

Transmuting Sericon: Alchemy as “Practical Exegesis” in Early Modern England

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ABSTRACT

An influential strand of English alchemy was the pursuit of the “vegetable stone,” a medicinal elixir popularized by George Ripley (d. ca. 1490), made from a metallic substance, “sericon.” Yet the identity of sericon was not fixed, undergoing radical reinterpretation between the fifteenth and seventeenth centuries as Ripley’s lead-based practice was eclipsed by new methods, notably the antimonial approach of George Starkey (1628–65). Tracing “sericonian” alchemy over 250 years, I show how alchemists fed their practical findings back into textual accounts, creating a “feedback loop” in which the authority of past adepts was maintained by exegetical manipulations—a process that I term “practical exegesis.”

INTRODUCTION

What is “sericon”? In fifteenth-century England, the term was used in alchemical writing to denote a metallic body: the calx or ash of “adrop.” Adrop was also known as the “Green Lion,” and sericon was thus the “Blood of the Green Lion.” Together, these expressions provided a group of related cover names, or *Decknamen*, used by alchemical authors to disguise the true identity of their materials and processes. In isolation, such names do not seem particularly helpful to the modern historian. Yet early modern alchemists also experienced perplexity and frustration when faced by these exegetical barriers to praxis. One solution was to import knowledge from other sources—including their own practical observation—in order to decipher the obscure instructions of their sources. Over time, the meaning of particular *Decknamen* changed, allowing historians a glimpse of the methods by which alchemical practitioners tested, amended, and adapted their earlier authorities in light of their own experience.

The identity of sericon is significant because this term was used to denote the *prima materia* of the “vegetable stone,” a powerful alchemical elixir thought to heal sickness and prolong human life. The vegetable stone was one of the core pursuits of

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English chemical medicine, and the identity of sericon was therefore key to success in this pursuit. Yet sericon's nature was not fixed. Both its identity and the alchemical practice it represented underwent radical reinterpretation between the fifteenth and seventeenth centuries. One outcome of that reinterpretation was that, over time, the original practice came to be eclipsed by other methods and materials. This eclipse is one reason why we find few traces in modern scholarship of either sericon or the medicinal vegetable stone. Indeed, pre-Paracelsian chemical medicine remains relatively little studied in an English context, in comparison to other alchemical pursuits, particularly chrysopoeia (gold making).¹

In this chapter, I shall use sericon as a case study for examining a problem faced by historians of science: the difficulty of isolating and tracking changes in chemical ideas, practices, and nomenclature over long periods, while avoiding anachronism. Alchemical receipts, like other genres of "secret," enjoyed a certain social mobility and exchange value in early modern Europe. Copied, excerpted, swapped, and annotated, procedural instructions could be "tweaked" to reflect the taste, experience, and wider reading of their copyists.² Yet such adjustments, a common feature of recipe collections, are also encountered in more substantive alchemical treatises—reflecting the particular character of these writings, in which key terms are frequently encoded or concealed, demanding an element of translation. The resulting alterations influenced the character of early modern practice yet easily pass unnoticed in the present day: since many alchemical texts were printed relatively late in their "life cycle," the versions most readily available to scholars may capture a moment long after their original meaning changed. In such cases, modern readings of late medieval alchemical writing may unwittingly be shaped by the views of sixteenth- and seventeenth-century glossators.³

Identifying these shifts in meaning brings other benefits. In recent years several scholars, notably William Newman and Lawrence Principe, have unpacked alchemical allegories to show that even seemingly fanciful accounts may disguise workable chemical procedures.⁴ Alchemical writers employed well-established *Decknamen* to confer authority on their own writings by signaling a relationship with venerable predecessors, while also retaining a certain flexibility of interpretation.⁵ By teasing

¹ Notable exceptions include Charles Webster, "Alchemical and Paracelsian Medicine," in *Health, Medicine and Mortality in the Sixteenth Century*, ed. Charles Webster (Cambridge, 1979), 301–34; Michela Pereira, "Mater Medicinarum: English Physicians and the Alchemical Elixir in the Fifteenth Century," in *Medicine from the Black Death to the French Disease*, ed. Roger French, Jon Arrizabalaga, Andrew Cunningham, and Luis Garcia-Ballester (Aldershot, 1998), 26–52; Linda Ehrsam Voigts, "The Master of the King's Stillatories," in *The Lancastrian Court: Proceedings of the 2001 Harlaxton Symposium*, ed. Jenny Stratford (Donington, 2003), 233–52.

² I borrow the term from Elaine Leong, "Tweaking as Creating: Recipes and Knowledge Production in Early Modern England" (paper presented at "Alchemy and Medicine from Antiquity to the Enlightenment," Centre for Research in the Arts, Social Sciences and Humanities, Cambridge, 22–24 September 2011).

³ Through intertextual relationships, originally distinct works may also come to influence one another over time. See Anke Timmermann, *Verse and Transmutation: A Corpus of Middle English Alchemical Poetry* (Leiden, 2013).

⁴ William R. Newman, *Gehennical Fire: The Lives of George Starkey, an American Alchemist in the Scientific Revolution* (Cambridge, Mass., 1994), chap. 4; Lawrence M. Principe, *The Secrets of Alchemy* (Chicago, 2012). Alchemical allegories, of course, encapsulated meanings beyond the merely practical: see, inter alia, Barbara Obrist, *Les débuts de l'imagerie alchimique: XIV^e–XV^e siècles* (Paris, 1982).

⁵ See William R. Newman, "Decknamen or Pseudochemical Language? Eirenaeus Philalthes and Carl Jung," *Rev. Hist. Sci.* 49 (1996): 159–88, on 164–5.

apart these interpretative layers, we may also catch glimpses of how alchemy was conceived and practiced at different historical moments—of the ways in which practice produced chemical knowledge, while being shaped and reported according to the conventions of an established textual tradition. Interventions in the transmission of a text may also mark points at which early modern practitioners diverged from their sources and sought to identify solutions compatible with their own experience, while still retaining the authority of their predecessors.

In the process, they faced similar exegetical challenges to those encountered by modern scholars attempting to decipher the various levels of meaning encountered in this demanding body of literature. Alchemical books and manuscripts are often encrusted with annotation: evidence of readers' attempts to trace references and distill workable practices from their obscure and sometimes contradictory contents. Each generation of practitioners grappled with the challenge of understanding those that came before: rendering authoritative pronouncements down into coherent and, importantly, *replicable* procedures. Their findings fed back, in turn, into the textual tradition, as earlier sources were glossed to accommodate practical knowledge, and new observations framed using the language of established tropes. In the process, meanings shifted, and terms were reinterpreted in light of textual exegesis and practical experience—a feedback loop that I term “practical exegesis.” Yet the retention of authoritative language often serves to mask these practical interventions. To trace an alchemical process over time, it is therefore necessary to understand not only the nature of the original practice but also subsequent stages in its reception.

