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Sources of Astrology and Secret Knowledge in Konrad Kyeser's *Bellifortis*

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Sources of Astrology and Secret Knowledge in Konrad Kyeser's *Bellifortis*

ANTTI IJÄS

Around the turn of the fifteenth century, Konrad Kyeser of Eichstätt (1366–after 1405) composed his magnum opus on military technology and other technologies under the title *Bellifortis*. Composed in response to the embarrassing defeat of the crusader army at Nicopolis in 1396, the contents of this illustrated work range from descriptions of technical wonders and astrological phenomena to alchemical and magical recipes. In addition to the obscure hexametric captions in Latin composed by the author, the *Bellifortis* incorporates both verse and prose passages lifted from other extant sources. Some of the most notable examples are excerpts from the *Liber ignium* of Marcus Graecus which are included in the main manuscript, and material previously thought to have been lifted from Pseudo-Albertus Magnus's *De mirabilibus mundi* but now identified in the present article as excerpts from the anonymous *Liber vaccae*. In his prologue, Konrad explicitly states that he has collected material from Vegetius, someone called Antonius Romanus, and other authors. This article will discuss Konrad's sources on astrology, magical recipes, and experiments, suggesting new source-identifications and explaining the significance of these borrowings in the composition of his work.

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Introduction

Konrad Kyeser of Eichstätt (1366–after 1405) studied law in Prague and, having witnessed the defeat of the crusader army led by Sigismund of Luxembourg, the king of Hungary (later Holy Roman Emperor) at Nicopolis in 1396, he decided to compose a work on military technology and other technologies under the title *Bellifortis*. The contents of this illustrated and immensely popular work range from descriptions of technical wonders and astrological phenomena to alchemical and magical recipes. The numerous illustrations are accompanied by obscure hexametric captions in Latin composed by the author. In addition to the captions, there are several independent passages of text, written in both prose and verse, some of which are borrowings from existing sources. This article focuses on the sources used by Konrad for his expositions on astrology, magical recipes, and various experiments, suggesting new source-identifications and explaining the significance of

textual borrowings in the composition of his work.¹

The *Bellifortis* exists as two distinct authorial versions, one divided into ten chapters and the other into seven chapters. The oldest manuscripts, dated 1402 and 1405, are dedicated to Wenceslaus of Luxembourg and his successor as the king of the Romans, Rupert of the Palatinate, respectively; both manuscripts are divided into ten chapters. Both manuscripts contain a prologue, and the 1405 version includes personal poems at the end, which constitute a kind of epilogue. I refer to these as the older and the revised ten-chapter version, respectively. The revised version, on parchment, appears to have been a more expensive undertaking than the earlier paper manuscript, and it may have been originally meant for Wenceslaus instead of Rupert.² The topics of the chapters are as follows: battle (1), siege engines (2), water technology (3), siege ladders (4), *ars balistaria* (5), defence against siege (6), torches and candles (7), pyrotechnics (8), heating (9), and miscellaneous (10). Other Latin manuscripts of the *Bellifortis* present a different version of the text, divided into seven chapters without a prologue and with fewer recipes. The view of current research is that the seven-chapter version is a later revision of the ten-chapter version.³ The topics of the seven-chapter version are battle (1), siege engines (2), siege ladders (3), defence against siege (4), water technology (5), pyrotechnics (6), and miscellaneous (7).

Later manuscript copies of the *Bellifortis* are numerous and represent further, non-authorial revisions.⁴ For the appraisal of Konrad's authorial work, the most important copies of the *Bellifortis* are two Göttingen manuscripts that feature the ten-chapter versions, dated to 1402 and 1405, and the oldest Vatican and Chantilly copies of the seven-chapter version, dated to c. 1410:

- Göttingen, Niedersächsische Staats- und Universitätsbibliothek, 4^o Cod. Ms. philos. 64a Cim.⁵
- Göttingen, Niedersächsische Staats- und Universitätsbibliothek, 2^o Cod. Ms. philos. 63 Cim.⁶
- Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1994⁷
- Chantilly, Musée Condé, MS 348⁸

¹ The research for this article was conducted with grants from the Jenny and Antti Wihuri Foundation and the Kalevi Kuitunen Foundation.

² The *tentoria fixa* on f. 85^r is adorned with the letter *W*, and the first instance of the name *Ruperto* in the dedication on f. 2^r is written on an erasure. Theresia Berg & Udo Friedrich, 'Wissenstradierung in spätmittelalterlichen Schriften zur Kriegskunst: Der "Bellifortis" des Konrad Kyaser und das anonyme "Feuerwerkbuch"', in Jan-Dirk Müller ed., *Wissen für den Hof. Der spätmittelalterliche Verschriftungsprozess am Beispiel Heidelberg im 15. Jahrhundert* (Münstersche Mittelalter-Schriften 67), München: Wilhelm Fink 1994, 188.

³ Regina Cermann, *Der 'Bellifortis' des Konrad Kyaser* (Codices Manuscripti & Impressi Supplementum 8), Hollinek: Purkersdorf 2013, 16–18.

⁴ For an overview and a provisional *stemma codicum*, see Cermann 2013, 94–98.

⁵ Available as a colour microfiche: Udo Friedrich & Fidel Rädle ed., Konrad Kyaser. *Bellifortis, Feuerwerkbuch. Farbmikrofiche-Edition der Bilderhandschriften Göttingen, Niedersächsische Staats- und Universitätsbibliothek, 2^o Cod. Ms. philos. 64 und 64a Cim.* (Codices figurati – Libri picturati 3), Edition Helga Lengsfelder: München 1995.

⁶ The manuscript will be digitally available at <http://resolver.sub.uni-goettingen.de/purl?PPN1886557055>. Innsbruck, Tiroler Landesmuseum Ferdinandeum, Cod. FB 32.009, dated to c. 1455, is a copy of the Göttingen manuscript and is digitally available at <https://manuscripta.at/diglit/AT3900-FB32009/0001>.

⁷ Digitally available at <https://doi.org/10.11588/diglit.9875>.

⁸ Digitally available at <https://arca.irht.cnrs.fr/ark:/63955/ral9ejg2cfen>.

In this article, these four manuscripts are referred to as Göttingen 64a (the older ten-chapter version), Göttingen 63 (the revised ten-chapter version), Vatican 1994, and Chantilly 348 (both representing the seven-chapter version). Other manuscripts of the *Bellifortis* are referred to as needed.

