμηνύσασθαι καὶ δοῦναι ἄλλοις πλούτου τυραννίδα; οὐδὲν ἡδύναντο ἔξω δίδουν, ἐφθόνουν γάρ.

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 sovran [sic] power of wealth? Even if they could have done it, they would not, for they were careful of their secrets.⁴³

Zosimos’ references to royal monopolies on gold working are consistent with ancient traditions of metals being under royal control, but he might also be thinking of the tightening of royal restrictions on metals that occurred under Ptolemaic rule, due to revolts in the gold mining regions of Upper Egypt.⁴⁴ Since the earliest alchemical texts date from around the time of the ascendancy of Roman rule in Egypt, it may have

⁴³ CAAG III.51.2, 240. Lindsay’s English translation, 335.

⁴⁴ Festugière Vol. I, 276, n.1. This increased control was likely due to the frequent revolts in the gold mining regions of Upper Egypt (Klemm, Klemm, and Murr 656). Other scholars have argued that Zosimos could be responding to Emperor Diocletian’s alleged banning of books dealing with *chēmia* (χημία) or the preparation of gold and silver, in the year 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 (Hopkins 1933, Appendix II).

Zosimos locates this “jealousy of the kings” in ancient times, however, and Diocletian’s edict would have been a more current event (if it had even happened yet), so this is unlikely. Moreover, it is difficult to ascertain the context of Diocletian’s banning of these books. Would this have impacted temple artisans like Zosimos, or other types of metalworkers, such as those who minted coins for the state? Diocletian did initiate a major currency reform in Egypt in 296 (Bagnall 330).

been the case that it was only possible to circulate these trade secrets once the Ptolemaic government had collapsed. But there would probably be no reason to circulate them if it hadn't been for the new commercial networks that were being formed as trade guilds rose to prominence.

Trade guilds, like temples, were structured hierarchically, and in some cases, one entered the guild and moved up in its ranks through a series of initiations; sometimes this involved vows of secrecy for the transmission of trade secrets, though this was not always the case (Long 74). Zosimos mentions that Hebrew alchemists had disseminated some of their craft secrets, though he also notes that certain formulas were still closely guarded and had never been revealed by either Egyptians, Hebrews, or Greeks (CAAG III.51.3, 240–41). Zosimos' writings indicate that there was debate in his day about the need for secrecy. He is actually quite critical of secrecy, claiming that it fosters greed and misinformation. For example, he chastises some of his priestly colleagues for pretending to be experts, even though they haven't studied the ancient scripts. They use initiation and craft secrecy as a means of gaining status and attracting apprentices, and they've deliberately mystified or omitted important information from ancient texts, making this available only to initiates, thus rendering the ancient recipes useless (CMA II.8.1, 238–40). He complains that they have "spoiled the books of chemistry" and "drowned in a great ocean the writings of the science of nature."⁴⁵ He tells his dear friend, Theosebeia, who appears to have been the head of a trade guild, that she shouldn't require oaths of secrecy from her disciples: "If secrets are necessary," he writes, "it is all the more necessary that everybody should possess a book [of recipes], which should not be kept hidden."⁴⁶ To be a master craftsman requires a great deal of knowledge, skill, and experience, and veils of secrecy can be a way of protecting this knowledge as well as feigning it. Zosimos seems to be saying that initiation is no guarantee that a person will have the requisite knowledge or experience to be able to interpret the recipes. Craftsmen will have a better chance of accurately explaining and preserving the proper methods if they are free of mystification.

⁴⁵ CMA II.8.1, 239. My translation of Duval's French: "Non seulement ils gâtèrent les livres de la chimie (koumia); mais ils en firent des mystères. Le Philosophe dit qu'ils noyèrent dans un grand océan les écrits de la science de la nature."

⁴⁶ Ibid.: "Si les mystères sont nécessaires, à plus forte raison faut-il que chacun possède un livre de chimie (koumi), qui ne soit pas tenu caché."

To conclude: in Zosimos' era, the old temple traditions of craft secrecy and initiatory transmission of knowledge were loosening due to the increasing privatization of metallurgy. Temples and trade guilds needed to share recipes and techniques because they were contracting with each other, though they still kept some craft secrets. Rather than looking to Greek philosophy to explain the origins of alchemy, scholars should look more closely at the cultural and professional context of ancient metallurgists — how they lived and worked — and especially at the economic changes brought about by trade guilds, which provide a more plausible explanation for the appearance of alchemical texts in the Roman period. A thorough study of the metallurgical professions and trade networks in Roman Egypt, and how they pertain to alchemy, is beyond the scope of this paper, but I think it is a fruitful direction to pursue, one that has potential to change the way we understand the origins of Greco-Egyptian alchemy.

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