“WHICH BY MASTERS IS CALLED SERICON”

Late fifteenth-century England provides a fertile site for examining changes in alchemical ideas and practices. From the midcentury, English alchemy was enriched by an influx of treatises pseudonymously attributed to “Raymond”: the Majorcan philosopher Ramon Llull (commonly anglicized as Raymond Lull; ca. 1232–ca. 1316).⁶ Unknown to their readers, the core works of pseudo-Lullian alchemy had in fact been composed at different times and by different people, who sometimes proposed incompatible goals and methods. Identifying and reconciling points of conflict were therefore inevitable and necessary tasks for commentators such as George Ripley (d. ca. 1490), canon-regular of Bridlington Priory in Yorkshire, and perhaps the best-known expositor of pseudo-Lullian alchemy.⁷

Ripley's engagement with “Raymond” is particularly evident in his *Medulla alchimiae*, or “Marrow of Alchemy” (1476).⁸ This Latin treatise is addressed to a high-ranking prelate, often identified (although not in the earliest manuscript copies) as

⁶ On pseudo-Lull, see particularly Michela Pereira, *The Alchemical Corpus Attributed to Raymond Lull* (London, 1989); Pereira, *L'oro dei filosofi: saggio sulle idee di un alchimista del Trecento* (Spoleto, 1992).

⁷ On Ripley, see Jennifer M. Rampling, “Establishing the Canon: George Ripley and His Alchemical Sources,” *Ambix* 55 (2008): 189–208; Rampling, “The Catalogue of the Ripley Corpus: Alchemical Writings Attributed to George Ripley (d. ca. 1490),” *Ambix* 57 (2010): 125–201 (hereafter *CRC*); Rampling, *The Making of English Alchemy* (Chicago, forthcoming).

⁸ On the authenticity of the *Medulla*, see Jennifer M. Rampling, “The Alchemy of George Ripley, 1470–1700” (PhD diss., Univ. of Cambridge, 2009), chap. 1; *CRC* (cit. n. 7), 130–1. The earliest extant witness of the original Latin text is Cambridge, Trinity College Library, MS R.14.58, Pt. 3 (hereafter *Medulla*), 1r–6r.

George Neville, the Archbishop of York.⁹ In his preface, Ripley promises to strip away the layers of obfuscation from his medieval authorities, revealing the practical kernel—or marrow—of their art. This he proposes to do in three chapters, treating the “mineral,” “vegetable,” and “animal” stones, respectively: three elixirs, each with a distinct mode of manufacture and a different application.¹⁰

Of these, the vegetable stone is a medicinal elixir that, unlike the transmutational mineral stone, does not contain toxic corrosives. Instead, this stone was thought to employ a solvent derived from wine: either distilled alcohol or tartar. One of Ripley’s authorities, the pseudo-Lullian *Liber de secretis naturae, seu de quinta essentia*, prescribes highly rectified spirit of wine as a “resolutive menstruum” for dissolving metallic bodies.¹¹ This, however, Ripley knows to be infeasible:

Some assert that this fire is a water drawn from wine, according to the common way, and should be rectified, being distilled as many times as possible . . . yet, when water of this kind (which fools call the pure spirit), even if rectified a hundred times, is put upon the calx of whatever body, however well prepared, nevertheless we see it will be found weak and entirely insufficient for the act of dissolving our body.¹²

To complicate matters further, in another work, the *Repertorium*, Raymond stated that the solvent should be drawn from a metallic body. Ripley fastens onto the contradiction:

If, as Raymond says, the resolutive menstruum springs from wine or the tartar thereof, how is what the same philosopher says to be understood: “Our water is a metalline water, because it is produced from a metalline kind”?¹³

By drawing attention to these problems in his source text, Ripley demonstrates his own knowledge of both textual authorities and material substances. His aim is to show that he understands Raymond’s true meaning: the resolutive menstruum is not spirit of wine (which must therefore be a cover name) but a solvent possessed of both vegetable and mineral qualities, drawn from an imperfect metallic body using a solvent that is nevertheless derived from wine. In light of this exegetical juggling, Ripley proposes an alternative recipe for the vegetable stone:

Take the sharpest humidity of grapes, distilled, and in it dissolve the body, well calcined into red (which by masters is called *sericon*) into crystalline, clear and heavy water. Of which water let a gum be made, which tastes like alum, which by Raymond is called *vitriolum azoqueus*.¹⁴

⁹ Although Ripley does not name his ecclesiastical patron, Neville (who died in 1476) is a likely candidate, as archbishop of Ripley’s diocese of York.

¹⁰ The trope of the animal, vegetable and mineral stone appears in the pseudo-Aristotelian *Secretum secretorum*, and recurs in the pseudo-Lullian *Epistola accurrationis*, one of the *Medulla*’s main sources. See Rampling, *Making of English Alchemy* (cit. n. 7), passim.

¹¹ *Ibid.*, chap. 2. On *De quinta essentia*, see also Michela Pereira, “‘Vegetare seu transmutare’: The Vegetable Soul and Pseudo-Lullian Alchemy, in *Arbor Scientiae: der Baum des Wissens von Ramon Lull: Akten des Internationalen Kongresses aus Anlaß des 40-jährigen Jubiläums des Raimundus-Lullus-Instituts der Universität Freiburg i. Br.*, ed. Fernando Domínguez Reboiras, Pere Villalba Varneda, and Peter Walter (Turnhout, 2002), 93–119.

¹² *Medulla* (cit. n. 8), 5r. For the original Latin text of this and subsequent passages, see Rampling, *Making of English Alchemy* (cit. n. 7), chap. 2. All translations are mine unless otherwise stated.

¹³ *Medulla* (cit. n. 8), 5r.

¹⁴ *Ibid.*, 5v.

In Ripley's process, the "sharpest humidity of grapes" apparently refers to distilled wine vinegar, in which the metallic body is gradually dissolved. Yet what of sericon?

Like many *Decknamen*, the term has authoritative provenance. Sericon is one of the substances mentioned by the philosopher "Mundus" in the *Turba philosophorum*, an early thirteenth-century Latin translation of an Arabic text probably composed around 900 CE.¹⁵ While its early etymology is obscure, the term seems to have originally signified a red pigment.¹⁶ One contender is minium, or red lead: an orange-red powder made by calcining litharge (modern lead oxide). An inexpensive substitute for the costlier vermilion, minium-based pigments were familiar to every medieval scriptorium, supplying manuscripts with their rubricated capitals.

The identification of sericon with red lead is supported by its various appearances in English alchemical recipes of the late fifteenth century, where it is usually related to "adrop" (another *Deckname* for lead). Sometimes the terms are used interchangeably,¹⁷ but more often sericon is described as a product of adrop—"Sericon, which is otherwise called burned Adrop."¹⁸ In alchemical writing the term was used to denote minium, or calcined lead, a definition still in use in 1612, in Martin Ruland's famous *Lexicon alchemiae*.¹⁹

In choosing sericon as his starting matter, Ripley may have been influenced by various factors. Just as his study of Lullian texts highlighted logical contradictions, so his personal knowledge of chemical procedures ruled out a literal reading of Raymond's implausible "spirit of wine." On the other hand, both logic and experience could be satisfied if Raymond's resolute menstruum were explained in terms of lead and vinegar. Lead salts dissolved in strong vinegar were well known to produce "sugar of lead," a sweet-tasting, crystalline, and toxic compound that, barring impurities, would correspond to modern lead acetate.

