Textual Alchemy: The Transformation of Pseudo-Albertus Magnus's *Semita Recta* into the *Mirror of Lights*

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Textual Alchemy: The Transformation of Pseudo-Albertus Magnus's *Semita Recta* into the *Mirror of Lights*[1]

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Abstract: This article explores the strategies of and the reasons behind the reworking of Pseudo-Albertus Magnus's *Semita recta* into the *Mirror of Lights*. I argue that the redactor sought to provide a more comprehensive defense of the legitimacy of alchemy than found in the *Semita recta*. In the process of doing so, he re-shaped the original text so as to present three units that addressed different parts of the alchemical opus: first, theory and justification of alchemy; second, basic information on substances and procedures; and, third, practice. The redactor employed sophisticated textual tools identical to those seen in scholastic texts. These strategies, I argue, are part of the redactor's attempt to bring authority and credibility to his project and to alchemy in general. Certainly, much more attention needs to be paid to these experiments of textual alchemy in order to understand the practice of alchemy in the late medieval period.

One of the most important texts for medieval and early modern alchemists was the *Semita recta* ('the straight path'), usually attributed to the renowned scholar of the natural sciences and Dominican friar Albertus Magnus (ca. 1200–1280). With its focus on the basics of alchemical practice, its logical structure, and its almost complete lack of the metaphorical language characteristic of so many other alchemical treatises, the *Semita recta* became an alchemical "best-seller" from the thirteenth century onward. Although a pseudepigraphic rather than an authentic text by Albertus Magnus, the *Semita recta* survives in more than a hundred manuscripts dating from the thirteenth century to the seventeenth century; it was translated into several vernacular languages starting in the fifteenth century, and it appears in many printed editions, including the

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standard edition of Albertus Magnus's authentic writings.[2] However, despite the *Semita recta*'s

eminently clear and comprehensive coverage, a redactor took great pains in the late fourteenth or

early fifteenth century to enhance its presentation, coherence, and content. The result of the

redactor's efforts was the *Speculum luminum* or *Mirror of Lights*, a treatise with a strict division

of theory/description and practice and with an even fuller treatment of alchemical basics than is

found in the *Semita recta*.

This article discusses the redactional strategies that were employed by the writer of

the *Mirror of Lights*, outlining the *how* and *why* of the redactor's reworking. I will argue that

behind this revision was not only a desire to provide a more easily accessible and more

comprehensive manual of alchemical practice but also a fervent belief that alchemy was a

"scientia vera et ars firma" ('a true science and well-established art').[3] Providing an assiduous

defense of alchemy and presenting the alchemical procedures of the text as logical and

irrefutable, the redactor seems to have intended to make the practicing of alchemy an

unimpeachable pursuit, upgrading it to the level of other *scientiae*. In this attempt at legitimizing

alchemy, the redactor brought sophisticated, scholastic textual techniques, originally associated

with the composition and reworking of texts originating in a university setting, to alchemy, an art

that had no traditional place at universities[4] and was seen as suspicious and hence a less worthy

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[2] For the numerous extant manuscripts of the *Semita recta*, see e.g. Pearl Kibre, "Alchemical Writings Ascribed to Albertus Magnus," *Speculum* 17 (1942): 499–518; "Further Manuscripts Containing Alchemical Tracts Attributed to Albertus Magnus," *Speculum* 34 (1959): 238–247. The *Semita recta* is included in the Borgnet edition of Albertus's works: Auguste and Emile Borgnet, *B. Alberti Magni, Ratisbonensis Episcopi, Ordinis Praedicatorum, Opera omnia* (Paris, 1898), vol. 37. The edition currently being prepared in Cologne at the Albertus Magnus Institute will contain a volume on "Opera dubia et spuria," which will presumably contain an edition of the *Semita recta*. According to the Institute's homepage, work on this volume has not yet been begun. See http://www.albertus-magnus-institut.de/edit1.htm.

[3] *Mirror of Lights*, Trinity College, Cambridge, MS 0. 2. 33, p. 8.

[4] Although alchemy was not taught directly at universities, interest in alchemy certainly existed in the university world, and the creation of metals appears to have been lectured on and debated at some universities. See e.g. Barbara Obrist, *Constantine of Pisa: The Book of the Secrets of Alchemy. Introduction, Critical Edition, Translation, and Commentary* (Leiden: Brill, 1990), 4–5, 24–28.

pursuit by many medieval scholars and clergy.[5] I will suggest that the employment of these textual techniques constituted a step in the redactor's aim to defend the perceived legitimacy of alchemy and to lend credibility and authority to his alchemical text.

There has been intense scholarly attention to the connections between alchemy and Albertus Magnus. His interest in and skepticism toward alchemy have been well-documented, and scholars such as Pearl Kibre have convincingly demonstrated that Albertus did not write the many alchemical texts attributed to him in the Middle Ages and later.[6] However, there has been little textual research on the numerous manuscripts containing pseudo-Albertan texts. Considering the number of manuscripts and the frequent references in other texts, the *Semita recta* clearly belonged to the canon of alchemical literature. At the same time, judging by the state of the surviving manuscripts, subsequent scribes and alchemical practitioners had no compunction about revising the text, perhaps to fit their own experiences and experiments or perhaps influenced by the reading of other texts.[7] Close attention to the manuscripts can give us a great deal of information on alchemical experimentation, thought, and textual restructuring techniques in alchemical texts. It is the final question that this article especially tries to address, by studying the reworking of the *Semita recta* evident in the *Mirror of Lights*. At the same time, I will show that textual strategies can have repercussions for experimentation and alchemical thinking since restructuring is aimed to pave the way for smoother experimentation and easier

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[5] Although Albertus recognized some theoretical validity in alchemy (by contemporaneous standards), he himself was critical of many aspects of it. He castigated the alchemists' overreliance on earlier authorities and their use of metaphorical language in their writings. He also acknowledges that he has never seen successful alchemical experiments. J. R. Partington, "Albertus Magnus on Alchemy," *Ambix* 1 (1937): 3–20, on 13; Pearl Kibre, "Albertus Magnus on Alchemy," in *Albertus Magnus and the Sciences: Commemorative Essays 1980*, ed. James A. Weisheipl (Toronto: Pontifical Institute of Mediaeval Studies, 1980), 187–202, on 190, 194.

[6] Kibre, "Albertus Magnus," 195.

[7] See e.g. Peter Grund, "'ffor to make Azure as Albert biddes': Medieval English Alchemical Writings in the Pseudo-Albertan Tradition," *Ambix* 53 (2006): 21–42.

understanding. *Textual* alchemy was clearly as much a part of the alchemical tradition as transmutational alchemy.

Before exploring the textual strategies used by the redactor that produced the *Mirror of Lights*, I will give some background information on the *Semita recta* and the *Mirror of Lights*, highlighting their complex manuscript traditions. The description of the redaction will first focus on the overall reworking and will then outline in detail some of the recurring patterns. As I will demonstrate in detail later, the textual state of the *Mirror of Lights* is very complicated. One of the most peculiar features is that it does not survive wholly in any one language. Instead, the text is extant partly in Latin, partly in Middle English of the fifteenth century. The examples that I cite will therefore be both in English and in Latin.

The Semita recta *and the* Mirror of Lights*: Some Preliminaries*

Although the *Semita recta* appears as early as the thirteenth century (perhaps even during Albertus Magnus's own lifetime), it is almost certainly pseudepigraphic. As with many other alchemical texts of the Middle Ages and later, the intention with attributing the text to a well-known scholar or clergyman was presumably to capitalize on his fame (in this case, Albertus's reputation as *the* scientist of the period) and hence bestow authority and credibility on the text. An equally strong and more personal incentive for pseudepigraphy was concealment. Since alchemy was forbidden by secular as well as ecclesiastical law for large parts of the Middle Ages, hiding one's identity removed or at least reduced the danger of imprisonment or excommunication.[8]

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[8] Partington, "Albertus Magnus," 13–17; D. Geoghegan, "A Licence of Henry VI to Practise Alchemy," *Ambix* 6 (1957): 10–17; 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 García-Ballester (Aldershot: Ashgate, 1998), 26–52. Michael McVaugh, *The Rational Surgery of the Middle Ages*, Micrologus Library 15 (Florence: Sismel, Edizione del Galluzzo, 2006), 201.

Albertus's name may certainly have contributed to the *Semita recta*'s staggering popularity in the Middle Ages and later. The some hundred manuscripts are probably only a fraction of the once extant copies.[9] Perhaps not surprisingly, there is so far no exhaustive study of the manuscripts of the *Semita recta* and their affiliations. The number of surviving manuscripts, their geographical dispersal, and the existence of the text in uncatalogued or insufficiently described manuscript codices have probably been strong disincentives for scholars. The lack of a complete charting of these manuscripts poses a methodological problem for a study such as this. In order to establish how the redactor who produced the *Mirror of Lights* reworked the *Semita recta*, it is valuable to be able to get as close as possible to the content and appearance of the original that he used. I have made an in-depth study of six versions of the *Semita recta*: the standard printed edition prepared by Auguste and Emile Borgnet and five manuscript versions, in Corpus Christi College, Oxford, MS 226, British Library MS Sloane 513, British Library MS Harley 3542, Glasgow University Library MS Ferguson 205, and Cambridge University Library Kk. 6. 30.[10] A comparison of just this limited set of copies reveals that, although they share a textual core, there is still striking variation within the corpus of *Semita recta* manuscripts. For a study of the genesis of the *Mirror of Lights*, consulting multiple versions is thus crucial. It is clear that the redactor who produced the *Mirror of Lights* was working from a text in parts very similar to one or two but not all of the versions consulted.[11] For example, most of the copies of the *Semita recta* have no equivalent to a *Mirror of Lights* section that assigns planetary names to the

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[9] Kibre, "Alchemical Writings"; "Further Manuscripts."