The multifaceted content of the *Bellifortis* is reflected in the diversity of the existing literature on this work. Since coming to the attention of scholars around the turn of the nineteenth century, the *Bellifortis* has provided material for the study of the history of art,⁹ warfare,¹⁰ chemistry,¹¹ technology,¹² astrology,¹³ and magic.¹⁴ A facsimile (only partially in colour) of Göttingen 63, accompanied by a transcription and a translation, was published by Götz Quarg in 1967, but this edition unfortunately suffers from several incorrect readings, translations, and interpretations.¹⁵ The problems in Quarg's edition are enumerated and discussed in Hermann Heimpel's review, which is indispensable for anyone attempting to make use of Quarg's transcription and translation.¹⁶ Significant studies on the *Bellifortis* have been conducted by Udo Friedrich (et al.), Rainer Leng,

⁹ Alwin Schultz, *Deutsches Leben im XIV. und XV. Jahrhundert*, F. Tempsky: Wien 1892, *passim*; Alfred Stange, *Deutsche Malerei der Gotik. Zweiter Band. Die Zeit von 1350 bis 1400*, Deutscher Kunstverlag: Berlin, 1936, 51–52; Maria Haľaburda, *Fortuna in weltlichen mehrstimmigen Kompositionen des 14. und frühen 15. Jahrhunderts. Eine Untersuchung textlich-musikalischer Sinnbezüge* (Musicological studies & documents 51), Hänsler Verlag: Holzgerlingen 1999, 39.

¹⁰ Max Jähns, *Geschichte der Kriegswissenschaften, I. Abteilung. Altertum, Mittelalter, XV. und XVI. Jahrhundert* (Geschichte der Wissenschaften in Deutschland 21), R. Oldenbourg: München–Leipzig 1889, 248–56; Volker Schmidtchen, *Kriegswesen im späten Mittelalter. Technik, Taktik, Theorie*, VCH, Acta Humaniora: Weinheim 1990; Peter Purton, *The Medieval Military Engineer: From the Roman Empire to the Sixteenth Century* (Armour and Weapons 7), Boydell & Brewer: Woodbridge 2018, 209, 220.

¹¹ S. J. von Romocki, *Geschichte der Explosivstoffe. I. Geschichte der Sprengstoffchemie, der Sprengtechnik und des Torpedowesens bis zum Beginn der neuesten Zeit*, Robert Oppenheim (Gustav Schmidt): Berlin 1895, 133–78; J. R. Partington, *A History of Greek Fire and Gunpowder*, W. Heffer & Sons: Cambridge 1960.

¹² George Sarton, *Introduction to the History of Science Volume III: Science and Learning in the Fourteenth Century, Part II* (Carnegie Institution of Washington Publication 376), Carnegie Institution of Washington: Baltimore 1948, 1550–51; Friedrich Klemm, *Technik: eine Geschichte ihrer Probleme*, Karl Alber: Freiburg–München 1954, 88–91; Friedrich Klemm & Dorothea Waley Singer trans., *A History of Western Technology*, George Allen & Unwin: London 1959, 98–101; Carl Graf von Klinckowstroem, *Knaurs Geschichte der Technik*, Droemersch Verlagsgesellschaft Th. Knauer Nachf.: München–Zürich 1959, 71–74; Clive Hart, *Kites: An Historical Survey*, Frederick A. Prager: New York–Washington 1967, 66–67.

¹³ Anton Hauber, *Planetenkinderbilder und Sternbilder. Zur Geschichte des menschlichen Glaubens und Irrrens* (Studien zur deutschen Kunstgeschichte 194), J. H. Ed. Heitz (Heitz & Mündel): Strassburg 1916; Raymond Klibansky, Erwin Panofsky & Fritz Saxl, *Saturn and Melancholy: Studies in the History of Natural Philosophy, Religion, and Art*, Basic Books: New York, 1964.

¹⁴ William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture*, Princeton University Press: Princeton 1994, 68–71; Richard Kieckhefer, *Magic in the Middle Ages*, Cambridge University Press: Cambridge 2022, 120–24.

¹⁵ Götz Quarg, *Bellifortis. Umschrift und Übersetzung*, VDI-Verlag: Düsseldorf 1967. Earlier substantial publications of the material in Göttingen 63 are Romocki 1895, 133–78; M. Berthelot, 'Histoire des machines de guerre et des arts mécaniques au Moyen Âge', *Annales de Chimie et de Physique* 19 (1900a): 289–420.

¹⁶ Hermann Heimpel, 'Conrad Kyeser aus Eichstätt, Bellifortis. Herausgegeben von der Georg-Agricola-Gesellschaft zur Förderung der Geschichte der Naturwissenschaften und der Technik. VDI Verlag Düsseldorf 1967. 2 (nicht gezählte) Bände in Kassette: 1. (ohne Titelblatt) Facsimile der Handschrift Phil. 63 der Niedersächsischen Staats- und Universitätsbibliothek Göttingen; 2. Umschrift und Übersetzung von Götz Quarg. LIV und 107 S. 480. — DM.', *Göttingische Gelehrte Anzeigen* 223/1–2 (1971), 115–48. It may also be of interest to read Quarg's response to Heimpel's review, entitled 'Eine Nachlese zum Bellifortis. Folgen eines akademischen Blindurtheiles', available online at https://mgh.primo.exlibrisgroup.com/permalink/49MGH_INST/n4cgp5/alma991000567179707216.

and Regina Cermann.¹⁷ Several of Konrad's sources that have since been accepted in research literature were first named by Romocki in his treatment of the *Bellifortis*.¹⁸ These are Vegetius's *Epitoma rei militaris*, Marcus Graecus's *Liber ignium*, Giles of Rome's *De regimine principum*, and Pseudo-Albertus Magnus's *De mirabilibus mundi*. In addition, Romocki identified a reference to a 'valuable alchemical source' entitled *Liber auriferi operis*, a book on gold-making, which is referred to in a recipe found in Göttingen 63. According to Romocki, two of Konrad's recipes come from this alchemical work.¹⁹ Though Romocki's observations about the technical problems the recipes pose are undoubtedly sound, there are certain limitations to his analysis. First, *auriferi* is an improbable reading for the *amicalf* of the manuscript (Quarg's edition has *auricalcarii operis*); Cermann suggests *amicalis* or *amicabilis*.²⁰ Second, the correct title of this unknown work notwithstanding, the reference itself may be part of the text Konrad is quoting. This would not be unprecedented, since the 'Inquid Humaym quidam' ('a certain Ḥunayn says') in Göttingen 64a, f. 85^v is demonstrably part of the text being quoted, as will be discussed further below.²¹ Thus, determining whether Konrad is paraphrasing or simply copying a block of text is of utmost importance. A summary of the research history on the sources of the *Bellifortis* can be found in Cermann's monograph.²²

The following two sections of this article will discuss the most convoluted and complex topics in the *Bellifortis*, namely, astrology and what could be collectively called 'secrets'. The first section will discuss Konrad's source base and how he composed the astrological section found in the first chapter of the *Bellifortis*; the second section investigates the sources that informed Konrad's recipes and experiments, which often invoke the occult properties of animals, plants, and stones.