Ripley's recipe provides a reasonably detailed overview of this process: once dissolved in the distilled vinegar, sericon forms a gum (lead acetate), which produces a white vapor (acetone) when distilled. Upon condensation, this liquid is found to have several interesting properties, including a sharp taste and a bad smell that earn it the name of *menstruum foetens* ("stinking menstruum"). It is also extremely volatile, and if the practitioner wishes to proceed to the elixir, he must do so within an hour of its distillation. When added to its calx, the menstruum boils without the addition

¹⁵ Julius Ruska, ed., *Turba Philosophorum: Ein Beitrag zur Geschichte der Alchemie* (Berlin, 1931), 169: "Oportet igitur, ut plumbum in nigredinem convertatur; tunc decem praedicta in auri fermento apparebunt cum sericon, quod est compositio, quod et decem nuncupatur nominibus." Ruska gives the Arabic name as *sīrīqūn*, 30.

¹⁶ Isidore of Seville describes *Syricum* as a red pigment used to add the capital letters to books, which he explicitly differentiates from *sericum*, silk: W. M. Lindsay, ed., *Isidori Hispalensis Episcopi Etymologiarum Sive Originum Libri XX*, Book XIX (Oxford, 1911). Alchemical texts in Byzantine Greek also use σπρικόν to denote a red pigment, although this usage may simply refer back to the Latin *Syricum*. See also Dietlinde Goltz, *Studien zur Geschichte der Mineralnamen in Pharmazie, Chemie und Medizin von den Anfängen bis Paracelsus* (Wiesbaden, 1972), 190–1.

¹⁷ E.g., "Take Adrop otherwise callid sericon." British Library, MS Sloane 3579 (ca. 1475–1500), 6r.

¹⁸ "Recipe Sericon quod aliter vocatur Adrop combustum." Bodleian Library, MS Ashmole 1450, Pt. VII (ca. 1560–1600), 82.

¹⁹ "Sericon, id est, minium." Martin Ruland Jr., *Lexicon Alchemiae sive Dictionarium Alchemisticum, Cum obscuriorum Verborum, & Rerum. Hermeticarum, tum Theophrast-Paracelsicarum Phrasium* . . . (Frankfurt am Main, 1612), 431. Ruland defines minium as either "mercurius Saturni praecipitatus vel crocus minii" (mercury of Saturn precipitate, or saffron of minium) or "gemeine rote Farb/vnd gebrandt Bley" (ordinary red pigment and burnt lead), 336.

of any extraneous heat. For this reason, only enough liquid should be added to just cover the calx.²⁰

We might wonder to what extent accounts like this, deeply embedded within an existing textual tradition, reflect their authors' own experimentation.²¹ Throughout the *Medulla*, Ripley provides numerous accounts of processes and observations, suggesting that his careful study of pseudo-Lullian doctrines has indeed been put to the test. His dismissal of rectified spirit of wine as "entirely insufficient for the act of dissolving our body" smacks of personal experience, as do his warnings concerning the volatility of his own vegetable menstruum.

Availability of materials offered another constraint. The Englishman reports that he could not use another menstruum recommended by Raymond, a tartar "blacker than the tartar of the Catalonian grape," because "this thing is rare in these parts."²² However, another authority, Guido de Montanor, "has discovered another unctuous humidity, sprung from wine," which provides an adequate substitute. Although Ripley discusses his options primarily in terms of authority rather than logistics, his adoption of a lead- rather than a tartar-based process may reflect local knowledge (Yorkshire was a lead-mining area).²³

Yet Ripley's *practicae* are just as likely as his *theoricae* to be shaped by written accounts. For instance, in likening his gum to Raymond's *vitriolum azoqueus* and his condensed vapor to *menstruum foetens*, Ripley links his observations to substances reported in another pseudo-Lullian authority, the *Testamentum*²⁴—thereby generating a Lullian endorsement for a process that he admits has not been taken directly from Raymond. Ripley has also varied the usual recipe for sugar of lead, by employing red lead rather than the more readily available litharge. In altering the chemistry, Ripley may have acted on information gleaned from his own experience or that of others. However, his usage may also reflect the authority of the *Turba philosophorum*, a text he mentions earlier in the *Medulla*. Ripley's description of the body, "which by masters is called sericon," sounds like a reference to the gathered adepts of the *Turba*'s "crowd of philosophers," who endorsed a substance of that name: a substance that by Ripley's time seems to have become identified with minium. The alchemical significance of the color red—associated with both blood and the culminating *rubedo* stage of the philosophers' stone—may also have counted in its favor.²⁵

We might regard Ripley's adaptation as a kind of "practical exegesis," in which

²⁰ *Medulla* (cit. n. 8), 5v.

²¹ For instance, secrets literature is rife with meticulously described yet suspect procedures, some of ancient provenance; see Pamela H. Smith, "What Is a Secret? Secrets and Craft Knowledge in Early Modern Europe," in *Secrets and Knowledge in Medicine and Science, 1500–1800*, ed. Elaine Leong and Alisha Rankin (Burlington, Vt., 2011), 47–66.

²² *Medulla* (cit. n. 8), 5r. This substance, called *nigrus nigrius nigro*, is mentioned in the pseudo-Lullian *Epistola accurtationis*.

²³ Bridlington Priory owned a mine from which lead was exported to the continent; Colin George Flynn, "The Decline and End of the Lead Mining Industry in the Northern Pennines, 1865–1914: A Socio-Economic Comparison between Wensleydale, Swaledale and Teesdale" (PhD diss., Durham Univ., 1999).

²⁴ Michela Pereira and Barbara Spaggiari, eds., *Il Testamentum alchemico attribuito a Raimondo Lullo: Edizione del testo latino e catalano dal manoscritto Oxford, Corpus Christi College*, 255 (Florence, 1999), 310, 318.

²⁵ On red's alchemical significance, see Leah DeVun, *Prophecy, Alchemy, and the End of Time* (New York, 2009), 116–27; Pamela H. Smith, "Vermilion, Mercury, Blood, and Lizards: Matter and Meaning in Metalworking," in *Materials and Expertise in Early Modern Europe: Between Market and Laboratory*, ed. Ursula Klein and Emma C. Spary (Chicago, 2010), 29–49, on 41–5.

specific processes and products (Raymond's resolute menstruum and vegetable stone) have been reinterpreted to accommodate such considerations as availability of materials and compatibility with the practitioner's own empirical observations. Just as Ripley manipulated conflicting textual sources to obtain consensus, so he modified recipes to fit practical findings and practices to fit established tropes. Thus, while Ripley's practices and theoretical arguments have their origins in recognizable fourteenth- and fifteenth-century exemplars, his *Medulla* may be reduced neither to a compilation of earlier treatises nor to a straightforward recipe collection. In its consistent elaboration of pseudo-Lullian doctrines, supported by source criticism and applied to material pursuits, it offers both a commentary on a preexisting tradition and a serious practical engagement with the challenges posed by a confusing and—unknown to Ripley—pseudepigraphic corpus. Between the cracks of Ripley's familiar sources, we catch glimpses of flexibility and innovation in the staging of his own empirical work: a source of knowledge that would feed back into his writings and those of his readers.