[10] Borgnet, *Opera omnia*, 545–573. Corpus Christi College, Oxford, MS 226, fols. 58r–68r (Latin); British Library MS Sloane 513, fols. 168v–178r (Latin); British Library MS Harley 3542, fols. 17r–25v (Latin); Glasgow University Library MS Ferguson 205, fols. 54v–71r (Middle English), as transcribed in Marguerite A. Halversen, *The Consideration of Quintessence*: An Edition of a Middle English Translation of John of Rupescissa's *Liber de consideratione de quintae essentiae* [sic] *omnium rerum* with Introduction, Notes, and Commentary (Unpublished Ph.D. Thesis, Michigan State University, 1998); Cambridge University Library Kk. 6. 30, fols. 12r–30r (Middle English).

[11] It is of course also technically possible that the redactor had two or more copies at hand, conflating several textual versions. However, this is difficult, if not impossible, to prove.

seven metals. There is one exception, however: MS Harley 3542, which does propose a similar

connection.

Bodyes for soþe of metall*us* arn þese. Gold. sylu*er* cop*er*. yr*e*. & tyn. & led þe wyche þe phylesofresse callen by þe names of planet*es*. þe gold þey calle*n* þe su*nn*e. silu*er* þe mone. cop*er*. ven*us*. ir*e*. mars. ty*n*. Iubit*er* & led sat*ur*nes (*Mirror of Lights*, British Library MS Sloane 513, fol. 155r)[12]

[…] Cu*m* sint *etiam* .7. metalla/ Q*uo*dli*bet* metallu*m* educi*tur* a sua pl*aneta* vt {a} Sole educi*tur* Aur*um*. & voca*tur* .Sol.// ¶Arg*ent*u*m* a lu*na* & vo*catur* lu*na* /¶ fferru*m* a marte & vo*catur* Mars /¶ Ar*gent*u*m* vi*uum* a m*er*cur*i*o. & vo*catur* M*er*curius/ […] S*imiliter* stag*nu*m e*ducitu*r a Ioue & s*ic* vo*catur* /¶ Cup*ru*m *vel* .es. a ven*er*e & s*ic* vo*catur* /¶ Plu*m*bu*m* a Sat*ur*no & s*ic* vo*catur* (*Semita recta*, British Library, MS Harley 3542, fol. 18r)
['Since there are seven planets, each metal is extracted by its own planet; for example, gold is extracted by the sun and is called Sol [i.e. the sun]. Silver [is extracted] by the moon and is called Luna [i.e. the moon]. Iron by Mars and is called Mars. Argent vive by Mercury and is called mercury. […] Similarly, tin is extracted by Jupiter and is named accordingly. Copper or copper/bronze by Venus and is named accordingly. Lead by Saturn and is named accordingly'.]

Although the discussions are not identical, they are close enough to suggest that the *Mirror of*

Lights redactor did not invent this discussion; rather, it must have been present in some form or

other in his *Semita recta* original. Another example of dissimilarities in the copies are the

frequent additions that are labeled *Caput additum* in the Borgnet edition. They are not found in

any of the manuscripts that I have examined, and there is no trace of them in the *Mirror of Lights*.

The most likely scenario then is that the redactor's exemplar of the *Semita recta* did not contain

these passages; that is, the redactor probably did not omit them independently. The copies that I

have consulted do not represent the universe of *Semita recta* manuscripts, and no single version is

strikingly or consistently closer than another to what the redactor's orginal must have looked like.

However, *as a group* they do provide a solid basis for comparison. A more large-scale

comparison will have to await more work on the numerous *Semita recta* manuscripts, although,

even after such an investigation, the exact nature of the exemplar may remain unknown since it

may simply not have survived.

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[12] In the transcription of manuscript material, I have aimed to be as faithful as possible to the original manuscripts. I have retained the original spelling, capitalization, and punctuation. Abbreviations have been expanded in italics for easier reading. { } enclose readings that have been added above or below the line by the scribe; [ ] enclose my editorial comments. Translations of the Latin material are my own.

Despite manuscript variations, the *Semita recta* is characterized by focus on practice rather than theory, straightforward organization, and logical progression between topics. The following schematic representation illustrates the major sections and individual discussions of the *Semita recta*.[13]

A. **Introduction** (§1–§3): preface; introduction to the errors of other alchemists; the origin of metals; the validity of alchemy; the eight precepts.
B. **Descriptions of substances and equipment, and recipes** (§4–§29): furnaces; vessels; spirits e.g. mercury and sulphur; salts; atrament; tartar; verdigris etc.
C. **Processes I** (§30–§36): theoretical descriptions of sublimation, calcination, dissolution, etc.
D. **Processes II** (§37–§55): practical application of sublimation, calcination, albification, distillation etc.
E. **Elixirs** (§56–§57): recipes for elixirs and transmutation.

Section A deals with some preliminaries in alchemy including a discussion of previous errors committed by other alchemists, a defense of the validity of alchemy, and a description of the origin of metals. The logical sequence among these discussions is not as straightforward as that of the rest of the *Semita recta*, a feature that the redactor producing the *Mirror of Lights* clearly perceived as a weakness and made a primary target for his reworking, as we shall see later. This introductory material gives way to descriptions of equipment and substances. Accompanying each discussion of substances is usually a recipe instructing the reader how to prepare the substance. Following these basics are theoretical as well as practical sections on the most important procedures to be undertaken in the pursuit of the philosophers' stone or elixir, the substance that was believed to transmute "impure" metals into silver or gold. The grand finale of the *Semita recta* is of course the recipes for the elixir, and the previous sections all build up toward this ultimate goal.

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[13] This figure is based on the paragraph division in the Borgnet edition, although the separation into sections (A–E) is mine. I introduced this figure in Grund, "'ffor to make Azure'." Note, however, that I have revised it slightly, moving paragraphs 4–9 (vessels and furnaces) to Section B.

The discussions and structure in the *Semita recta* obviously did not find favor with the redactor who undertook the not insignificant task of reshaping it into the *Mirror of Lights*, most probably sometime in the fifteenth century, but perhaps earlier, and most probably in England.[14] As will become evident, the redactor's efforts are particularly noticeable in the structure of the discussion, while the content, albeit reshuffled and sometimes put in a new context, usually remains virtually identical. Despite its obvious relationship to the *Semita recta*, the *Mirror of Lights* never acknowledges this connection explicitly. Instead, the redactor self-deprecatingly acknowledges some anonymous "prominent philosophers" as his sources:

Ego nanq*ue* minim*us* om*nium* alkimistaru*m* no*n* ex me [sic] sapi*enti*a ~~sex~~ sed ex gracia dei s*anct*issimi [= unclear word] v*er*am a*r*tem alkimie et i*n*effabile*m* co*m*pilam et de melioribu*s* en*im* op*er*ibu*s* expe*r*tis et p*r*obatis a p*r*incipuis ph*ilosoph*is opusculu*m* hec colligi [sic]. (*Mirror of Lights*, Corpus Christi College, Oxford, MS 175, fol. 9r)[15] ['So I, the most insignificant of all alchemists, will bring together the true and ineffable art of alchemy not through my wisdom but through the grace of the most holy God, and I have collected this little work from better works proven and tested by prominent philosophers'.]

The acknowledgment of multiple sources is slightly peculiar. As far as I have been able to ascertain, the *Mirror of Lights* is primarily based on the *Semita recta*. Most of the material that does not seem to derive directly from the *Semita recta* appears to represent elaborations that can easily be deduced or worked out from the *Semita recta*'s discussions. The passages in the *Mirror of Lights* that exhibit no affiliations to passages in the *Semita recta* are so few that the redactor's

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[14] It is uncertain exactly when the original redaction was made. The surviving copies all seem to date from the 15th century or later. A sixteenth-century copy, Bodleian Library MS Ashmole 1423, (Part V) p. 55, contains a note pointing to 1474: "Hear endethe ye Abridgemente of y^t noble worke cawllede {called} Speculum Luminum y^t was wrytte*n* as sayethe myne Auctor in ye yeare 1474." Since several copies appear to be older, this date does not seem reliable. A full paleographic and codicological investigation of the manuscripts of the *Mirror of Lights* might reveal more clues, but such an investigation remains to be done. Similarly, the place of origin is not certain, but all of the manuscripts that I have identified appear to have some connection to England. A lone French copy in Wellcome Institute, London, MS 519, represents a later (sixteenth-century), revised version of the *Mirror of Lights*. It does not seem to indicate the existence of an earlier French tradition. See S. A. J. Moorat, *Catalogue of Western Manuscripts on Medicine and Science in the Wellcome Historical Medical Library. Part I. Mss. Written Before 1650 A.D.* (London: Wellcome Historical Medical Library, Wellcome Institute of the History of Medicine, 1962), 364; Grund, "'ffor to make Azure'," 34–35.