¹⁷ Berg & Friedrich 1994, 169–232; Friedrich & Rädle 1995; Udo Friedrich, 'Herrscherpflichten und Kriegskunst. Zum intendierten Gebrauch früher 'Bellifortis'-Handschriften', in Christel Meier & Dagmar Hüpper & Hagen Keller eds., *Der Codex im Gebrauch (Akten des Internationalen Kolloquiums 11.–13. Juni 1992)* (Münstersche Mittelalter-Schriften 70), Wilhelm Fink Verlag: München 1996, 197–210; Rainer Leng, *Ars belli. Deutsche taktische und kriegstechnische Bilderhandschriften und Traktata im 15. und 16. Jahrhundert. Band 1 Entstehung und Entwicklung* (Imagines Medii Aevi. Interdisziplinäre Beiträge zur Mittelalterforschung 12/1), Reichert: Wiesbaden 2002, 109–49; Rainer Leng ed., *Katalog der deutschsprachigen illustrierten Handschriften des Mittelalters 39. Feuerwerks- und Kriegsbücher* (Katalog der deutschsprachigen illustrierten Handschriften des Mittelalters 4/2, 3–4), C. H. Beck: München 2009, 203–52; Rainer Leng, 'Selektion und Missverständnisse. Rezeption antiker Kriegstechnik im späten Mittelalter', in Marco Formisano & Hartmut Böhme eds., *War in Words: Transformations of War from Antiquity to Clausewitz*, De Gruyter: Berlin–New York 2011, 333–74; Cermann 2013; Regina Cermann, "'Astantes stolidos sic immutabo stultos" – Von nachlässigen Schreibern und verständigen Buchmalern. Zum Zusammenspiel von Text und Bild in Konrad Kyesers 'Bellifortis'", in Christina Beier and Evelyn Kubina eds., *Wege zum illuminierten Buch. Herstellungsbedingungen für Buchmalerei in Mittelalter und früher Neuzeit*, Böhlau: Wien 2014, 245–70. Cermann's monograph is an indispensable point of departure for engaging with the topic. The most recent article on Konrad in a reference work is Uwe Tresp, 'Kyeser, Konrad', in Wolfgang Achnitz ed., *Das wissensvermittelnde Schrifttum im 15. Jahrhundert* (Deutsches Literatur-Lexikon. Das Mittelalter 7), Walter de Gruyter: Berlin–Boston 2015, 33–39.

¹⁸ Romocki 1895, 133–78.

¹⁹ Romocki 1895, 171–72.

²⁰ Quarg 1967, xvii, 85; Cermann 2013, 28.

²¹ In the first published study of Göttingen 64a, the alleged *Liber auricalcarii operis* was tentatively identified as a lost work by Ḥunayn ibn 'Ishāq (808–873), an Arab scholar and translator, Berg & Friedrich 1994, 205 note 125.

²² Cermann 2013, 11 note 21.

The seven planets and Alexander the Great

The introductory verse of the first chapter opens with the astrological section:

Capitulum primum martis quod tendit ad ymum
per planetarum colores / et almerionem
Currus belligeros / necnon et aspides fortes...²³

‘The first chapter of Mars, which covers everything through the colours of the planets, the *almerio*, war wagons, and strong shields...’

The placement of this section at the beginning of the work may be indicative of Konrad’s intent to assign one of the planets to each of the seven chapters, suggesting the originality of the seven-chapter version. The first chapter of both versions is introduced as ‘capitulum primum Martis’ and the third chapter as ‘trinum ... capitulum mercuriale’, though the topic of the third chapter is different in the two versions (the ten-chapter version has ‘trinum nauale’ etc., the seven chapter-version ‘trinum hoc canale’ etc.).²⁴ Even if such an arrangement was originally intended, Konrad must have abandoned it early on, and its appearance in the later recension by (Pseudo-)Johannes Hartlieb may be considered a coincidence.²⁵

The contents of the astrological section are not the same in the three authorial versions. The illustrations and their associated captions may be divided into three main parts: the seven planets (including the two luminaries, the Sun and the Moon), the four winds, and Alexander the Great. The seven planets each have their own illustration, the four winds have one, and Alexander two, one featuring his lance, *almerio*, and the other its point, *meufaton*. The illustrations of the seven planets are further divided into images of riders who represent the planets, and banners displaying their colours. The occurrences of these illustrations in the revised and older ten-chapter versions (Göttingen 63 and 64a, respectively) and the seven-chapter version (represented by Vatican 1994 and Chantilly 348) are indicated in the table below:

	Göttingen 63	Göttingen 64a	Seven-chapter version
Planetary riders	✓		✓
Planetary banners		✓	✓
The four winds	✓		✓
Alexander the Great (<i>almerio</i> , <i>meufaton</i>)	✓		✓

The four winds appear to have been inspired by Vegetius and fall outside the scope of this article, but they are listed here for the sake of completeness, as they constitute part of the astrological section. In the seven-chapter version, the planets (riders with banners) are followed by Alexander’s

²³ Göttingen 63, f. 4^v; cf. Göttingen 64a, f. 2^r; Vatican 1994, f. 1^v; Chantilly 348, f. 1^r.

²⁴ Göttingen 63, ff. 4^v, 52^r; Göttingen 64a, ff. 2^r, 44^r; Vatican 1994, ff. 1^v, 54^r; Chantilly 348, ff. 1^r, 55^r.

²⁵ The standard order of the planets in Hartlieb’s version does not match the ones suggested by the introductory verses. This new version is represented by Wien, Österreichische Nationalbibliothek, Cod. 3062; Berlin, Staatsbibliothek zu Berlin – Preußischer Kulturbesitz, Ms. germ. qu. 621; Berlin, Deutsches Historisches Museum, Bibliothek, RA 18/414 (*olim* Staatsbibliothek zu Berlin – Preußischer Kulturbesitz, Ms. germ. qu. 2041); and a manuscript now in a private collection in Switzerland (KdiH 39.4.14). Cf. Cermann 2013, 19.

almerio, Alexander's *meufaton*, and the four winds, but in Göttingen 63, the order of the last three is reversed (the four winds, *meufaton*, *almerio*).²⁶ In addition, the illustration and explanation of the trick of reflecting sunlight into an opponent's eyes immediately follow the four winds in the seven-chapter version but are found within the section on siege engines in Göttingen 63.²⁷

The texts related to each of the seven planets found in the three versions can be divided into six component parts. Most of the information they contain is ultimately derived from Ptolemy's *Tetrabiblos* or *Quadripartitum*.²⁸ The first text is the verse, written in the first person, that describes the colours and the domiciles of the planets (e.g., 'Sideris supremi Saturni summum vexillum / sum ... Est michi Saturno domus eglocerontis et vrna'²⁹). This is the only text found in Göttingen 64a, where it is presented as a continuous poem, without being interrupted by the insertion of other texts or illustrations between the strophes.³⁰ In Göttingen 63, these verses are placed under the planetary riders, but in the seven-chapter version, they are simply the first text on the facing page. The second text details the periods of the planets, i.e., the time they take to pass through the Zodiac, and the qualities of their children, i.e., people born or conceived in the hour of their influence (e.g., 'Annis viginti currit bis quinque Saturnus / Et homo qui nascitur dum Saturnus dominatur / Audax vrbanus, malus, antiquus, fur auarus...'³¹). In Göttingen 63, these texts appear as the first text on the facing page (or, in the case of Saturn, the text is found on the recto side of the preceding leaf).³² In the seven-chapter version, these strophes follow the ones on the planetary colours, both being on pages facing the illustrations. The strophes are, in turn, followed by short prose paragraphs detailing the planets' properties (moist or dry, hot or cold) and their exaltations, falls, and domiciles (i.e., the signs that modify the effect of each planet).³³ These paragraphs are not present in Göttingen 63, which provides the same information (excluding the elemental properties) in verse form at the beginning of the section, accompanied by short sentences on the qualities each planet gives

²⁶ Göttingen 63, ff. 11^v–12A^r. The leaf with the four winds and the caption about the first siege engine (f. 12A) is missing and has been replaced with a copy of Innsbruck, Tiroler Landesmuseum Ferdinandeum, Cod. FB 32.009, f. 15, which, in turn, is a copy of Göttingen 63.