THE FIXING OF SERICON

The sixteenth century saw an increase in the number of works attributed both to Raymond and to his increasingly well-known expositor, Ripley, as their respective corpora expanded to include new glosses and commentaries. The "sericonian" method, based on the dissolution of lead salts in wine- and tartar-based solvents, became a staple of English alchemical treatises, recipes, and patronage suits.

As an approach to alchemical practice, this method offered several benefits to practitioners and their patrons. The ingredients were both cheap and readily available. Besides providing manuscript illuminators with an alternative to vermilion, minium offered alchemists an inexpensive prime matter—an "imperfect" metallic body rather than the precious metals praised in pseudo-Lullian treatises. For instance, the *Pupilla alchimiae*, a macaronic treatise probably composed in the last quarter of the fifteenth century, describes a recognizably sericonian process using vinegar and "red lede," which is readily obtainable "at the apotecaries redy preparat and of litell prise."²⁶

It was also adaptable. While the substitution of vegetable solvents like vinegar for mineral acids raised the possibility of medicinal applications, sericon could also be used for transmutation. Ripley describes how his vegetable stone could be combined with the "mineral stone" (made using vitriol and saltpeter, the main ingredients of *aqua fortis*) to produce a compound water, or *aqua composita*.²⁷ The inclusion of mineral corrosives restricted the use of the compound water, which was therefore intended only for the healing of metals, rather than people.

These benefits were not, however, unique to lead—leaving open the door to a range of alternative readings and practices. For this reason, practitioners seeking to replicate Ripley's processes sometimes struggled with the precise nature of sericon. In a collection of recipes related to the vegetable stone, the Elizabethan merchant Clement Draper glossed his own transcription of the *Medulla* with alternative readings of

²⁶ British Library, MS Sloane 3747, 48v. When transcribing texts, I have retained original spelling and capitalization, using italics to denote the expansion of contractions or abbreviations. Information necessary to convey the sense of a word or passage (including the translation of symbols) is included within square brackets.

²⁷ *Medulla* (cit. n. 8), 3r.

sericon: ceruse of lead, or else a “vittrioll made of most sharpe moysture of grapes to be verdigreace for yt is made of vineger and tarter.”²⁸ While Draper’s first suggestion takes account of sericon’s long-standing association with lead, his second proposes verdigris, a copper acetate that—like red lead—was widely used as a pigment. These readings may offer us a glimpse of Draper’s exchanges with practitioners within London’s King’s Bench prison, where Draper spent his confinement compiling extensive alchemical notebooks and testing their contents.²⁹

Another Elizabethan alchemist, Thomas Potter, compiled a compendium around 1579–80: now British Library MSS Sloane 3580A and B. Potter also seems to have been in contact with other alchemical adherents, to judge by his success in accessing and collating copies of alchemical treatises, including Ripley’s earlier poem, the *Compound of Alchemy* (1471).³⁰ Ripley there identified “Venus” (the standard *Deck-name* for copper) with the “green lion,” as Potter later observed in his own annotations to the *Compound*: “The Lyon greene, is mercury of venus, which muste be calcyned with [gold]. & [silver].”³¹ This identification may have influenced Potter’s speculations on the nature of sericon in other Ripleian works.³² For instance, he added a marginal note to the *Whole Work of the Composition of the Stone Philosophical*: one of the most overtly practical texts attributed to Ripley, which opens by directing the adept to “First take 30 pound weight of sericon.”³³ Potter here glossed sericon as “a minium powder of metal,” while leaving the choice of metal open: “copper. &c.”³⁴

If Potter’s diffident labeling suggests the privileging of text rather than experience, no such hesitation is apparent in a treatise of the French diplomat and translator, Blaise de Vigenère (1523–96). De Vigenère, inventor of a famous cipher, apparently deciphered Ripley’s sericon without difficulty—although he disagreed with it on practical grounds, opting for litharge instead:

Some, as Riply, and others, have taken the *minium* of lead, but it is . . . of an uneasie resolution, as also ceruse & calcined lead. For my part I have found litharge, which is nothing else but lead . . . poure thereon distilled boiling vinegar, stirring it strongly with a staffe, and sodainly the vinegar will charge itself, with the dissolution of litharge.³⁵

However, by far the most frequent rereading of the alchemists’ red lead was “antimony,” often used to denote stibnite (natural sulfide of antimony) rather than metallic

²⁸ British Library, MS Sloane 1423, 29r.

²⁹ On Draper’s alchemy and note-taking practices, see Deborah E. Harkness, *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven, Conn., 2007), chap. 5.

³⁰ On Potter’s editing strategies, see George R. Keiser, “Preserving the Heritage: Middle English Verse Treatises in Early Modern Manuscripts,” in Stanton J. Linden, ed., *Mystical Metal of Gold: Essays on Alchemy and Renaissance Culture* (New York, 2007), 189–214; Jennifer M. Rampling, “Depicting the Medieval Alchemical Cosmos: George Ripley’s Wheel of Inferior Astronomy,” *Early Sci. Med.* 18 (2013): 45–86, on 75–6.

³¹ British Library, MS Sloane 3580A, 142r; cf. a similar note on 144v. On Ripley’s use of copper, see Rampling, “Establishing the Canon” (cit. n. 7), 205–6.

³² Potter highlighted Ripley’s use of sericon in the *Medulla*, although without recording an interpretation: Sloane 3580A (cit. n. 31), 143v.

³³ On the *Whole Work*, see CRC (cit. n. 7), 197.

³⁴ Sloane 3580A (cit. n. 31), 214v.

³⁵ Blaise de Vigenère, *A Discourse of Fire and Salt, Discovering many secret Mysteries, as well Philosophicall, as Theologicall* (London, 1649), 70; English translation of de Vigenère’s posthumously printed *Traicté du Feu et du Sel* (Paris, 1618).

antimony itself. Indeed, sixteenth-century practitioners were generally more interested in antimony than their medieval forebears and hence alert to possible references in their source texts.³⁶ The recommendation of antimonial compounds as medicinal purgatives in Paracelsian treatises, and their increasing use by medical practitioners throughout the sixteenth century, culminating in the notorious “antimony wars,” provides one likely context for the increasing substitution of antimony in sericonian recipes.³⁷ Another is the value of antimony in metallurgy, as a means of purging gold or silver of impurities. From the late sixteenth century, the influential writings of Alexander von Suchten (1520–75) and the fictitious “Basil Valentine”³⁸ also helped secure antimony’s place as a key alchemical ingredient.