[15] This passage is not found in the only other manuscript that contains Part 1 of the *Mirror of Lights*: Trinity College, Cambridge, MS O. 2. 33. See below for a discussion of the parts of the *Mirror of Lights*.

claim of multiple sources appears to be an exaggeration or perhaps simply an alchemical trope.[16]

Indeed, the redactor's admission even comes across as slightly insincere, when we consider that

in the single most drastic omission of *Semita recta* material, the redactor leaves out the preface of

the *Semita recta* and replaces it with his own introduction explaining the rationale of the name

Mirror of Lights (or *Speculum luminum*). Although previous authorities are recognized (though

notably not by name), the redactor clearly appropriates textual material and presents it as a new

text, his text.

At the same time, although no overt acknowledgment of a textual debt to the *Semita recta*

occurs, a few references to Albertus Magnus do appear. Two of them are of a general nature: One

recognizes Albertus's status as an alchemical authority, and another is a misattribution of a quote

to him.[17] The third is of more interest. The *Mirror of Lights* introduces a recipe on making azure

with

ffor to make Azur*e* as Albert biddes Allbeit that the makynge of Azure longe nat to þis craft of Alkamye he biddis make it to qwyte þ*er*with þyne expensez (*Mirror of Lights*, Trinity College, Cambridge, MS R. 14. 37, fol. 129v).

The phrase "as Albert biddes" is a direct reference to the *Semita recta* where this recipe

appears.[18] Why this particular section triggered an attribution when none of the others did is

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[16] In the preface, the *Semita recta* itself recognizes some sources, which may have been a cue for the *Mirror of Lights*: "libr*um* e*nim* istu*m* sc*ri*psi & defloraui de lib*ris* o*mn*i*um* ph*ilosoph*or*um* q*ui* era*nt* i*n*uentores hui*us* art*is*" [followed by a list of alchemical authorities; the list varies in the manuscripts] 'I have written and made choice selections for this book from the books of all the philosophers that are originators of this art"; Corpus Christi College, Oxford, MS 226, fol. 58v

[17] "Pro p*rimo* e*st* sciendu*m* q*uod* om*nes* alkimie t*ra*ctatores .S. plato. Aristo*teles*. auicena/ hermes durim*us* dansin*us* Rasinus gebar Bellin*us* et albe*rtus* sup*er* vno sensu co*n*cordite*r* q*u*asda*m* co*n*clusio*n*es tamq*uam* p*r*incipia posueru*nt* […]" 'First of all, it is important to know that all writers on alchemy, that is, Plato, Aristotle, Avicen, Hermes, Durimus[?], Dansinus[?], Rases, Geber, Bellinus, and Albertus are in agreement and put forward certain conclusions as a kind of principles' (*Mirror of Lights*, Corpus Christi College, Oxford, MS 175, fol. 9v). "vnde dicit albertus quod aliquod corpus metallicu*m* coruptu*m* est calcinatu*m* […]" 'Therefore, Albertus says that a corrupt metallic body is calcined…' (*Mirror of Lights*, Trinity College, Cambridge, MS O. 2. 33, p. 6). This same quote is found in the *Semita recta*, but there it is attributed to Aristotle; Borgnet, *Opera omnia*, 548.

[18] Borgnet, *Opera omnia*, 557: "Etsi *azurium* non sit necessarium in arte nostra, tamen de eo ponam doctrinam."

unclear. Perhaps the redactor wanted to cite an authority for a recipe that was not seen as integral but only of an ancillary nature to the alchemical procedures that are described in the text. In this way, the redactor could "excuse" the inclusion of a potentially irrelevant recipe by pointing to Albertus's endorsement. Regardless of the exact reasons behind its inclusion, what it does indicate is that the redactor knew with whose text he was tampering.

Perhaps not surprisingly, once the redactor had revised the *Semita recta* into the *Mirror of Lights*, it took on a life of its own. Very much like the *Semita recta* copies, the surviving manuscripts of the *Mirror of Lights* exhibit striking variability. The most important witnesses are given in the table.[19]

Table 1. *Manuscripts of the* Mirror of Lights

Manuscript	Comment
British Library MS Harley 3542 (fols. 1r–14r), 15th c.	2nd and 3rd parts (English)
British Library MS Harley 3542 (fols. 35r–41r), 15th c.	2nd (incomplete) and 3rd parts (Latin)
British Library MS Sloane 316 (fols. 8r–54r), 16th c.	1st part from *Semita recta*; 2nd and 3rd parts (English)
British Library MS Sloane 513 (fols. 155r–168r), 15th c.	2nd and 3rd parts (English)
British Library MS Sloane 3580A (fols. 193v–208v), 16th c.	2nd and 3rd parts (English)
Cambridge University Library, MS Kk. 6. 30 (fols. 1r–10v), 15th c.	2nd and incomplete 3rd part (English)
Trinity College, Cambridge, MS R. 14. 37 (fols. 115r–147r), 15th c.	2nd and 3rd parts (English)
Trinity College, Cambridge, MS R. 14. 45 (fols. 67r–77v), 15th c.	2nd and 3rd parts (English)
Trinity College, Cambridge, MS O. 2. 33 (Part II, pages 1–37), 16th c.	1st part (Latin); 2nd and 3rd parts (English)
Bodleian Library MS Ashmole 1423 (Part V, pages 19–55), 16th c.	2nd and 3rd parts (English)
Corpus Christi College, Oxford, MS 175 (fols. 9r–15v), 17th c.	1st part and fragment of 2nd part (Latin)

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[19] A full list of manuscripts, including some very fragmentary versions, can be found in Grund, "'ffor to make Azure'," 33, 35.

A few interrelated aspects of the manuscripts stand out. The full text only survives in one single copy (as far as I have been able to ascertain), Trinity College, Cambridge, MS O. 2. 33. Part 1 is scarce in the copies of the *Mirror of Lights* (the division will be discussed in more detail later). It is only attested in one copy apart from MS O. 2. 33: Corpus Christi College, Oxford, MS 175, a seventeenth-century copy. The peculiar nature of the surviving manuscripts is underscored by another facet of them: There are only three copies partially or wholly in Latin, while English vernacular copies are much more frequent. As I have suggested elsewhere, it is not easy to trace the factors that created these patterns.[20] The lack of Latin manuscripts is particularly difficult to explain. The infrequency may be due to a limited circulation in Latin or, conversely, extensive use of the Latin manuscripts as handbooks, which may have curtailed their survival rate.[21] But neither of these explanations is entirely convincing.

The question why Part 1 only occurs in two manuscripts and exclusively in Latin is perhaps easier to answer. Although the English manuscripts of the *Mirror of Lights* present slightly different versions of the text, they probably all stem from one and the same translation. This ur-*Mirror of Lights* may simply have left out the first part. This omission is not too surprising in an English vernacular version of an alchemical text. In the first wave of translations and adaptations of Latin texts on alchemy into English in the fifteenth century, texts with a primarily practical bent seem to have been the primary target; theoretical texts, especially those in

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[20] In this discussion, I draw on Grund, "'ffor to make Azure'," 32–38.

[21] It is technically possible that the *Mirror of Lights* was originally written in English and subsequently translated into Latin. This fairly unusual procedure can be observed in cases such as George Ripley's *Compound of Alchemy*, written in English around 1471, and translated into Latin for Ripley's collected works *Georgii Riplaei Canonici Angli opera omnia chemica* (Kassel, 1649). For texts that went from a vernacular language to Latin, see also Michela Pereira, "Alchemy and the Use of Vernacular Languages in the Late Middle Ages," *Speculum* 74 (1999): 336–56, on 336. In the case of the *Mirror of Lights*, an English-Latin translation is very unlikely, however, not least because Part 1 is not found in the English versions but is found in Latin. For a more in-depth discussion, see Grund, "'ffor to make Azure'," 32–38.

prose, or indeed theoretical sections of texts do not appear to have attracted the same attention.[22]

Part 1 of the *Mirror of Lights* is very much concerned with theoretical aspects of alchemy, and may have been omitted by a translator primarily interested in the practical pursuit of alchemical secrets. What is particularly significant for my subsequent discussion is the recognition that the *Mirror of Lights* seems mostly to have circulated in an incomplete state (if indeed the extant manuscripts provide an accurate picture of the circulation).

Redactional Strategies

Setting about transforming the *Semita recta* into the *Mirror of Lights*, the redactor had a clear program in mind. He made changes on all levels of the *Semita recta* to produce the *Mirror of Lights*. The most conspicuous changes were made on the structural level. Figure 1 provides an overview of the transformation that the *Semita recta* has gone through in the hands of the redactor. I will focus on some of the general patterns here and return to some of the more detailed features later.