²⁷ Vatican 1994, ff. 12^v–13^r; Chantilly 348, ff. 11^v–12^r; Göttingen 63, f. 18^v. This trick is omitted in Göttingen 64a.

²⁸ Greek text: Claudius Ptolemaeus, *Ἀποτελεσματικά*, W. Hübner ed. (Bibliotheca scriptorum Graecorum et Romanorum Teubneriana), B. G. Teubner: Leipzig 1998; *Tetrabiblos*, F. E. Robbins ed. (Loeb Classical Library), Harvard University Press: Cambridge, MA 1940. The first printed edition of the Latin translation from Arabic, attributed to Plato Tiburtinus, is *Liber Quadripartiti Ptolomei id est quattuor tractatum*, printed in Venice in 1484 (ISTC ip01088000), <https://mdz-nbn-resolving.de/details:bsb00060370>.

²⁹ Göttingen 63, f. 6^r.

³⁰ Göttingen 64a, f. 2^v.

³¹ Göttingen 63, f. 5^r. Cf. *Liber Quadripartiti Ptolemei*, 3.11, D7^v–D8^v; 3.13, E2^r–E4^v; 4.3, E7^r–E8^r. The late medieval system of *Planetenkinder* is considerably simpler than the one presented by Ptolemy.

³² See Göttingen 63, f. 5^r. Saturn is depicted on f. 6^r.

³³ Cf. *Liber Quadripartiti Ptolemei*, 1.4, A4^v–A5^r; 1.18, B1^v; 1.20, B2^r–B2^v.

to the soul, ultimately derived from Macrobius.³⁴ These two texts are curiously inserted between the verse on the period and children of Saturn and its illustration.³⁵ For each planet, Göttingen 63 also provides verses that list the body parts (and their associated ailments) ruled by the signs of the Zodiac, in which each planet in question has its domicile.³⁶ These verses are written in circular frames around the depictions of the signs, which are placed above the illustrations of their respective planets, as is common in other astrological works.³⁷

The information provided above is summarised in the table below:

	Göttingen 63	Göttingen 64a	Seven-chapter version
Colours and domiciles	✓	✓	✓
Periods and children	✓		✓
Exaltations, falls (prose)			✓
Exaltations, falls (verse)	✓		
Qualities of the soul	✓		
Signs and body parts	✓		

For simplicity, the table above does not take into account that in Göttingen 63 and the seven-chapter version, the Moon has a stanza that does not fit into the above categorisations (*incipit*: ‘Oculus luna mundi’).³⁸ In addition, Venus has three extra lines following the verse on its period and children, which only occur in Göttingen 63 (*incipit*: ‘Ach venus cur veneras’).³⁹ Further, the verses on the names of the Sun (*incipit*: ‘Sol oritur ortu’) are found with the Sun in Göttingen 63, but in the seven-chapter version, they accompany the caption for the four winds.⁴⁰

³⁴ [Saturnus] dat anime virtutem discernendi et raciocinandi’, [Jupiter] dat magnanimitatem anime’, [Mars] animositatem influit anime’, [Sol] dat anime virtutem memorandi et reminiscendi’, [Venus] dat anime concupiscentiam et desiderium’, [Mercurius] dat anime virtutem gaudendi et delectandi’, [Luna] dat anime virtutem vegetandi que dicitur virtus naturalis animalis’, Göttingen 63, f. 5^v. Cf. ‘In Saturni ratiocinationem et intelligentiam, quod λογιστικόν et θεωρητικόν uocant: in Iouis uim agendi, quod πρακτικόν dicitur: in Martis animositatis ardorem, quod θυμικόν nuncupatur: in Solis sentiendi opinandique naturam, quod αισθητικόν et φανταστικόν appellant: desiderii uero motum, quod επιθυμητικόν uocatur, in Veneris: pronuntiandi et interpretandi quae sentiat, quod έρμηνευτικόν dicitur, in orbe Mercurii: φυτικόν uero, id est naturam plantandi et augendi corpora, in ingressu globi lunaris exercet.’ Macrobius, ‘In somnium Scipionis’, F. Eyssenhardt ed. (Bibliotheca scriptorum Graecorum et Romanorum Teubneriana), B. G. Teubner: Leipzig 1893, I, XII 13–14, 533. See Klibansky et al. 1964, 155–56, 192–93.

³⁵ Göttingen 63, ff. 5^r–6^r.

³⁶ The association of body parts with the signs are not originally from Ptolemy but probably from Alcabitius (Al-Qabīṣī, d. 967), whose work was translated into Latin by John of Seville c. 1130–1140; see Alcabitius, ‘Introductorius ad magisterium iudiciorum astrorum’, C. Burnett & K. Yamamoto & M. Yano eds. (Warburg Institute Studies and Texts 2), The Warburg Institute: London 2004, I [25–36], 245–46.

³⁷ E.g., in the fifteenth-century *Sphaerae coelestis et planetarum descriptio*: Modena, Biblioteca Estense universitaria, α.x.2.14, ff. 5^v–11^v.

³⁸ Göttingen 63, f. 11^r; Vatican 1994, f. 9^r (with an omission of three lines between the two instances of *nocturnum*); Chantilly 348, f. 8^r.

³⁹ Göttingen 63, f. 9^v.

⁴⁰ Göttingen 63, f. 8^v; Vatican 1994, f. 10^r; Chantilly 348, f. 9^r.