The reinterpretation of red lead as antimony is assisted by similarities between both sets of procedures. Medicinal preparations of antimony often employed the vegetable solvents of wine, vinegar, and tartar, creating a clear, practical bridge between antimonial and lead-based practice.³⁹ Writing in 1350–1, John of Rupescissa had described the preparation of a “quintessence of antimony” using spirit of wine, which he explicitly differentiated from sugar of lead—maintaining that the antimonial product was sweeter and better than ceruse dissolved in vinegar.⁴⁰ This procedural correspondence may have been deepened further by the perceived relationship between various “leaden” metals that were not always sharply distinguished in early chemistry, including antimony, marchasite, and lead: a correspondence noted by both Rupescissa and his later reader, Paracelsus.⁴¹ A “red antimony” also existed, in the form of kermesite—making “red lead” a plausible cover name for the brownish-red antimonial ore. Whatever the deciding factor, the substitution of antimony for red lead helped shape the reception of two other widely circulated works that later came to be associated with Ripley: the *Pupilla alchymae* and the *Whole Work*.⁴²

Like the *Medulla*, the *Pupilla* describes two solvents, made using different ingredients: a “red lion” for medicine and transmutation and a “green lion” for transmutation only. In the earliest known copy, MS Sloane 3747, the red lion is explicitly identified

³⁶ The major exception is the *Liber de consideratione quintae essentiae* of John of Rupescissa (ca. 1351–2), which describes the distillation of antimony with quintessence of wine: *Ioannis de Rupescissa qui vixit ante CCCXX annos, de consideratione Quintae Essentiae rerum omnium, opus sanè egregium* (Basel, 1597), 88.

³⁷ On the “antimony wars” (1566–1666), see Didier Kahn, *Alchimie et Paracelsisme en France à la fin de la Renaissance (1567–1625)* (Geneva, 2007). Although mentioned in fifteenth-century English texts, including Ripley’s *Compound of Alchemy* (where Ripley rejects it), antimony often appears in the context of recipes derived from Rupescissa. Thus Sloane 3747 (cit. n. 26), 94r, describes a “quintessence of antimony” excerpted from John’s *De consideratione*.

³⁸ For instance, Alexander von Suchten, *Liber unus de Secretis Antimonii, das ist von der grossen Heimlichkeit des Antimonii* (Strasbourg, 1570); *Antimonii Mysteria Gemina . . .* (Leipzig, 1604); Basil Valentine, *Triumph-Wagen Antimonii . . . An Tag geben, durch Johann Thölden . . .* (Leipzig, 1604).

³⁹ The archetypal antimonial product, emetic tartar (antimony potassium tartrate), is made using tartaric acid. On antimonial preparations, see R. Ian McCallum, *Antimony in Medical History* (Durham, 1999), 99–102.

⁴⁰ *Ioannis de Rupescissa* (cit. n. 36), 90.

⁴¹ For instance, “Gold and the Marcasite, Antimony and Lead, the which in their framing and Constellation, may be compared to each other mutually, but are nevertheless Separated in Virtue.” English translation of Paracelsus’s *Archidoxa . . . Zehen Bücher* (Basel, 1570), in *Paracelsus, his Archidoxis comprised in ten books: disclosing the genuine way of making quintessences, arcanums, magisteries, elixirs, &c . . .*, trans. J. H. (London, 1660), Book VI, 82–3. The precise identity of Rupescissa’s antimony, “a leaden marchasite” (*Marchasita plumbea*), is unclear. However, he clearly differentiates it from lead compounds: *Ioannis de Rupescissa* (cit. n. 36), 90.

⁴² I question Ripley’s authorship of the *Pupilla* in *CRC* (cit. n. 7), 130 and 187, although this cannot be definitively excluded.

with red lead, and the green lion with Roman vitriol.⁴³ The writer praises red lead as the subtlest of lead compounds, being easily soluble in a “vegetable mercury,” or “water”:

Take redde lede which is *verey* spongeouse rather then eny other lede which is neither so spongeouse ne so sotill for in it anon the *water* will entre and make his dissolucion as nedefull is to be.⁴⁴

This straightforward identification is taken from the earliest witness of the *Pupilla*: a fifteenth-century copy lacking the *practica*.⁴⁵ Other copies date from the mid-sixteenth century onward, by which time the “red lion” seems to have acquired a gloss immediately after the reference to red lead: “[id est] antimonye prepared.”⁴⁶ This note, an apparent interpolation by an unknown reader, was subsequently preserved in other copies of the *Pupilla*, including the only printed edition of the work (in which the “green lion,” vitriol, has furthermore been glossed as “sublimed mercury”).⁴⁷ By transforming “red lead” into the *Deckname* for an antimonial compound, this reading essentially altered the underlying alchemy of the treatise. Indeed, were it not for the solitary witness of MS Sloane 3747, we would have no clue that the red lion ever signified anything other than antimony.

An identical amendment was made to the pseudo-Ripleian *Whole Work*, in which the prescription of “30 pounds of sericon” seems to have originally referred to minium.⁴⁸ However, some readers clearly viewed it as antimony, including the mathematician John Dee, who glossed his own early seventeenth-century transcription as “red leade, [antimony].”⁴⁹ By 1683, the antimonial reading was sufficiently entrenched to be silently incorporated into the version published by the London bookseller William Cooper: “30 pound weight of Sericon or Antimony.”⁵⁰

In these examples, substantive changes in interpretation and practice—specifically, the substitution of an antimonial practice for a lead-based one—have been inferred from relatively minor alterations to manuscript copies. Yet even minor changes to a recipe could have serious practical implications for the outcome of a chemical operation.⁵¹ Over several centuries, textual accounts became uncoupled from their

⁴³ “The redde lyon and the grene lyon that is red lede and vitriol romayn.” Sloane 3747 (cit. n. 26), 49r.

⁴⁴ *Ibid.*, 49v.

⁴⁵ *Ibid.*, 47r–50v.

⁴⁶ Bodleian Library, MS Ashmole 1480, pt. 1 (sixteenth century), 91v, and other manuscripts (*CRC* [cit. n. 7], 188–90).

⁴⁷ “Sunt enim plumbum rubeum, sive minera plumbi, h. e. Antimonium minerale praeparatum; & Vitriolum Romanum, id est [mercur]ius sublimatus.” George Ripley, *Opera omnia chemica*, ed. Ludwig Combach (Kassel, 1649), 301.

⁴⁸ This reading is accepted in several early copies, including that of Thomas Potter (see above) and British Library, MS Sloane 1095 (1550–1600), 75r, where sericon is glossed: “Plumbum cum comburitur coloris rubei efficitur quod a magistris Sericon appellatur” (Lead once it is burned is made of a red color, which by masters is called sericon).

⁴⁹ Bodleian Library, MS Ashmole 1486, Pt. 5, 1. On Dee and sericon, see Jennifer M. Rampling, “John Dee and the Alchemists: Practising and Promoting English Alchemy in the Holy Roman Empire,” *Stud. Hist. Philos. Sci.* 43 (2012): 498–508.