[Figure 1 Here]

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[22] For bibliographical surveys of English vernacular texts on alchemy, see George R. Keiser, *A Manual of the Writings in Middle English 1050–1500. Volume X: Works of Science and Information* (New Haven, CT: The Connecticut Academy of Arts and Sciences, 1998), 3627–3637, 3788–3808; Linda E. Voigts and Patricia D. Kurtz, *Scientific and Medical Writings in Old and Middle English: An Electronic Reference* (Ann Arbor, MI: The University of Michigan Press, 2000). An updated, online version, *eVK2*, is found at http://cctr1.umkc.edu/cgi-bin/search. Very illustrative examples of the excising of theoretical parts of texts are also found in the 15th-century alchemical compilation Trinity College, Cambridge, MS R. 14. 37, which is written almost completely in English. This massive volume contains, for instance, (pseudo-)Aristotle's *De perfecto magisterio* (also sometimes attributed to Rhazes), but limits its inclusion to the *practica* while leaving out the lengthy *theorica*. For this text, see Dorothea W. Singer, *Catalogue of Latin and Vernacular Alchemical Manuscripts in Great Britain and Ireland, Dating from before the 16th Century* 3 vols. (Brussels: Maurice Lamertin, 1928, 1930, 1931), in vol. 1, §114; Lazarus Zetzner, *Theatrum chemicum* vol. 3 (Strasbourg, 1659), 76–127 (as accessed at http://www.wbc.poznan.pl/dlibra/doccontent?id=8717).

The redactor producing the *Mirror of Lights* imposed a much more rigorous structure or *ordinatio* on the text than that found in the *Semita recta*. Although I have divided the *Semita recta* into five meta-categories, these categories are not structurally marked in the text. Rather, the *Semita recta* relies simply on a chapter structure where the individual discussions are introduced by headings such as "Quomodo fit cerussa, et unde," 'How is ceruse made, and from where' (although some copies leave out the headings).[23] There is also an implicit, logical progression in the *Semita recta* from background information on the practicing of alchemy and introductory material on equipment and substances to advanced instructions on practical procedures necessary for the production of the elixir. At the same time, there is frequent overlap of practical sections or recipes and description or theory.

While the *Mirror of Lights* retains this basic sequence of the *Semita recta* (introduction–equipment/substances–procedure), the redactor had a completely different idea about organization and categorization. He provided a strict hierarchical division of the text, starting with three parts. These in turn fall into several subcategories, which are further separated and categorized. Importantly, the redactor's concept of organization also involved reshuffling of material, not simply a carving up of the original material into neat categories (as is indicated in the figure and will be discussed in more detail below). In a way, the redactor was very much a compiler in the medieval sense that he added comparatively little of his own: the resulting text is primarily a re-organization of previous material.[24] However, he does not seem to have collected

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[23] Borgnet, *Opera omnia*, 558. All the *Semita recta* copies included in this study contain some kind of heading/title system, although the heading/title does not always appear on a separate line.

[24] For the concept of medieval compilation (*compilatio*), see M. B. Parkes, "The Influence of the Concepts of Ordinatio and Compilatio on the Development of the Book," in *Scribes, Scripts and Readers: Studies in the Communication, Presentation and Dissemination of Medieval Texts*, ed. M. B. Parkes (London: Hambledon Press, 1991), 35–69, on 59–64.

together information from a great number of sources; instead, his "compilation" depended almost

exclusively (as far as I can tell) on one single text: the *Semita recta*.[25]

The first structural level, the three parts, is clearly marked through a *divisio textus*

appearing at the very beginning of the text. It claims that:

In p*r*ima v*er*itas alkimie sollicite inuestigat*ur*. In .2.ᵃ co*n*dici*on*es p*er*tine*n*tes alkimie exp*r*esse notifica*ntu*r In 3ᵃ p*ar*te v*er*a et p*er*fecta op*er*a alkimie pleni*us* declare*ntu*r. (*Mirror of Lights*, Corpus Christi College, Oxford, MS 175, fol. 9r)
['In the first [part] the truth of alchemy is carefully investigated; in the second, conditions that pertain to alchemy are explicitly noted; in the third part, true and perfect procedures of alchemy are declared fully'.]

The redactor's aim is clearly to have three parts with three different goals: first, theory and

justification of alchemy; second, basic information on substances, procedures, and some

fundamental pitfalls; and, third, practice. To fit this overarching idea the redactor had to reshuffle

some *Semita recta* material. Among the most notable shifts is the removal of the practical recipes

to Part 3 from their earlier position in the *Semita recta*, in which they were integrated with the

actual descriptions of the substances involved (I will return to this in detail later). The *divisio*

textus is underscored throughout the three parts. Especially notable is the textual "glue" that the

redactor adds in transitions. As the text transitions from Part 2 to 3, the *Mirror of Lights* states:

¶ And thus endith the secound part of this book callid þe mer*our* of lyght*es* ¶ Here bygynnys the thridd part of þe laste of þ*is* book þ*at* is þe Mer*our* This mer*our* of lyghtes schewyn vntil alle parfyt werkys ¶ ffirst p*r*eparaciou*n*s/ tha*n*ne sublymaciou*n*s ¶ The*n*ne fixiou*n*s and soluciou*n*s/ Rubyficaciou*n*s/ Distillaciou*n*s Coagulaciou*n*s Calcynaciou*n*s of metallez Reducciou*n*s of calcys & p*er*ficciou*n*s of Philosophre stonys And by cause þat sal comune is berere of þe keye in this craft we wole bygynne at hym. (*Mirror of Lights*, Trinity College, Cambridge, MS R. 14. 37, fols. 125r–v)

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[25] However, as we shall see later, the redactor did elaborate on some sections in the *Semita recta*, but in doing so, he seems primarily to be drawing on the *Semita recta*, taking some of its discussions and arguments to the logical conclusion.

In addition to strengthening the separation between theory/description and practice, this

metatextual sequence also guides the reader in outlining the major sections to follow. The

redactor clearly had his end user in mind.

On the second structural level, especially within Parts 1 and 2, there is further

subcategorization, which is not inherited from the *Semita recta*. Part 1 introduces thirteen

conclusions, whose sheer logic allegedly proves that alchemy is a true science. The scientific

status of alchemy is further underscored through the refutation of eight objections by eight

solutions, which are presented as if they were self-evident in their logic. To produce these

categories (conclusions, objections, and solutions), the *Mirror of Lights* collects together and

elaborates on the *Semita recta*'s introductory sections, sometimes in a remarkably complex, yet

clearly premeditated way, as we shall see.

Similarly elaborate processes of reworking are evident within Part 2. The structure

of this part revolves around three "conditions": material, formal, and preceptual.[26] It is not

difficult to see how the redactor came up with the preceptual conditions: The *Semita recta*

already contains a series of precepts or commandments that it advises the prospective alchemist

to follow. For example, it is recommended that the practitioner have a special place for

experimentation consisting of two or three chambers, hidden away from the sight of ordinary

people.[27] The formal conditions, on the other hand, have their origin in a suite of discussions on

procedures in the *Semita recta*. However, unlike the precepts, they are not treated in a numbered

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[26] There are various permutations of these conditions. Some manuscripts of the *Mirror of Lights* add "natural" conditions as a category, but never discuss it (e.g. Trinity College, Cambridge, MS R. 14. 45). This is probably an indication that it is a misreading or doubling of *material*, which looks very similar to *natural* in many late medieval hands. Corpus Christi College, Oxford, MS 175 presents a very different set of conditions, starting out with three overarching conditions: essential, preceptible, and instrumental. It then further subcategorizes e.g. essential conditions into material and formal conditions. This strategy is not found elsewhere. It makes clear that the redactor's work of categorization was elaborated on by subsequent scribes. For a major adaptation of the *Mirror of Lights*'s Part 2, see the discussion in Peter Grund, *"Misticall Wordes and Names Infinite": An Edition and Study of Humfrey Lock's Treatise on Alchemy* (Medieval and Renaissance Texts and Studies [MRTS], Arizona Center for Medieval and Renaissance Studies, Arizona State University, forthcoming).

[27] Borgnet, *Opera omnia*, 549.

list in the *Semita recta*. The redactor might have been cued by the precepts to present the formal

conditions (i.e. the procedures) as a list. In that way, he was able to create a structured parallel

between the two. The desire for parallelism might also have been the reason behind the material

conditions. The *Semita recta* simply discusses a number of substances, perhaps in order of

importance (starting with the four spirits, including mercury, sulfur etc.). The *Mirror of Lights*

provides a frame for all these discussions. After all, what connects all of them is that they concern

materials.