The riders and banners are not a common way of depicting the planets and may be Konrad's own creation.⁴¹ It has been suggested that the planetary riders may represent knights dressed up as the seven planets, because in some instances even Venus is represented as a man.⁴² The colours assigned to the planets correspond to the metals associated with each planet, which certainly fits with Konrad's interests.⁴³ It is tempting to speculate that the associated verses that describe the colours and domiciles of the planets could be Konrad's own. There are, however, some parallels to be found. The last lines of Saturn and Venus match the last lines found in an astrological manuscript dated to the second quarter of the fifteenth century:

Est mihi Saturno domus eglocerontis et vrna (Göttingen 63, f. 6^r)
cf. Est tibi saturne domus eglocerontis et vrne⁴⁴

Libram nam cum thauro ego colo purior auro (Göttingen 63, f. 9A^r)
cf. Librum [*sic*] cum thauro venus ambit clarior auro⁴⁵

These parallels are admittedly later than the *Bellifortis*, but considering the other cases discussed below, it seems more likely that Konrad copied from an existing text.⁴⁶ I have not been able to find parallels for the verses describing the colours of the planets, and it is tempting to suggest that an original poem on the planetary banners would have formed the core around which Konrad compiled material from other sources. The lines refer to their associated illustrations in the first person, which

⁴¹ Similar riders are found in Los Angeles, J. Paul Getty Museum, Ms. Ludwig XII 8, ff. 47^r, 47^v, 48^v, 49^r, 50^v, 51^r and the Medieval Housebook of Wolfegg Castle (ff. 10^v–17^v), but they both postdate the *Bellifortis* by a considerable margin. Cf. Klibansky et al. 1964, 296–97. For examples of more typical depictions of the planets, see Salzburg, Universitätsbibliothek, M III 36, ff. 236^r–39^r; Tübingen, Universitätsbibliothek, Md 2, ff. 267^r–72^r; and Köln, Historisches Archiv der Stadt, Best. 7020 (W*) 232, ff. 2^r–8^r (a copy of *Bellifortis*).

⁴² Fritz Saxl, *Verzeichnis astrologischer und mythologischer illustrierter Handschriften des lateinischen Mittelalter in römischen Bibliotheken* (Sitzungsberichte der Heidelberger Akademie der Wissenschaften, Philosophisch-Historische Klasse 1915, 6.7. Abhandlung) Heidelberg 1915, 114. The example provided is Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1888, 113^r (male Venus), but the Moon on f. 115^r appears to be male as well. Other instances: Göttingen 63, f. 10^v (male Moon and perhaps Venus); Colmar, Bibliothèque municipale, Ms. 491. f. 3^r (male Moon); Wien, Österreichische Nationalbibliothek, cod. 5278, ff. 5^v, 7^v (male Venus and Moon); München, Bayerische Staatsbibliothek, cgm 30150, ff. 87^v, 89^v (male Venus and Moon); Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1889, ff. 87^r, 89^r (male Venus and Moon).

⁴³ Sabine Heimann-Seelbach, 'Jan-Dirk Müller (Hrsg.): Wissen für den Hof. Der spätmittelalterliche Verschriftungsprozeß am Beispiel Heidelberg im 15. Jahrhundert (Münstersche Mittelalter-Schriften Band 67). Wilhelm Fink Verlag, München 1994. 407 Seiten [Rezension]', *Göttingische Gelehrte Anzeigen* 248/3–4 (1996), 258–83, at 272 note 26. Slightly different colours are found in Alcabitus, 'Introductorius', II [5], 269; II [10], 272; II [15], 275; II [22], 278; II [28], 281–82; II [33], 284–85; II [38], 288. Here the Sun is transparent (in the Latin translation: 'habet ex coloribus quicquid videtur peregrino colore' or '...dat claritatem', from the Arabic *mā yašiffu* 'that which is transparent'), Venus white, Mercury mixed ('habet omnem colorem commixtum atque variatum', translating *mumtaziğ* 'mixed') or sky-blue (*alezmeniuni*, with various spellings, from *asmānğūnī*), and the Moon yellow.

⁴⁴ 'Your domicile, Saturn, is in Capricorn and Sagittarius.' Salzburg, Universitätsbibliothek, M III 36, f. 236^r.

⁴⁵ 'Venus, brighter than gold, goes around Libra and Taurus.' Salzburg, Universitätsbibliothek, M III 36, f. 238^r.

⁴⁶ When this article was already in press, I found both of these lines in Eberhard of Béthune's *Graecismus* (c. 1212), see Eberhardus Bethuniensis, *Graecismus*, Ioh. Wrobel ed., G. Koebner: Breslau 1887, VII 32–35, 24.

would suggest that they were originally created to accompany the illustrations of the banners.⁴⁷ In the parallels cited above, Konrad would have then edited the borrowed text to match the first-person voice of the preceding lines. In addition to the lack of identified parallels, this hypothesis is further corroborated by the metrical quality of the lines and the fact that Konrad has demonstrably compiled texts by combining lines from previously existing poems, as will be discussed below.

The second group of verses describes the periods and children of each planet. Whereas the previous group is almost exclusively made up of strophes of four lines (only the Moon has five lines, six in the revised ten-chapter version), the strophes of the second group have five to eight lines. The first line (two in the case of the Sun) of each strophe indicates the length of the period of the planet (i.e., the time required for the planet to travel through the Zodiac), the rest describe the mental and physical characteristics of children born under the influence of the planet. In her review of previous scholarship on the *Bellifortis*, Regina Cermann notes that Rainer Leng was the first to identify the *incipit* ('Annis viginti currit bis quinque Saturnus') as Walther I, no 1125a but adds that only the first line of the text referred to by Walther (Frankfurt am Main, Universitätsbibliothek Johann Christian Senckenberg, Ms. Barth. 136, ff. 345^v–346^r) matches that of Göttingen 63, f. 5^r.⁴⁸ This is true, but only because the second line matches the first line of Jupiter's strophe ('Juppiter duodenis in circulo percurrit annis'), the third line the first line of Mars' strophe ('Zodiacum totum / mars binis peruolat annis'), and so on.⁴⁹ Even so, the manuscript cited (a copy of *Vocabularius ex quo*) is dated to the late fifteenth century, so one could argue that the verse added to its margin is in fact derived from the *Bellifortis*. The verse is, however, preserved in two fourteenth-century manuscripts as well.⁵⁰ It appears, therefore, that Konrad has split the mnemonic verse into seven parts and added content for each planet.

The lines that follow the period verses may be referred to by their secondary *incipit*, 'Et homo qui nascitur dum Saturnus dominatur.'⁵¹ This matches Walther I, nos 17938 ('Si quis nascatur, dum Saturnus dominatur'), 17949 ('Si quis tunc nascitur, dum Saturnus dominatur'), and 18115a ('Sic (l. Si?) homo nascitur (l.-atur?) cum Saturnus dominatur').⁵² Versions of this text are found in several manuscripts from the thirteenth century onwards. One version is cited by Walter Burley (c.

⁴⁷ Similar use of the first person is found in the captions of Fiore dei Liberi's *Flos duellatorum* or *Fior di Battaglia* from the early fifteenth century. See Francesco Novati ed., *Flos duellatorum in armis, sine armis, equester, pedester. Il Fior di Battaglia di Maestro Fiore dei Liberi da Premariacco* (Collezione Novati 1), Istituto Italiano d'Arti Grafiche: Bergamo 1902; Massimo Malipiero ed., *Il Fior di battaglia di Fiore dei Liberi da Cividale. Il Codice Ludwig XV 13 del J. Paul Getty Museum*, Ribis 2006. Almost identical illustrations without captions are found following a copy of the *Bellifortis* in Wien, Österreichische Nationalbibliothek, cod. 5278, ff. 174^r–203^r.