⁵⁰ *The Bosome-Book of Sir George Ripley* (London, 1683), included in *Collectanea chymica a Collection of Ten Several Treatises in Chymistry, Concerning The Liquor Alkahest, the Mercury of Philosophers, and other Curiosities worthy the Perusal* (London, 1684), 101. See also the annotations to the *Whole Work* in British Library MS Sloane 319, 4r–v; and the complete reframing of the *Whole Work* in antimonialist terms in the *Liber Secretissimus Georgii Riplei*, in MS Sloane 689, 20r–31r.

⁵¹ See Lawrence M. Principe, “‘Chemical Translation’ and the Role of Impurities in Alchemy: Examples from Basil Valentine’s *Triump-Wagen*,” *Ambix* 34 (1987): 21–30.

original traditions and paired with new techniques—transformations that could be unwittingly mediated by practitioners whose intention was simply to clarify or supplement their authority. Thus, although the sericonian paradigm of menstrea and vegetable stones continued to circulate, it faced increasing competition from other sixteenth- and seventeenth-century practices, as sericonian works were adopted and adapted by proponents of different methods.

THE TRANSMUTATION OF PRACTICE

As recent scholarship has emphasized, much of the vigor of early modern alchemy stemmed from its dual identity as *scientia* and *ars*. This identity demanded, besides practical skill, the ability to construe texts.⁵² The resulting negotiation between authority and experience evokes the quid pro quo of physicians seeking to substitute local flora and fauna for ancient (and often unidentifiable) *materia medica*. Yet alchemical readers brought an additional preoccupation to their texts, with the assumption that literal readings alone were insufficient to divine intended meaning. While these deliberately abstruse writings might be susceptible to the techniques of medieval scriptural exegesis or humanist philology,⁵³ practical observation offered another tool by which readings might be assessed and revised. Such revisions are not, however, always explicit and can sometimes be inferred only as their cumulative effects on succeeding literature become apparent.

The transformations wrought by practical exegesis affected not only ingredients and processes but even the ends of alchemy. The implications of these shifts are most striking when we compare treatises that draw upon a common authority yet still advocate different “alchemies”: the medicinal sericonian approach, for instance, versus an antimonial method aimed at transmutation. Ambiguity in a source might produce multiple readings, as in the case of the *Vision*, a short, allegorical poem translated from Latin into English during the 1570s by the gentleman alchemist Samuel Norton, who attributed it to Ripley.⁵⁴

The *Vision* describes the poet’s vision of a red toad, which expires after consuming the “juice of grapes”:

When busie at my booke I was upon a certeine night,
This Vision here exprest appear’d unto my dimmed sight,
A *Toade* full ruddy I saw did drinke the juce of grapes so fast,
Till over charged with the broth, his bowells all to brast.⁵⁵

⁵² See, inter alia, William R. Newman and Lawrence M. Principe, *Alchemy Tried in the Fire: Starkey, Boyle, and the Fate of Helmontian Chymistry* (Chicago, 2002); Bruce T. Moran, *Andreas Libavius and the Transformation of Alchemy: Separating Chemical Cultures with Polemical Fire* (Sagamore Beach, Mass., 2007); Moran, “Eloquence in the Marketplace: Erudition and Pragmatic Humanism in the Restoration of Chymia,” in this volume.

⁵³ See Peter J. Forshaw, “Vitriolic Reactions: Orthodox Responses to the Alchemical Exegesis of Genesis,” in *The Word and the World: Biblical Exegesis and Early Modern Science*, ed. Kevin Killeen and Peter J. Forshaw (Basingstoke, 2007), 111–36.

⁵⁴ On Norton’s role as “discoverer,” translator, and editor of Riplean works, including the *Vision* and *Whole Work*, see *CRC* (cit. n. 7), 132–3. On Norton, see Scott Mandelbrote, “Norton, Samuel (1548–1621),” in *Oxford Dictionary of National Biography* (Oxford, 2004; online ed., 2008), <http://www.oxforddnb.com/view/article/20357> (accessed 23 January 2008).

⁵⁵ “The Vision of Sir George Ripley,” in *Theatrum Chemicum Britannicum*, ed. Elias Ashmole (London, 1652), 374. On the various versions of the poem, see *CRC* (cit. n. 7), 195–6.

The remainder of the poem describes the death agonies and putrefaction of the unfortunate toad. Norton interpreted this allegory in the first chapter of his own *Key of Alchemie*, a work dedicated to Queen Elizabeth I that Norton hoped would elicit both a license to practice and financial investment.⁵⁶ He offers a sericonian reading, in which the juice of grapes is distilled vinegar, which “commeth of the vine, & hath vertue ingressive.” This virtue causes the body of the toad to lose its original form: “Heere Riplies toad drinks so fast, that his Bowells be all burst.”⁵⁷

Key to the poem is the identity of the red toad. Norton explains, “By this toad [Ripley] meaneth red Ledd that is Adrop or Minium or Saturne, or Capricorne or Rupescissus Antimonie.”⁵⁸ This string of *Decknamen* might give us pause for thought, particularly given the inclusion of John of Rupescissa’s antimony—which, as we have seen, did not indicate minium, at least in its original sense. Helpfully, Norton priced up his materials in a shopping list appended to the *Key*. This starts with “Red lead or minium in waight 280” (at four pence the pound), then, “Item for the first solution of the same . . . 280 gallons of distilled vinegar” (at ten pence the gallon).⁵⁹

The interpretative cycle has come full circle: while red lead was elsewhere taken as a cover name for antimony, Norton here reads Rupescissa’s antimony as lead, preserving the authority rather than the substance of the medieval treatise. The reference to “capricorn” (which Norton also equates with minium elsewhere in the *Key*) alludes to another work, by Lucas Rodargirus.⁶⁰ Yet despite these textual appropriations, Norton claims to have extracted a known and replicable chemical process from the *Vision*, as attested by his list of materials and prices, detailed drawings of furnaces, and technical exposition of the obscure instructions of his authorities.

Some seventy-five years after Norton’s *Key*, another “Exposition” of the *Vision* was written by George Starkey (1628–65). Starkey is well known both for his role in tutoring the young Robert Boyle in chemistry and for the success of alchemical works written under his pseudonym.⁶¹ Writing as Eirenaeus Philalethes, Starkey produced a series of commentaries during the early 1650s on those Ripleyan works that had already been printed in English, including the *Vision*.⁶²

Starkey may not have realized as he set out his own line-by-line commentary that the *Vision* was based on Norton’s translation of a Latin original. Reconstructing the

⁵⁶ The *Key* survives only in manuscript: Bodleian Library, MS Ashmole 1421 (transcribed ca. 1611 by Thomas Robson) and Getty Research Institute, MS 18, Vol. 10, Pt. 2 (hereafter Getty). There is no record of whether the Queen ever received Norton’s proposal.

⁵⁷ Getty (cit. n. 56), 32. This passage is omitted in Ashmole 1421 (cit. n. 56).

⁵⁸ Getty (cit. n. 56), 31–2.