This type of pedagogic categorization and subcategorization is of course not

peculiar to the *Mirror of Lights*. Carving up texts in neat categories, supplying *divisiones textus*,

and providing other reading aids were staples of scholastic textual techniques, which derive

ultimately from the teaching methods of the universities and from textbooks, commentaries, and

treatises originating in a university context. By the fifteenth century, these techniques had fairly

wide currency, being employed in texts from a variety of domains, from theology and medicine

to literature, although with varying degrees of sophistication.[28] There is even precedence in other

alchemical texts for the *Mirror of Lights*'s treatment. Written sometime in the middle of the

fourteenth century, Petrus Bonus's *Margarita pretiosa novella*, an assiduous defense of the

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[28] Philipp W. Rosemann, *The Story of a Great Medieval Book: Peter Lombard's* Sentences (Peterborough, Canada: Broadview, 2007). See also Parkes, "The Influence," 37, 49, 57; Luke Demaitre, "Scholasticism in Compendia of Practical Medicine, 1250–1450," *Manuscripta* 20 (1976): 81–95, on 82, 92–94; George R. Keiser, "Serving the Needs of Readers: Textual Division in Some Late-Medieval English Texts," in *New Science out of Old Books: Studies in Manuscripts and Early Printed Books in Honour of A. I. Doyle*, eds. Richard Beadle and A. J. Piper (Aldershot: Scolar Press, 1995), 207–226, esp. on 207–210; George R. Keiser, "*Ordinatio* in the Manuscripts of John Lydgate's *Lyf of Our Lady*: Its Value for the Reader, Its Challenge for the Modern Editor," in *Medieval Literature: Texts and Interpretation*, ed. Tim William Machan (Binghamton, NY: Medieval & Renaissance Texts and Studies, 1991), 139–157, esp. on 143–145, 148–155; W. L. Braekman, "Bollard's Middle English Book of Planting and Grafting and Its Background," *Studia Neophilologica* 57 (1985): 19–39, on 26–27.

legitimacy of alchemy, provides a number of scholastic reading helps and distinctions, from

divisiones textus, and chapters, to classification of the text into parts, distinctions, and solutions.[29]

While the *Mirror of Lights*'s adoption of scholastic techniques may not be unique in

the context of alchemical texts, it is still unusual in its systematic care and in its employment of

the techniques as part of a conscious program to rewrite and improve on a previous text. The

redactor's use of the techniques has several important implications. It is most likely an indication

that the redactor should be situated in a university milieu, considering his intimate familiarity

with the techniques; this possibility in turn may point to the continuing interest in the debated

scientific status of alchemy in university circles (see below). On the other hand, and perhaps even

more importantly, the textual strategies communicate the seriousness and commitment that he

must have had for his project. The stringent structure was perhaps part of the overall strategy and

goal of the text. Alistair Minnis suggests that some medieval texts in the vernacular adopted

strategies found in commentaries (such as glosses and prologues) "which at once described

certain aspects of those texts and tacitly claimed a degree of prestige for them (because that

apparatus was of the type which conventionally had accompanied works of the revered

auctores)."[30] A similar strategy may be at work here. The redactor produced an alchemical

treatise that follows other texts whose legitimacy was unimpeachable by adopting the same

textual and presentational strategies. By doing this, he may have attempted to give authority to

the text. Again, presentation and structure are closely connected with content: A text that utilizes

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[29] Lazarus Zetzner, ed., *Theatrum chemicum*, vol. 5 (Strasbourg, 1660), 567–794 (as accessed at http://www.wbc.poznan.pl/dlibra/doccontent?id=8719). See also Chiara Crisciani, "The Conception of Alchemy as Expressed in the *Pretiosa Margarita Novella* of Petrus Bonus of Ferrara," *Ambix* 20 (1973): 165–181.
[30] Alistair J. Minnis, *Medieval Theory of Authorship: Scholastic Literary Attitudes in the Later Middle Ages*, 2nd ed. (Philadelphia, PA: University of Pennsylvania Press, 1988), xi.

the current "scientific" standards in presentation could perhaps elevate the importance of its

content.[31]

Part 1: The Validity of Alchemy

Proving the validity of alchemy as a science was clearly in the forefront of the redactor's mind.

He reveals as much explicitly at the very beginning of Part 1:

Om*ne* firmu*m* op*us* edificandu*m* fundamentu*m*, firmu*m* exigit et requirit S*ed* om*ne* op*us* tr*a*nsformati*onu*m metall*orum*. sup*er* alkimiam velut sup*er* fu*n*damentu*m* solidu*m* e*st* fundatu*m* Expedit igit*ur* i*n* p*r*incipio p*er* investiga*cione*m videre si hec scien*cia* firma fu*er*it atq*ue* ver*a* Quap*r*opter in ista p*r*ima p*ar*te p*r*ocedit*ur* in ista forma p*r*imo p*r*emittu*ntur* queda*m* conclusi*one*s ph*i*los*oph*orum ta*m*qua*m* hui*us* artis p*r*incipia. S*ecun*do q*u*oq*ue* adducu*ntur* artis obiec*cio*ne*s* Terc*io* ostendit*ur* [sic] dubior*um* solu*ci*ones ex q*u*ib*us* pat*et* ta*m* firmitas qua*m* v*er*itas hui*us* artis. (*Mirror of Lights*, Corpus Christi College, Oxford, MS 175, fols. 9r–9v)
['Every established work that is aimed to educate must have and requires a firm foundation, but every work that deals with the transformations of metals is based on alchemy as a solid foundation. It is therefore advantageous to see in the beginning through an investigation whether this science is well established and true. Therefore, in this first part it will be proceeded in the following manner. First, certain conclusions by philosophers are put forth as principles of this art. Secondly, objections to this art are also added. Thirdly, solutions to the problems are shown. From these the well-established nature as well as truth of this art is clear'.][32]

The redactor was of course not alone in attempting to prove the scientific status of alchemy.

Fitting alchemy into a scientific framework had been a perennial concern for alchemists and

others since the early transmission of alchemical literature into Latin in the late twelfth century,

and with the translation of the works of Aristotle, the target became to incorporate alchemy

within his concept of natural science.[33] The redactor was thus addressing a century-long issue.

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[31] A similar claim may even be made about the *Semita recta*. Robert Halleux points out that the *Semita recta* is written in a clear and concise style worthy of Albertus's authentic writings ("un style clair, concis, digne des traités scientifiques d'Albert"). What the writer of the *Semita recta* may have attempted to do was to exploit Albertus's textual strategies to provide an aura of "scientificness" as well as to link the work to Albertus by emulating his style. Either way, the goal would have been to bestow authority and credibility on the text. Robert Halleux, "Albert le Grand et l'Alchimie," *Revue des Sciences Philosophiques et Théologiques* 66 (1982): 57–80, on 76.

[32] It is not clear whether the redactor makes a systematic, epistemological distinction between alchemy as *ars* (the individual technical procedures and practicum) and alchemy as *scientia* (the more general principles). The reference to both in many sections may indicate that he does see a distinction, although there are also passages where the distinction is less than clear. For the difference between, intersection of, and complexities of the concepts of *scientia* and *ars*, see the various contributions in Ingrid Craemer-Ruegenberg and Andreas Speer, eds., Scientia *und* ars *im Hoch- und Spätmittelalter* (Berlin: Walter de Gruyter, 1994), vols. 1–2.

[33] See e.g. Chiara Crisciani, "Alchemy and Medicine in the Middle Ages: Recent Studies and Projects for Research," *Bulletin de philosophie médiévale* 38 (1996): 9–21; Obrist, *Constantine*, 5, 29–32. See esp. Petrus Bonus's

His approach to it, however, was not to directly discuss alchemy's relation to and position vis-à-vis other sciences, as in many other treatments. Instead, his arguments are very much internal to alchemy, relying heavily on logic and syllogistic and dialectic reasoning. Most importantly, underscoring this approach is his choice of textual strategies and structure. He utilizes a setup of conclusions, objections, and solutions (outlined in the quote above), which is the redactor's own invention as is the sequence of the description; the content, on the other hand, is largely that of the *Semita recta*, with some important elaborations. He thus uses the *Semita recta* in a revamped form to launch his defense of alchemy.

The redactor restructured the *Semita recta*'s initial discussions on errors by previous alchemists, on the origin of metals, and the defense of alchemy (such as it is) into thirteen conclusions, eight objections, and eight solutions. While the conclusions deal primarily with the question of the origins of metals and the possibility of transmutation, the eight objections and solutions deal with allegations of a number of flaws in alchemical procedure from unspecified detractors and the subsequent resolution of the perceived deficiencies. The objections are usually dispensed with fairly summarily as, for example, in the case of the fourth objection.

Quarto sic visu*m* est: quod aliqui fecerunt bonas subli*maciones* et soluc*iones* et et [sic] destillac*iones*, sed ex prolongatione operis facti sunt tediosi, ita quod totu*m* demiserunt (*Mirror of Lights*, Trinity College, Cambridge, MS O. 2. 33, p. 9)
['Fourthly, it is shown that some make good sublimations and solutions and distillations, but because of the extended time of the work they are bored/made tired so that they give up the whole enterprise'.]
Ad quartam dicendu*m* est ~~causa quare~~ quod illa obieccio arguit defectum illoru*m*, qui noluerunt expectare finem et non defectu*m* sciencie (*Mirror of Lights*, Trinity College, Cambridge, MS O. 2. 33, p. 10)
['To the fourth [objection] it must be said that this objection reveals the deficiency of those who cannot wait for the end [of the work], not a deficiency in the science [of alchemy]'.]