⁴⁸ Hans Walther, *Initia carminum ac versuum medii aevi posterioris Latinorum. Alphabetisches Verzeichnis der Versanfänge mittellateinischer Dichtungen* (Carmina medii aevii posterioris Latina I), Vandenhoeck & Ruprecht: Göttingen 1959, 57; Leng 2002, 121 note 564; Cermann 2013, 11 note 21.

⁴⁹ 'Annis viginti currit bis quinque saturnus / Atque duodenis percurrit iupiter annis / Zodiacum totum mars bis [sic] peruolat annis / Tricentis sexagenis ac quinque diebus / Ac horis sex zodiacum sol peruolat omnem / Tricentis bis viginti venus octo diebus / Currit tibi centum bis decem mercurialis / Octo bis decem consurgit luna diebus.' Frankfurt am Main, Universitätsbibliothek Johann Christian Senckenberg, Ms. Barth. 136, ff. 345^v–46^r.

⁵⁰ Alba Iulia, Biblioteca Batthyaneum, MS I 86, f. 135^r; Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1409, f. 59^v.

⁵¹ Göttingen 63, fol. 5^r.

⁵² Walther 1959, 940–41, 950.

1275–1344/5) in his *De planetis et eorum virtute*.⁵³ Another version is found in the Salzburg manuscript cited above, which has a total of twenty-one lines, three for each planet, two of which detail the qualities, with the third line indicating the domiciles, as already discussed above.⁵⁴ A longer version of thirty-two lines ('Versus de complexione planetarum sub eis nascentibus') is found in a theological miscellany dated 1469.⁵⁵ This version corresponds to the text found in the *Bellifortis* except for two additional lines at the end and a total of four lines missing from Jupiter and the Sun.⁵⁶ Most manuscripts have shorter versions of fourteen (two lines per planet) or fifteen (Saturn has three) lines.⁵⁷ Consequently, Konrad appears to record the most complete version of the poem, though spliced together with another poem on the periods of the planets.

It was noted above that the information on the exaltations and falls of the planets given in the prose paragraphs of the seven-chapter version corresponds with that of the verse found in the revised ten-chapter version. For example, below are the verses and the prose paragraph on Saturn:

Ymbriferem saturnus habet / simul et capricornum
Est dolor huic Aries / gloria Libra seni⁵⁸

'Saturn rules both Aquarius and Capricorn. The grief of this old man is Aries, his glory Libra.'

Saturnus frigidus et siccus, specialiter in capricorno et aquario
dolet in ariete et gaudet in libra⁵⁹

'Saturn is cold and dry, especially in Capricorn and Aquarius. He grieves in Aries and rejoices in Libra.'

The prose paragraphs are quite generic, and parallels with other texts could easily be found. In the case of the *Bellifortis*, however, it is noteworthy that the information on the exaltations and falls given in the prose paragraphs appears to be drawn from the verse. This can be demonstrated by errors in content found in both the verse and the prose paragraphs. For Jupiter, both indicate its exaltation as Taurus, even though it should be Cancer.⁶⁰ An identical error (Taurus instead of Cancer) occurs with Mars. Moreover, Konrad appears to have misunderstood the (undeniably

⁵³ London, Lambeth Palace Library, 70, f. 147^v; London, Lambeth Palace Library, 74, f. 8^v.

⁵⁴ E.g., 'Si quis nascatur dum Saturnus dominatur / Audax vrbanus malus antiquus fur avarus / Est tibi saturne domus eglocerontis et vrne', Salzburg, Universitätsbibliothek, M III 36, f. 236^r.

⁵⁵ Klagenfurt, Universitätsbibliothek, Pap.-Hs. 14, ff. 166^v–67^r.

⁵⁶ The last two lines are unrelated to the planets and to each other: 'Stultus in risu exaltat vocem suam' (Ecclus. 21: 23) and 'Et bene si numeres tunc habet milia quinque', which is the latter half of a riddle, cf. Walther I, no 19213 and II, no 31330 (Walther 1959, 1008; Hans Walther, *Proverbia sententiaeque Latinitatis medii aevi. Lateinische Sprichwörter und Sentenzen des Mittelalters in alphabetischer Anordnung, Teil 5: Sim—Z* (Carmina medii aevii posterioris Latina II/5), Vandenhoeck & Ruprecht: Göttingen 1967, 311.

⁵⁷ E.g., Karlsruhe, Badische Landesbibliothek, Cod. Lichtenthal 31, f. 213^r; Frankfurt am Main, Universitätsbibliothek Johann Christian Senckenberg, Ms. Barth. 134, f. 120^v.

⁵⁸ Göttingen 63, f. 5^v. The rubricator has added the gloss *aquarium* over the word *Ymbriferem* [sic].

⁵⁹ Vatican 1994, f. 2^v.

⁶⁰ 'Est Jovis in thauro / gratia / capra malum,' Göttingen 63, f. 5^v; 'sistit in thauro sed malus in capricorno,' Vatican 1994, f. 4^r. Here and in the following, cf. *Liber Quadripartiti Ptolemei*, 1.20, B2^v.

unclear) verse as indicating that the fall of Mars should be Capricorn.⁶¹ Further, the verse does not provide the exaltation of Mercury at all, which has resulted in an incomplete sentence in the prose paragraph, as if to be filled in later with the correct sign (Virgo).⁶²

Given that the metrical form of the verses discussed above (elegiac distich) is unlike the verse found elsewhere in the *Bellifortis*, one could tentatively conclude that Konrad did not compose the verses. More conclusive evidence of the lack of Konrad's authorship, however, lies in the fact that the same couplets (with the correct readings of *Cancro* instead of *Thauro*) are found in a fifteenth-century miscellany of mantic texts.⁶³ Moreover, a fourteenth-century manuscript lost since the early 1930s appears to have included the same couplets as part of a treatise entitled 'De erectionibus sive exaltationibus et depressionibus planetarum in signis et domibus'.⁶⁴ I have not been able to identify the five hexametric lines copied below the poem on the planets (*incipit*: 'Cuncta regunt regulant, rutilantia sydera septem', *explicit*: 'Quorum tu casus sic noscas et erecciones').⁶⁵

Like the couplets discussed above, the verses about the signs and body parts found around the depictions of the Zodiac signs in Göttingen 63 are typical examples of medieval mnemonic poetry. For example, the domiciles of Mars, Aries and Scorpio, are accompanied by the following couplets:

Intestina capud oculus pupilla vel auris
Et facies aries tua sunt cum pestibus horum.

Scorpius testiculos virgamque verenda medullam
Wluam vesicam cum morbis hijs properatis⁶⁶

'Intestines, head, eye, pupil, or ear and face, these and their diseases belong to you, Aries. Scorpio [rules over] testicles, penis, private parts, uterus, vulva, bladder, and the sudden illnesses affecting them.'