⁵⁹ *Ibid.*, 156.

⁶⁰ “Lead also is by Rodagirus [*sic?*] named Capricornus, & being burnt or Calcined they Call that Minium,” Getty (cit. n. 56), 23. The reference is to Rodargirus, “Pisces Zodiaci inferioris vel de Solutione Philosophica,” printed in *Theatrum chemicum, præcipuos selectorum auctorum tractatus de chemiæ et lapidis philosophici antiquitate, veritate, iure, præstantia et operationibus . . .*, comp. Lazarus Zetzner (Strasbourg, 1622), V:723–65.

⁶¹ For Starkey, see Newman, *Gehennical Fire* (cit. n. 4).

⁶² “Sir George Ripley’s Epistle, to King Edward unfolded” was printed (without Starkey’s consent) in *Chymical, medicinal, and chyrurgical addresses: made to Samuel Hartlib, Esquire* (London, 1655), while a commentary on the *Compound’s* “Recapitulation” appeared in *A breviary of alchemy; or a commentary upon Sir George Ripley’s recapitulation: being a paraphrastical epitome of his twelve gates . . .* (London, 1678). The Ripley commentaries, including “The Vision of Sr George Ripley, Canon of Bridlington, Unfolded,” were collected in *Ripley Reviv’d: or An exposition upon Sir George Ripley’s hermetico-poetical works . . .* (London, 1677–8).

authentic text in its proper fifteenth-century context was not, however, Starkey's goal. His exegesis marks an approach that is strikingly different both from that of Norton and from those of authorities like Ripley who advocated the use of red lead for a medicinal vegetable stone.

In Starkey's interpretation, the "ruddy toad" is not lead but gold.⁶³ The "juice of grapes" is a *Deckname* for the "philosophical mercury" already described in his earlier work, the *Introitus apertus ad occlusum Regis palatium* (The Open Entrance into the Closed Palace of the King).⁶⁴ In describing the toad's repast, Starkey here invokes the same processes reiterated elsewhere in his Ripley commentaries.⁶⁵ As William Newman has shown, these describe the reduction of antimony ore with iron to produce the "star regulus" of antimony, which is circulated with quicksilver to create a "philosophical mercury" capable of dissolving gold.⁶⁶

Often throughout the commentaries Starkey constructs his own riddles, disguising his process with obscure language and imagery that may be decoded by those well versed in alchemical literature and practice. In the case of the *Vision*, the riddle comes ready-made: the death of Ripley's toad is recast as the ingress of philosophical mercury into the body of gold.⁶⁷

In providing commentaries on the famous poem, both Norton and Starkey demonstrate their ability to decipher perplexing alchemical authorities and consequently their own fitness to propagate the art. Yet their approaches to authority differ. Based on his close reading of Raymond's *Epistola accurtationis*, Ripley's *Medulla*, and other sericonian authorities, Norton offers Elizabeth I his interpretation of the cover names applied to successive stages of the vegetable stone's manufacture. From lead is made first adrop (minium), then sericon or the green lion (the gum made from minium), menstruum (an oil drawn from the gum), and finally the blood of the green lion (a menstruum made from the oil).⁶⁸ The result is a complex and nuanced reading of the various terms employed in sericonian practice—Norton's only innovation being to recast sericon as the gum (sugar of lead) rather than minium itself. Several decades later, in 1599, Norton would record these steps in a handsome "tabula," printed in 1630: a tree that sprouts, appropriately enough, from the body of the red toad (*Bufo rubea*), which signifies lead (*Saturnus plumbum*; fig. 1).⁶⁹

In contrast, although Starkey frames his own exposition in relation to Ripley's

⁶³ "Vision of Sr George Ripley" (cit. n. 62), 2.

⁶⁴ *Introitus apertus ad occlusum Regis palatium* (Amsterdam, 1667), 4–5.

⁶⁵ "Vision of Sr George Ripley" (cit. n. 62), 7.

⁶⁶ Newman deciphers one such passage from Starkey's account of the first gate of Ripley's *Compound in Gehennical Fire* (cit. n. 4), 115–69, particularly 125–33.

⁶⁷ "Vision of Sr George Ripley" (cit. n. 62), 8.

⁶⁸ "When they meant to hid the materiall of the vegetable stone; they then termed their Lead, Lead of Philosophers; & being Calcined, which they afore termed Minium they againe Called Adrop; & the gumme which to ye vegetable worck proceedeth of that matter; they Call Sericon; The oile which proceedeth of that Gumme Menstrue. Moreover they termed the Gumme, the green Lion of the philosophers; & this Menstrue is Called the bloud of the green Lion." Getty (cit. n. 56), 23.

⁶⁹ Samuel Norton, *Libri tres tabularum arboris philosophicalis*: British Library, MS Sloane 3667, 24r–89v, 11r, 12r, 15r (incomplete; includes "tabulae"); Bodleian Library, MS Ashmole 1478, pt. 6, 42r–96v, dated 20 May 1599 (104v). The York physician Edmund Deane (1572–ca. 1640) later published the *Libri tres* as a series of eight tracts beginning with *Mercurius Redivivus, seu Modus conficendi Lapidem Philosophicum* . . . (Frankfurt am Main, 1630). On visual representations of alchemical toads, see also Joachim Telle, *Buchsignete und Alchemie im XVI. und XVII. Jahrhundert: Studien zur frühneuzeitlichen Sinnbildkunst* (Hürtgenwald, 2004).

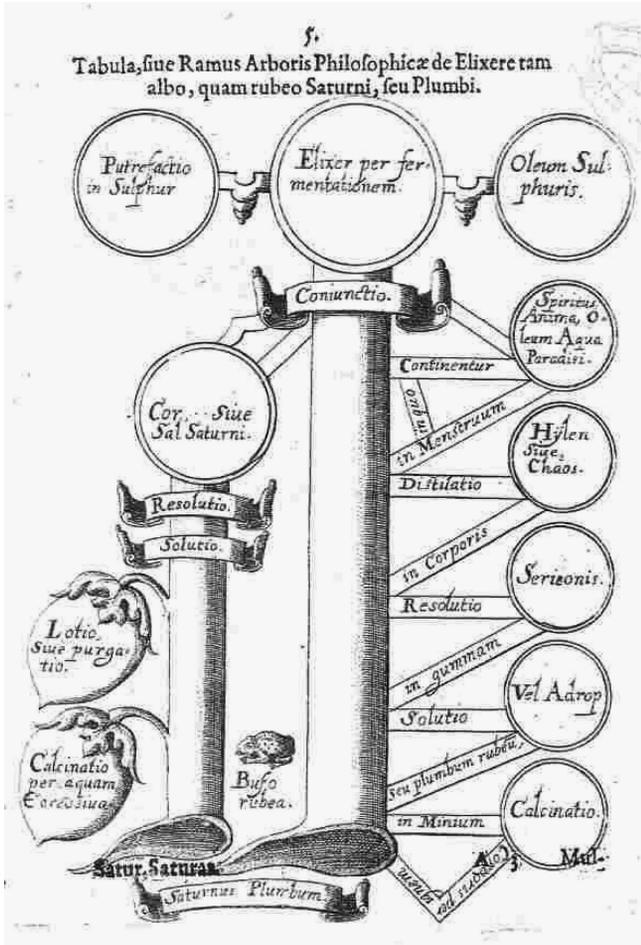


Figure 1. “Tabula” from Samuel Norton, *Saturnus Saturatus dissolutus, et coelo restitutus, seu modus componendi lapidem philosophicum . . .*, ed. Edmund Deane (Frankfurt am Main, 1630), 5.