This categorization reveals the redactor's intimate familiarity with scholastic dialectics, which focused on contrasting opposing views and then providing a solution. These

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Margarita pretiosa novella; Zetzner, *Theatrum chemicum*, 567–794 (as accessed at http://www.wbc.poznan.pl/dlibra/doccontent?id=8719); Crisciani, "The Conception."

strategies have been shown to be widely employed in particular in theological treatises and commentaries between the thirteenth and fifteenth centuries. The redactor certainly did not lack for textual models. For example, very similar to the *Mirror of Lights* in the adoption of textual strategies is the *Defensiones theologiae divi Thomae Aquinatis* ('Arguments in defense of the theology of the holy Thomas Aquinas') by the French Dominican John Capreolus, which was finished in the first third of the fifteenth century.[34] Capreolus's discussion is rigidly structured along a number of categories, including *conclusions*, *objections*, and *solutions*. With the help of these categories, Capreolus outlines first the position of Aquinas, whose statements Capreolus sets out to defend, followed by "objections" to Aquinas's theology found in other theologians' work. These objections are subsequently refuted.[35] This dialectic format is exactly that of the *Mirror of Lights* as well. The one difference is that the *Mirror of Lights* is not as strictly linear as Capreolus's *Defensiones*. Capreolus is guided by an overall goal where each initial conclusion is rejected in the objection only to be redeemed in the refutation of the objection. In the *Mirror of Lights*, the objections and solutions are intimately connected in that the latter respond to the former. However, the initial conclusions do not feed into the discussion of the objections and solutions; rather, the conclusions are concerned to prove that alchemy is logical since its premises are logical. The redactor's hands may have been tied to a certain extent in this case, because of his general reluctance to add much material from elsewhere but instead rely primarily on the *Semita recta*: He had to use the material at his disposal, which may not have lent itself easily to a strict dialectic structure as in Capreolus's *Defensiones*. However, what the conclusions, objections, and solutions all contribute to is the redactor's argument that alchemy is "a true science and well-established art."

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[34] Rosemann, *The Story*, 140–141.
[35] Rosemann, *The Story*, 142–143.

The textual alchemy of Part 1 is not only evident on the structural macrolevel, but also in the internal organization of the conclusions, objections, and solutions. The re-organization of the *Semita recta* is substantial and highly structured: The redactor seems to have had clear principles for his reworking. A description of the *Mirror of Lights*'s third and fourth conclusions will illustrate the overall strategy. The third and fourth conclusions outline nature's striving for perfection and the differences between metals in accidental form or quality (that is, what color they have and what their degree of corruption or cleanness is). The redactor made a number of significant changes to the *Semita recta* to produce these conclusions. Table 2 provides a comparison of the two texts.

Table 2. *The Third and Fourth Conclusion*

Semita recta (Borgnet §2, p. 547)	*Mirror of Lights* Trinity College, Cambridge, MS O. 2. 33 (pp. 2, 3)
Quando vero [sulphur] mundum et album occurrit argento vivo in terra munda, inde generatur argentum, **quod differt ab auro in hoc, quod sulphur in auro rubeum, in argento album fuerit.** Quando autem sulphur rubeum, corruptum et urens occurrit argento vivo in terra, inde generatur cuprum, **et non differt ab auro nisi in hoc, quod in auro non fuit corruptum, hic vero corruptum.** […]	[Third Conclusion] Quando vero sulphur albu*m* & mundu*m* occurrit ar*g*ento vi*v*o in terra munda, inde genera*tur* argentu*m* Quando sulphur rubeu*m* corruptu*m* & vrens occurrit argento vivo in terra mvnda: inde generatur cuprum. […] [Fourth Conclusion] **Quia argentu*m* puru*m* non defert ab auro pvro nisi in hoc, quod sulphur in auro est rubeu*m*, et sulphur in argento est album** quia sicut superius est probatu*m*, o*mn*ia metalla ex sulphure & argento vivo generant*ur*, Sed albedo & rubedo sunt forme accidentales quia qualitates, ergo argentu*m* puru*m* et auru*m* puru*m* differunt solis formis accidentalibus, **Item cupru*m* non differt ab auro nisi in hoc quod sulphur in auro est mundu*m* auru*m* generatur in terra mvnda: Sulphur in cupro est corruptu*m***, cupru*m* generatur in terra immvnda et fetida, ex qua contrahitur corrupcio, Sed immunditia et corrupcio sunt forme accidentales, quia

	qualitates ergo auru*m* puru*m* & cupru*m* differunt solis formis accidentalib*us* <u>Item {cuprum} non differt ab argento puro nisi in hoc, quod sulphur in argento puro est album & mundu*m*, et argentu*m* puru*m* generatur in terra munda,</u> Et sulphur in cup*ro* est rubeu*m* et corruptu*m* et cupru*m* generatur in terra fetida & immu*n*da ex qua similiter contrahit corrupcionem, Sed albedo et rubedo ~~sunt~~ immudicia [sic] & corrupcio sunt forme accidentales: quia qualitates: Ergo argentu*m* puru*m* et cupru*m* differunt solis formis accidentalibus,

As seen in the text comparison, the *Semita recta* discusses *both* how different metals are created *and* how they differ from each other in one and the same section. The *Mirror of Lights*, on the other hand, prefers a clear separation of the two topics: It outlines how different metals are created in the third conclusion and postpones the discussion of how metals differ to the fourth conclusion. I have marked in bold those sections in the *Semita recta* that appear in the fourth conclusion in the *Mirror of Lights*. The separation and reorganization of more or less unrelated topics is one of the more common redactional strategies in the *Mirror of Lights*, which will become more evident in the discussion of Parts 2 and 3.

The passage cited from the fourth conclusion also exhibits another redactional strategy found in some sections in Part 1 of the *Mirror of Lights*. The redactor sometimes elaborates on cryptic or terse formulations in the *Semita recta*, perhaps sometimes inspired or guided by other sources.[36] The goal of the fourth conclusion is clearly to delineate the major differences between metals in accidental form or quality, that is, color or degree of corruption or cleanness. The *Semita recta* does not stress these differences; it simply states at the beginning of Section A (§2 in the Borgnet edition): "Et notandum, quod metalla differunt inter se accidentali

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[36] I have not been able to pinpoint a particular source for these additions. They may completely represent expansions by the redactor.

forma tantum, non essentiali" ('it should be noted that metals differ only in accidental form and not in essential').[37] The *Semita recta* then sprinkles a few comments here and there in the text about accidental form. The brevity of these comments and their inconsistent appearance must have been what triggered a much more elaborate discussion in the *Mirror of Lights*. The text in the table demonstrates that the *Mirror of Lights* not only compares copper to gold, as in the *Semita recta*, but also to silver (this passage is underlined). In the subsequent passages (not included in the table), the *Mirror of Lights* discusses other metals (such as tin, iron, and lead) and compares them all to gold and silver in the same meticulous way as it did copper. After each comparison, the redactor also underscores that, since all the dissimilarities consist in the degree of corruption and cleanness or in color, the metals differ exclusively in accidental form. It may seem more than redundant to have this kind of elaborate description of the differences. However, the elaboration is very much in accordance with what appears to be the overall goal of Part 1: to firmly establish the validity of alchemy as a science built on sound logical reasoning. Following up on and consolidating scattered and new evidence provides comprehensive coverage and less room for doubt.

Parts 2 and 3: Description and Practice

The guiding principle behind Parts 2 and 3 was clearly to provide a sharp distinction between description/theory and practice: The redactor collected together and elaborated on introductory material in Part 2 and postponed all the recipes or sections of a practical nature to Part 3. One of the most fundamental transformations of the *Semita recta* along these lines involved the

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[37] Borgnet, *Opera omnia*, 547.

separation of the initial description of substances and their preparation. A particularly striking

and representative example is the treatment of common salt.[38]

Table 3. *Common Salt*

Semita recta (Section B, Borgnet §18, pp. 554)	*Mirror of Lights* Trinity College, Cambridge, MS R. 14. 45 (fols. 68r–68v, 70v)
Quid valeat sal commune, et quomodo praeparetur? *Sal commune* est claviger hujus artis, quia claudit et aperit omnia, et sine illo nullum opus Alchimiae perfici potest. **Praeparatur autem sic: Accipe de eo quantum vis, et solve ipsum in mortariolo cum aqua calida movendo, donec solutum sit, tunc cola per pannum spissum in vas lineum [sic!=ligneum], et quod remanet supra fundum, iterum cum aqua calida, sicut prius, solve, donec totum sit solutum. Tunc aquam illam coque in vase vitreo, aut plumbeo, aut cupreo, donec aqua evanescat, et sal revertatur in priorem statum. Tunc accipe illud sal, et pone in ollam novam ad furnum calcinationis (olla debet claudi) et sicca optime, et serva usque dum doceam te qualiter debes solvere et distillare.**	[Part 2] Sal co*m*mune beris the keye of this crafte ffor he openes and closes all thyng*es* And withouten*e* hym no werke of alkemye may be made or wrought […] [Part 3] **Salt co*m*mune is þus p*r*eparat first he shall be solued in hote water and clensid þurgh a thikk clothe into a vessell of tre And that þat leues yn the grounde put more wat*er* thereon standand[A] hote till it be dissolued all and put it into erthen*e* panne or of brasse and lete the watre vapre awey & then put it into an erthen*e* potte and kepe it allewey warme tyll I teche þe to Sublyme and to solue þerwithall**

A "standand": Dialectal form of *standing*.