Again, on stylistic and metrical grounds, these verses do not appear to be original compositions by Konrad.⁶⁷ Moreover, the verses about the domiciles of Saturn, Aquarius and Capricorn, are

⁶¹ 'In thauro capra / debiliore cadit,' Göttingen 63, f. 5^v; 'expugnat in thauro et cadit in capricorno,' Vatican 1994, f. 5^r. In the former, the subject is Mars, which 'falls in Taurus (correct: Cancer), who is weaker than Capricorn'. This reading yields the correct interpretation. Curiously enough, the same reversal of signs can be found in Albert of Stade's *Troilus*: 'Mars tibi cancer honor, sed capricornus onus', Albertus Stadensis, *Troilus*, Th. Merzdorf ed. B. G. Teubner: Leipzig 1875, V 178, 137.

⁶² 'Occidit in pisces / regula vera docet,' Göttingen 63, f. 5^v; 'debilitatur in piscibus sed erigitur in...,' Vatican 1994, f. 8^r. Cf. 'Virgine Mercurius laetatur et in geminorum / Imperat hospitio, piscibus exul erit', Albertus Stadensis, *Troilus*, V 175–176, 137. The confusion may arise because Virgo is both the domicile and the exaltation of Mercury.

⁶³ Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1456, f. 23^v.

⁶⁴ Pisa, Biblioteca Cateriniana del Seminario, 63, ff. 76^r–77^v. See the description in Camillo Vitelli, 'Index codicum latinorum qui Pisis in bybliothecis Conventus S. Catherinae et Universitatis adservantur', *Studi italiani di filologia classica* 8 (1900), 321–427, 365. The codex was reported as missing in 1936, A. Mancini, 'Comunicazioni appunti su maestro Bono da Lucca', *Bollettino storico lucchese* 8 (1936), 31–42, 38 note 1. This work is also found in Lucca, Biblioteca Capitolare Feliniana, Martini 172, ff. 10^r–11^v (third quarter of the fourteenth century), which I have not examined. In Klibansky et al. 1964, 192, the verse of Göttingen 63 is referred to as a 'Latin poem on the planets, of purely literary inspiration, which is found in many late manuscripts,' without any references.

⁶⁵ Göttingen 64, f. 5^v.

⁶⁶ Göttingen 63, f. 8^r. The manuscript reads *piscibus* instead of *pestibus*.

⁶⁷ Cf. Quarg 1967, 10, where Konrad is assumed to be the author.

arranged in the wrong order, as if their content was not understood correctly. Aquarius is on the left side of the page, accompanied by the following, partially fragmentary verse (in the manuscript, line breaks are indicated by capital letters and red ink):

tenet Vrna
 Ac neruos seu que pallor nigredine tingit
 Lungas abscisum fractum veneraque dolentem⁶⁸

On the right, Capricorn has the following line, incomplete both grammatically and metrically:

Capra genu neruos crus inferius

This curious division and reading order has been retained in research literature, along with the reading of the accusative *urnas* or *urnam* instead of the nominative *Vrna*, interpreted as referring to the water-pot held (*tenet*) by Aquarius.⁶⁹ In this case, however, *Vrna* metonymically refers to Aquarius and should be understood as the subject of the sentence.⁷⁰ Thus, the fragmentary verse on Capricorn must precede the verse on Aquarius, yielding a metrically complete and grammatically correct elliptical sentence, which correctly assigns the lower leg to Aquarius, not Capricorn: ‘Capra genu neruos crus inferius tenet Vrna’ (‘Capricorn has the knee and its tendons, Aquarius the lower leg’).⁷¹ Based on these observations, one can conclude that the verses on the signs are copied from an as-of-yet-unidentified source.

Finally, at the end of the astrological section, there is an image of Alexander the Great on horseback, carrying a lance with a green banner.⁷² Romocki notes that the illustration is reminiscent of ‘Oriental models’, citing the ‘Leiden war book’ and Ḥasan al-Rammāḥ (d. 1295), an Arab alchemist who wrote about explosives and gunpowder.⁷³ The ‘Leiden war book’ is a medieval Arabic treatise on warfare ascribed to Iskandar Dū-l-Qarnayn, i.e., Alexander the Great, but no comparable illustration is to be found in either of the manuscript copies.⁷⁴ Another medieval Arabic manuscript includes illustrations of lancers on horseback, but they serve to illustrate the technique of military

⁶⁸ Göttingen 63, f. 6^r.

⁶⁹ Hauber 1916, 55 (with *urnas*); Quarg 1967, 10 (with *urnam*), followed by Halaburda 1999, 44.

⁷⁰ Cf. the verse at the bottom of the very same page, ‘Est michi saturno / domus eglocerontis et vrna’ (‘I, Saturn, have my domicile in Capricorn and Aquarius’). Cf. DMLBS s.v. ‘urna’ 2.

⁷¹ Cf. Alcabitius, ‘Introductorius’, I [34–35], 245–46: ‘Capricornus ... habens ex corpore hominis genua’ ... ‘Aquarius habet ex corpore hominis crura usque ad inferiora cavillarum’. Cf. also Nürnberg, Germanisches Nationalmuseum, Hs 42296, f. 13^r: ‘Aquarius habet crura vsque ad inferiora camillorum [sic] calcanei et neruos aut infirmitates eorum et ijliorum que est contractura membrorum cum pallore vel magnitudine quam volgus connotet emanatio febrilis coloram nigram et torsiones cum doloribus venarum.’

⁷² Göttingen 63, f. 12^r; Vatican 1994, f. 11^r; Chantilly 348, f. 10^r. The illustration of Alexander the Great and his lance is omitted in Göttingen 64a.

⁷³ Romocki 1895, 28–29, 68–74, 136.

⁷⁴ Leiden, Universiteitsbibliotheek, Or. 92 (unillustrated) and 499 (technical illustrations on ff. 74^v–87^r), <http://hdl.handle.net/1887.1/item:3366534> and <http://hdl.handle.net/1887.1/item:2314992>. Dū-l-Qarnayn is the name of a character who appears in the Qur’an (18: 83–101) and has been traditionally identified as Alexander the Great. Romocki’s information is from Reinaud, ‘De l’art militaire chez les Arabes au Moyen Âge’, *Journal asiatique* 12 (1848), 193–237, 198–99; Reinaud & Favé, ‘Du feu grégeois, des feux de guerre, et des origines de la poudre a canon chez les arabes, les persans et les chinois’, *Journal asiatique* 14 (1849), 257–327, 262–82. Cf. Partington 1960, 198–204.

equitation and, as such, are not related to the depiction of Alexander the Great in the *Bellifortis*.⁷⁵ The caption reads as follows:

Allexandri regis / almerio cunctos cohercet
 Atque sternit hostes / quotquot secuntur eum
 Summus philosophus / magno Regi tradidit illum
 Per quem vicit orbem / per quem regnavit in orbe
 Iupiter egregius / stellarum dux, regit illum
 Viridis coloris / noscas hoc esse vexillum⁷⁶

‘The *almerio* of King Alexander compels and cuts down all enemies, however many are after him. The greatest Philosopher gave it to the great king, and with it he conquered the world and reigned over the world. The illustrious Jupiter, leader of the stars, rules over him: as you see, the colour of his banner is green.’