poem, declaring his intention to “unfold Ripley’s Knots,”⁷⁰ for the actual chemistry he turns to continental sources, including the antimonial practice of Alexander von Suchten. This contrasts with Norton’s goal of a medicinal panacea—the vegetable stone described by his sericonian sources. Yet Suchten’s work is primarily a metallurgical practice, and Starkey reads it as such: meticulously repurposing the *Vision*’s dying toad as a harbinger of transmutation.

Since both the sericonian and antimonial approaches require the dissolution of a metallic body in a solvent, the toad’s fatal thirst provides an apt allegory for either reading. While Norton’s interpretation is doubtless more faithful to the original sense of the poem, pragmatism surely underlies his decision to relate his own practice to that of a revered English authority when seeking royal patronage. Norton and Starkey swathe their methods in the familiar cloak of authority, yet in each case the underlying practice proceeds from a recognizable and replicable starting point, using techniques that could be taught, deciphered, and (at least up to a point) re-created.

⁷⁰ “The Author’s Preface to his Expositions upon Sir George Ripley’s Compound of Alchymy, &c.,” *Ripley Reviv’d* (cit. n. 62), sig. [*5]v.

CONCLUSION: LEAD INTO ANTIMONY?

Starkey's antimonial chemistry departs from the sericonian method beloved of fifteenth-century alchemists. Curiously, this shift occurs without any diminution in the authority of sericon's most famous advocate, Ripley. In the preface to *Ripley Reviv'd*, Eirenaeus Philalethes praises the Canon above all other authorities: "*Ripley to me seems to carry the Garland.*"⁷¹ Later, he compares his own mineral process to those "pitiful Sophisters" who "dote on many Stones, Vegetable, Animal, and Mineral."⁷² Yet the approach rejected by Starkey is integral to Ripley's *Medulla*, and a staple of many sixteenth-century commentaries, including Norton's *Key*. Ripley's authority remains, but the alchemy is no longer his, as the structures and metaphors of his familiar works are appropriated to serve new practices.

Later commentaries also reveal a shift toward chrysopoetic alchemy. The multi-purpose vegetable stone, effective as both medicine and transmuting agent, plays no part in these accounts and is sometimes explicitly excluded, for instance, by the pseudonymous "Hortolanus Junior," whose *Golden Age* was printed by Starkey's publisher, William Cooper.⁷³ This book essentially compiles statements relating to the antimonial alchemy of Eirenaeus Philalethes, while mocking the "superfluity of *Menstruums*" described in erroneous tracts: some made from "philosophical wine" and others from aqua fortis, not to mention "Mineral *Menstruums* Compounded of Vegetable, and Mineral *Menstruums* mixed together."⁷⁴

This attack rejects an entire tradition of alchemical medicine: both the straightforward use of spirit of wine and the manufacture of vegetable-and-mineral compound waters. Alchemists pursuing multiple menstrua are dismissed as "Slipp-slop-Sawse makers." Yet Ripley, who took exactly this approach in the *Medulla*, retains his authority by virtue of his new relationship with Eirenaeus Philalethes; becoming, instead, one of the volume's major authorities.

Throughout these metamorphoses, authoritative instructions offered more than empty vehicles for reinterpretation. Just as Ripley labored to reconcile conflicting aspects of his pseudo-Lullian sources, so the marginalia encountered in later manuscripts speak of attempts by his own readers to derive replicable procedures from his writings. Identifying a work's principal ingredients might lead to reinterpretation: changes that in turn passed back into the textual tradition through the exegete's own writings. Through successive rereadings, often over the course of centuries, the life of authoritative texts was extended through practical exegesis, as practitioners wrestled authority and experience into an approximation of uniformity.

While an awareness of the prehistory of seventeenth-century works is necessary if we are to avoid unwittingly anachronistic readings, these early modern practices

⁷¹ *Ibid.*, sig. *3v.

⁷² "Sir George Ripley's Epistle" (cit. n. 62), 23.

⁷³ *The Golden Age: or, the Reign of Saturn Reviewed, Tending to set forth a True and Natural Way, to prepare and fix common Mercury into Silver and Gold* . . . (London, 1698). On Cooper, see Lauren Kassell, "Secrets Revealed: Alchemical Books in Early-Modern England," *Hist. Sci.* 49 (2011): 61–87.

⁷⁴ *Golden Age* (cit. n. 73), 3–4. One likely target is the Lithuanian chemist and scholar Johann Seger Weidenfeld, who compiled sericonian sources in his *De secretis adeptorum sive de usu spiritus vini Lulliani libri IV. Opus practicum per concordantias philosophorum inter se discrepantium* . . . (London, 1684; rev. ed., Hamburg, 1685), published in English as *Four books of Johannes Segerus Weidenfeld concerning the secrets of the adepts, or, of the use of Lully's spirit of wine* . . . (London, 1685).

of interpolation, substitution, and reconciliation themselves provide telling evidence for the attempts of later readers to construe their texts. As they read, practitioners were alert to clues that might help them integrate each text into a preexisting fabric of knowledge. Indeed, even modern scholars—myself included—may find themselves engaged in a similar kind of exegetical endeavor as they seek to weave together the encoded and temporally distant strands of this fabric.⁷⁵ By re-creating experimental practices in modern laboratory settings, we may also (perhaps unwittingly) replicate our actors' historical practices: grounded in close reading of past texts, yet inevitably bringing contemporary chemical knowledge to bear.⁷⁶

The results of these diachronic interactions stand as a warning to compilers of alchemical lexicons, reminding us that the “materiality” of early modern substances does not always collapse into concrete forms. In the late fifteenth century, sericon suggested red lead, the major ingredient in an influential branch of alchemico-medical practice. Over the next century and a half, it transformed into antimony. Time and exegesis accomplished what no alchemist could achieve alone: the transmutation of one metal into another.

⁷⁵ On re-creating Norton's practice, see Rampling, *Making of English Alchemy* (cit. n. 7), chap. 6. On Starkey's experiments, see Principe, *Secrets of Alchemy* (cit. n. 4), 164–66; and “Chymical Products,” in *The Chymistry of Isaac Newton*, ed. William R. Newman, <http://webapp1.dlib.indiana.edu/newton/reference/chemProd.do> (accessed 25 November 2012).

⁷⁶ That such contemporary knowledge may both inform and confound the original sense of historical texts is suggested by Principe, “Chemical Translation” (cit. n. 51).