As the table illustrates, the *Semita recta* first describes what common salt is and then, in the same

section, it fairly logically presents a recipe on how to prepare it. The *Mirror of Lights*, on the

other hand, places the initial description of common salt in Part 2, and, in accordance with its

general strategy, removes the recipe (marked in bold) to Part 3. The redactor employs the same

procedure in the *Mirror of Lights*'s treatment of all sections in the *Semita recta* that mix

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[38] The *Semita recta* and the *Mirror of Lights* exhibit some differences in formulation and some minor differences in procedure. The other manuscripts of the *Semita recta* that I have consulted illustrate that these dissimilarities are probably not the result of the redactor's reworking; rather, the *Semita recta* manuscripts reveal a great deal of internal variation in this section.

description and practical instruction, such as sal alkali, tartar, and alum. It thus ends up with a

catalogue of substances crucial to the practice of alchemy in Part 2, and a coherent collection of

similarly-worded recipes in Part 3.

The larger organizational structure of Part 2 into three conditions (material, formal,

and preceptual), mentioned earlier, is matched by further subcategorization within the three

conditions. Creating groupings and providing descriptive labels for them seem to have been close

to an obsession with the redactor. Two illustrative examples of this hierarchization come under

the general heading of Material conditions. In the *Semita recta*, the different kinds of salts (sal

ammoniac, common salt, and sal alkali) are simply described in three sequential chapters or

sections. The *Mirror of Lights*, by contrast, adds a short introduction, bringing the three

discussions together under the umbrella heading of salts: "Saltes are thees Sall Armoniac Sal

co*m*mune Sall Alkely."[39]

Similarly, the sections on alum, atrament, tartar, verdigris, cinnabar, ceruse,[40] and

minium, which are found in sequential chapters/sections in the *Semita recta*, are categorized

under the umbrella heading of "flowers" in the *Mirror of Lights*: "Floures are thees flour*e* of

Tart*ar* fflour of Alym fflo*ur* of Att*ra*ment fflo*ur* of Cop*er* / fflour*e* of v*er*milon / fflo*ur* of lede."[41]

Classification and categorization were clearly important to the redactor.

Although one of the *Semita recta*'s characteristic features is its comprehensive

treatment of alchemical practice in all its facets, the redactor clearly did not feel that the original

was sufficiently comprehensive. This is particularly evident in that the redactor supplies entries

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[39] *Mirror of Lights*, Trinity College, Cambridge, MS R. 14. 45, fol. 68r.

[40] Note, however, that the recipe for azure precedes the discussion of ceruse. Azure is not included in the *Mirror of Lights*'s list, but the recipe is retained in Part 3.

[41] *Mirror of Lights*, Trinity College, Cambridge, MS R. 14. 45, fol. 68v. For *flower* in the meaning 'the pulverulent form of any substance, *esp.* as the result of condensation after sublimation', see *Oxford English Dictionary*, www.dictionary.oed.com, s.v. *flower* 2c (as accessed February 2009). The Latin version of *Mirror of Lights* found in British Library MS Harley 3542 consistently uses *flos* 'flower' (or an inflected form).

on several categories of substances in the *Mirror of Lights* that are not discussed in any detail in

the *Semita recta*. Among these supplements are discussions of calxes ('metals in a powder form'

[usually as a result of 'calcination,' a process of roasting or burning]),[42] ashes, vinegar, aqua

dulcis, and urine of men and children. At the same time, although the *Semita recta* does not

present these in individual sections as in the case of mercury, sulfur and similar substances, it

does mention them as ingredients in various recipes and procedures. The redactor producing the

Mirror of Lights simply upgraded them to the status of the other, explicated substances and gave

them their own entries. In doing so, the redactor did not really add much information that was not

already available in the *Semita recta*. Instead, the *Mirror of Lights* largely limits itself to

recording the procedures in which the particular substance is useful; no information is provided

concerning characteristics or origins as in the entries for sulfur, mercury, and other substances

that already receive special treatment by the *Semita recta*. For the entry on vinegar, for example,

the *Mirror of Lights* basically provides a list of the procedures that require vinegar:

Vynegre Vynegr*e* helpes in the purgynge of Spirites/ in sublymaciou*n*s and calcynaciou*n*s of Sol and luna in p*r*epa*r*aciou*n*s of flo*ur*is and in p*r*epa*r*aciou*n*s of Sal Armoniac (*Mirror of Lights*, Trinity College, Cambridge, MS 14. 37, fol. 120r)

As is clear from this entry, the redactor does not make an effort to provide details about the

ingredient other than indicating the procedures in which vinegar is beneficial. Of course, in this

case, it may simply be that vinegar was not too difficult to obtain and did not require further

elucidation in terms of where it could be acquired or what its characteristics are. But readers or

alchemists could presumably have benefitted from having more elaborate descriptions of

substances such as calx vive ('quick lime') and various "flowers," which the redactor does not

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[42] See *OED*, s.v. *calx* (as accessed February 2009).

elaborate upon. In these cases, the redactor stays surprisingly faithful to the content of his source text.

Similar "elaborations" are found in the discussion of alchemical procedures. Among the formal conditions, which describe theoretical aspects of essential procedures in alchemical experimentation, the *Mirror of Lights* includes all of the procedures mentioned by the *Semita recta*, but adds two further procedures: preparation and fermentation. These are not innovations, however. The *Semita recta* does have descriptions of the preparations of common salt, of sal alkali, of "flowers," and of some additional substances, but it does not include them in its list of procedures proper. In his quest for structure and coherence, the redactor producing the *Mirror of Lights* supplies an entry on preparation among the formal conditions. His discussion, however, conforms to the general strategy of not supplying any additional information or explanations; instead, he limits himself to listing what substances the alchemist needs to prepare before he (or she) uses them.

The discussion of fermentation, on the other hand, has a more complex origin. After an introduction of the four spirits (i.e. mercury, sulfur, auripigmentum or arsenic, and sal ammoniac),[43] the *Semita recta* claims that the four spirits can help produce the elixir. The subsequent discussion of the *Semita recta* is given in Table 4 together with the *Mirror of Lights*'s entry on fermentation.

Table 4. *Fermentation*

Semita recta	Mirror of Lights
Semita recta (Section B, Borgnet §11, p. 552)	*Mirror of Lights* Trinity College, Cambridge, MS R. 14. 37, fol. 122r

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[43] There is great variation in the mansucripts as to what substances are classified as spirits.

Est autem *Elixir* nomen arabicum, latine vero significat fermentum: quia sicut panis fermentatur et levatur per bonum fermentum, ita massae metallorum transubstantiantur per hos quatuor spiritus in album et rubeum, et maxime per mercurium, quia ipse est fons et origo omnium metallorum. ['Elixir is an Arabic name, but in Latin it means leavening. For as bread is leavened and rises with the help of a good ferment, so the masses of metals are transformed with the help of these four spirits into white and red, and in particular by mercury, since it is the source and origin of all metals.]	Fermentacion*e* is to Ioynen well soullez and spirites togideres ffor ryght as brede is sourid with a lytill leveyne so is moche metall imparfyte maad parfyt/ whit or reed with a litil leveyne maad of a parfyt body & Spirit ioynid togider which leveyne is callid þe Elixer in Arabye and in latyn ffermente

The *Mirror of Lights* removes the discussion from its original context and makes it about the procedure rather than the elixir. Slightly surprisingly, the *Mirror of Lights* also seems not to follow the *Semita recta* slavishly, but extends the discussion: The *Semita recta* in the versions that I have consulted does not mention a combination of "souls and spirits." In keeping with his general strategy of creating coherence, the redactor also tries to integrate fermentation into the general framework of the text. One sign of this is that the redactor adds fermentation to the list of procedures that it advises practitioners to know in order to be successful. This advice comes in the fifth preceptual condition, which underscores that, unless the practitioner follows the sequence of procedures, the work will be in vain. Although fermentation is never explicitly invoked in the practical sections, it has a central role since the elixir is the crowning achievement for the intended reader of the *Mirror of Lights* (and the *Semita recta*).

As I have emphasized throughout, the redactor is loath to add material that is not in the *Semita recta* in some form or other or that can at least be deduced from the already existing discussion. However, there is one striking exception: a recipe for the preparation of Sal ammoniac (probably ammonium chloride). Sal ammoniac is a substance fundamental to several of the *Semita recta*'s procedures, such as the sublimation of mercury, and there is even a recipe

for the sublimation of sal ammoniac. However, while the *Semita recta* meticulously instructs on how to prepare common salt and sal alkali for further experimentation, sal ammoniac does not receive similar attention: In the copies of the *Semita recta* that I have consulted, no recipe on the preparation of sal ammoniac occurs. This was probably seen as a weakness by the redactor, whose goal was comprehensive and coherent coverage: He consequently added a recipe for how to prepare sal ammoniac. The source of this recipe is not clear. Similar recipes occur in other texts and as independent recipes in alchemical collections.[44]

If additions of non-*Semita Recta* material are rare in the *Mirror of Lights*, clear omissions of discussions in *Semita recta* are even rarer.[45] In a text that seems to take pride in being comprehensive, it is also the more surprising to see that what is omitted are such central descriptions in the *Semita recta* as those of furnaces and receptacles.[46] In the *Semita recta*, these sections give basic information on the appearance and making of different furnaces appropriate for various procedures as well as instructions on how to prepare the necessary vessels. In some manuscripts, these discussions are even accompanied by illustrations.[47] Such information would presumably have been essential for any practitioner of alchemy. So why would the redactor leave out this information, if his aim in other contexts was to improve on the *Semita recta*'s coverage? The answer might be as straightforward as the redactor's exemplar lacking those particular sections. That this is possible is evidenced by some of the *Semita recta* copies that I have consulted. The discussions of receptacles are present in the Middle English version of the *Semita*

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[44] Of course it is possible that a recipe did appear in the particular version of the *Semita recta* used by the *Mirror of Lights*, but it is conspicuous that it would be missing in all the copies that I have consulted. For similar recipes, see Voigts and Kurtz, *eVK2* 6399.00, 4229.00, and 5154.00. An additional crux with the recipe for preparing sal ammoniac is that the manuscripts have preserved two completely different recipes; the one cannot have developed out of the other; see Peter Grund, "Manuscripts as Sources for Linguistic Research: A Methodological Case Study Based on the *Mirror of Lights*," *Journal of English Linguistics* 34 (2006): 105–25, on 109.

[45] Note, however, the earlier discussion of the omission of most of the *Semita recta* preface.

[46] Borgnet, *Opera omnia*, 550–551.

[47] E.g. Corpus Christi College, Oxford, MS 226, fols. 61v–62r, and British Library MS Sloane 513, fol. 169r.

recta in Glasgow University Library MS Ferguson 205, but the descriptions of furnaces are missing.[48] British Library MS Harley 3542 has the discussion on furnaces but excludes almost completely the presentation of receptacles.[49]

Redactional Aim and Manuscript Use

The overall structuring of the *Mirror of Lights* into three parts facilitates two different, but not mutually exclusive uses of the text. First, it can be read as an alchemical treatise that progresses from a convincing argument about the validity of alchemy, to important introductory material, to the final practical sections that instruct the reader in a straightforward way how the elixir should be prepared. There are even some instructions in the text that clearly suggest that a sequential reading was intended by the redactor. At the end of the recipe for common salt, for example, the reader is instructed to keep the salt warm for subsequent procedures.[50] All in all, the *Mirror of Lights* thus seems to be a very pedagogically or didactically sound text, proceeding logically from point to point. It could serve both as the perfect textbook or primer for a beginning alchemist, and at the same time as a carefully crafted treatise whose aim was to document the fundamental logic of alchemical theorizing and practice. It is impossible to say whether it was the redactor's intention for his text to be used for actual, direct instruction at a university or elsewhere. As pointed out earlier, the redactor's close familiarity with scholastic techniques perhaps indicates that he had a connection to the university world. However, the introduction to the *Mirror of Lights* certainly does not hint at a narrow pedagogical goal; the redactor's aspirations seem to be much more general:

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[48] Halversen, *The Consideration*, 282–284.

[49] British Library MS Harley 3542, fols. 21r–21v. It is worth noting that this version of the *Semita recta* leaves out or abbreviates the text substantially in many sections.

[50] See Table 3. This advice is also present in the *Semita recta*.

erra*n*tes i*n* opp*eribus* alkimicis duce*n*tur in isto libro de tenebris erroru*m* ad Lume*n* splendidu*m* v*er*itatis q*ui*a sicut ambula*n*s i*n* Lumine Recte dirrigit*ur* ne deuiat aut incidat in errore*m* sic q*ui* secundu*m* doctrina*m* hui*us* libri p*ro*ced*ere* volu*er*it et op*er*ari p*er* vias rectas Ducet*ur* et fine*m* op*er*is consequ*a*tur (*Mirror of Lights*, Corpus Christi College, Oxford, MS 175, fol. 9r)[51]
['Those erring in their alchemical experiments are taken in this book from the darkness of their errors to the bright light of truth. For as the person who walks in light is directed in the right way so that he/she does not stray or fall into error, in the same way the person who aims to proceed and work according to the teaching of this book will be directed along the right paths and will reach the conclusion of the work'.]

There are aspects of the *Mirror of Lights* that suggest that it may not have been used as a comprehensive treatment of alchemical theory and practice, even if that was the redactor's intention. The fact that the *Mirror of Lights* in its entirety only exists in a single copy and is otherwise only found in a fragmentary state suggests that the full version of the *Mirror of Lights* did not have wide circulation.[52] It is therefore unclear to what extent the *Mirror of Lights* was read from beginning to end. Instead and perhaps more importantly, the structure also allows for a different use of the text, whether anticipated by the redactor or not. For readers who were already convinced about the validity of alchemy and for those who were already familiar with some substances and their preparation, the *Mirror of Lights* presents an easily accessible reference manual or handbook, where information on different aspects of alchemy has been clearly separated. More knowledgeable readers could thus easily dip into the book to check what it says about, for example, common salt or sublimation, without having to read material that may not be directly relevant or necessary for the readers at that point.[53]

Evidence for the use of the *Mirror of Lights* as a manual or reference book can be found in some of the manuscripts. An excellent example is Trinity College, Cambridge, MS R.

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[51] This section is not found in Trinity College, Cambridge, MS O. 2. 33, the only other copy of the *Mirror of Lights* that contains Part 1.

[52] See Table 1.

[53] The same could of course be argued about the *Semita recta* to a certain extent, although in the *Semita recta* the reader would not find the distinction between theory/description and practice as in the *Mirror of Lights*.

14. 37.[54] This is a long alchemical compendium most probably dating from the second part of the fifteenth century, written almost exclusively in English by one single scribe. There are two features of this manuscript that are particularly striking: its treatment of the texts it contains and the presentation of the texts. MS R. 14. 37 contains a very large number of texts or, more frequently, text extracts.[55] However, the texts included are not treated as different textual entities. Instead, they are all presented as one single, though loosely connected text or compendium, which is divided up into more than 350 chapters. A short description of each chapter can be found at the beginning of the volume, where the scribe has provided a meticulous index. He has also provided other finding devices such as running chapter headings, and he has marked off text sections by using different colors of ink.[56] One of the texts included is the *Mirror of Lights*, though only the second and third parts. It occupies chapters 262 to 340. Since the *Mirror of Lights* contains neatly separated descriptions or instructions on various topics, it must have lent itself particularly well to inclusion in this volume. Moreover, the primarily practical nature of the *Mirror of Lights* makes it fit well in this compendium, which seems to have an overwhelmingly practical bent: The compiler of Trinity College, Cambridge, MS R. 14. 37 seems to have aimed at having an easy reference guide for explorations of alchemical practice.

Concluding remarks

I have tried to demonstrate that the redactor who produced the *Mirror of Lights* appears to have been determined to improve on the *Semita recta*, which was already a fairly well-structured and

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[54] For a physical description of the manuscript, see http://rabbit.trin.cam.ac.uk/James/R.14.37.html.

[55] For the content, see Voigts and Kurtz, *eVK2*.

[56] MS R. 14. 37 constitutes important counter-evidence for George Keiser's claim that vernacular "copies of alchemical writings consistently lack apparatus that would help a reader discover their contents easily"; George R. Keiser, "Scientific, Medical, and Utilitarian Prose," in *A Companion to Middle English Prose*, ed. A. S. G. Edwards (Cambridge: Boydell and Brewer, 2004), 231–247, on 236. I am currently preparing a description of the characteristics of the apparatus and *mise-en-page* of this manuscript.

clear text. Driven by what appears to be a desire to "prove" the legitimacy of alchemy, the redactor provided a first part that addresses in a more structured and emphatic way the question of the validity of alchemy as a science; and he restructured the *Semita recta*'s mix of descriptive and practical discussions into two separate parts. In his restructuring, he put the text through a rigorous scholasticization process, where he employed scholastic textual techniques used in treatises of university origin, including texts commenting on and dissecting statements by the church fathers and other theological commentators. The redactor thus lavished on an alchemical text the same textual care that was afforded the most important topics of the day. This may have been part of his strategy to elevate the prestige of his project: Textual presentation presumably mattered for the credibility and authority of the text. To some extent, it may have performed the same function as pseudepigraphy in laying claim to importance. In all, the redactor's textual alchemy resulted in a highly focused, didactically sound, and easily accessible introduction to and exposition of alchemical practice. That the *Mirror of Lights*, especially Part 2 and 3, appealed to alchemical practitioners is clearly attested by the large number of extant manuscripts of the text. In fact, in an English vernacular context, the surviving manuscripts of the *Mirror of Lights* even outnumber those of the source of the redactor's revising efforts, the *Semita recta*.[57]

On a more general level, I believe it is clear that studying the textual strategies employed in presenting and restructuring of alchemical texts can contribute a great deal to our understanding of alchemical practice. Although alchemy was a practical art, it was also a textual one in the sense that alchemical texts were used to inform, instruct, and guide readers' exploration of alchemy, and perhaps even to convince the uninitiated. Much more research still remains to be done on the masses of alchemical manuscripts texts that lie unexplored to see how writers and practitioners of alchemy molded the texts in response to their own experience or

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[57] Grund, "'ffor to make Azure'."

influences from other texts. While we may now have some knowledge about practical and

theoretical aspects of alchemy in the Middle Ages, our understanding of the procedures and

strategies of rewriting alchemical texts still lags behind. Further exploration of this "textual

alchemy" is thus sorely needed.