The adjacent illustration features the point of the *almerio*, with the inscription ‘Meufaton’ and a magical seal.⁷⁷ In Göttingen 63, this illustration precedes that of Alexander on horseback, but in the seven-chapter version, it comes after, which arguably makes more sense, as its caption provides additional information about Alexander’s *almerio*. The lines found in the seven-chapter version omitted in Göttingen 63 are included in angular brackets:

Almerionis ferrum istud meufaton dictum
 Fiat ut in forma / fugat hostes atque tyrannos
 (Sagitta cum piscibus luna crescente reformant)
 In vola manus dextre si tu conscripseris ipse
 Tempore quo tuos / videris palam inimicos
 Cultellum gladium / secrete tangas eisdem
 Et fugient statim / sic uictor uinces eos
 (Et hoc secretum secretorum non reuelandum)⁷⁸

‘The point of the *almerio*, which is called *meufaton*, should be made like the image; it drives away the enemy and tyrants. (Sagittarius and Pisces reform [?] while the Moon is waxing.) If you inscribe it yourself in the palm of your right hand when you openly see your enemies and secretly touch their knives or swords, they will immediately flee. You will thus, as a victor, vanquish them. (And this secret of secrets must not be revealed.)’

⁷⁵ Paris, Bibliothèque nationale de France, ms. ar. 2826, ff. 83^r–97^r, <https://gallica.bnf.fr/ark:/12148/btv1b84061735>. Romocki also notes (136 note 5) that the illustration of Alexander in Göttingen 63, f. 12^r is just like the illustration featuring the *draco volans* (a kind of kite) on f. 105^r of the same manuscript.

⁷⁶ Göttingen 63, f. 12^r; cf. Vatican 1994, f. 10^v; Chantilly 348, f. 9^v.

⁷⁷ Göttingen 63, f. 11^v; Vatican 1994, f. 12^r; Chantilly 348, f. 11^r.

⁷⁸ Göttingen 63, f. 11^v; cf. Vatican 1994, f. 11^v; Chantilly 348, f. 10^v (‘Sagitta dum piscibus luna crescentis reformant’). Sagittarius and Pisces are Jupiter’s domiciles. Despite the last line, these instructions do not appear to have any particular connection with the pseudo-Aristotelian *Secretum secretorum*. A similar apparent reference to the *Secretum philosophorum* may be found in connection with a recipe for poisoning the wine supply of an opposing army: ‘Est hoc secretum maximum scias philosophorum’, Göttingen 63, f. 86^v.

Meufaton appears to be a combination of two angelic names of Jewish origin, *Metatron* and *Mefathiel*.⁷⁹ The origin of *almerio* is less clear. In Vatican 1994, the introductory verse of the first chapter is followed by a paragraph, which appears to be made up of glosses that have been copied as if they were part of the main text:

Ad ymum i.e. ad finem martis belli et preliorum. Almerion alio nomine dictus pesagus est figura dimidij equi alati cassidiati in capite et lanceam habentis in thorace.

‘*Ad ymum*, i.e., to the end, *martis*, of war and battle. *Almerion* is called by another name *pesagus* [*sic*], it is an image of a half horse with wings, a helmet on its head, and a lance in its breastplate.’

The winged half horse known as ‘Pesagus’ is clearly a reference to the constellation Pegasus, which is depicted as a half horse.⁸⁰ The helmet and the lance are more difficult to account for. In any case, this explanation is clearly at odds with the two captions cited above, since the referent of *almerio* is not exactly a horse but a lance with a banner. Incidentally, medieval astronomy also included a constellation called *vexillum* (banner), depicted as a lance with a banner.

The constellation Vexillum is found in astronomical works from Michael Scot (c. 1175 – c. 1235) onwards. It owes its origin to Abū Ma‘šar al-Balḥī’s (787–886) *Kitāb al-mudḥal al-kabīr*, in which Ptolemy’s *ἐφαιπίς* (‘cloak’), a part of Sagittarius, is referred to as ‘ṭaraf du’ābat ar-rāmi alladī yusammā ṭ-tarrāda’ (‘the end of Sagittarius’s headband, which is called banner/lance’), rendered as ‘summitas denaal [?] sagittarii que uocatur althitada .i. vexillum’ in John of Seville’s Latin translation.⁸¹ Apparently confused about where exactly the constellation Vexillum is to be found, Michael Scot writes: ‘alij uolunt quod sit eius asta firmata in ore equi secundi qui est semper locatus inter leonem et uirginem’⁸² (‘others think that its lance is fixed in the mouth of the second horse, which is always found between Leo and Virgo’). ‘Second horse’ can be found in astronomical literature as the name of two distinct constellations, a winged horse in the southern hemisphere and a regular horse in the northern hemisphere.⁸³ However, Ptolemy’s Pegasus (*ἵππος* ‘horse’) is translated as *al-faras at-tānai* ‘second horse’ in al-Ḥaḡḡāḡ’s Arabic version and as *equus secundus* in the Latin translation of Gerhard of Cremona; the first horse, *al-faras al-awwal* or *equus prior*, is Ptolemy’s *ἵππου προτομή* (‘horse’s front part [i.e., head]’), the modern Equuleus.⁸⁴

⁷⁹ Jean-Patrice Boudet, *Entre science et nigromance: Astrologie, divination et magie dans l’Occident médiéval (xiiiè–xve siècle)* (Histoire ancienne et médiévale 83), Publications de la Sorbonne: Paris 2006, 361 note 39; Gustav Davidson, *A Dictionary of Angels Including the Fallen Angels*, Free Press: New York 1967, 187, 192–93. As noted by Boudet, the name *Mefaton* occurs in the *Clavicula Salomonis*, see Paris, Bibliothèque nationale de France, ms. it. 1524, f. 199r.

⁸⁰ E.g., Oxford, Bodleian Library, MS. Marsh 144, p. 156; München, Bayerische Staatsbibliothek, Clm 10268, f. 81v.

⁸¹ München, Bayerische Staatsbibliothek, Clm 374, f. 47v (col. 2, l. 9); Franz Boll, *Sphaera. Neue griechische Texte und Untersuchungen zur Geschichte der Sternbilde*, B. G. Teubner: Leipzig 1903, 448; Paul Kunitzsch, *Der Almagest. Die Syntaxis Mathematica des Claudius Ptolemäus in arabisch-lateinischer Überlieferung*, Otto Harrassowitz: Wiesbaden 1974, 295–96. The end of the headband could also be translated as the tip of the fringe. Cf. *Arabic and Latin Glossary*, s.v. ‘قب اؤد’ du’āba’, <https://algloss.de/dariah.eu/>.

⁸² München, Bayerische Staatsbibliothek, Clm 10268, f. 84v.

⁸³ Without wings: Oxford, Bodleian Library, MS. Marsh 144, p. 171; with wings: München, Bayerische Staatsbibliothek, Clm 10268, f. 83v.

⁸⁴ Kunitzsch 1974, 186–87.

Considering the above, Michael Scot suggests a tentative connection between Pegasus, which is referred to in the gloss of Vatican 1994, and Vexillum, which is closer to what an *almerio*, a cavalry lance, actually is. Moreover, the ‘lance in Pegasus’s mouth’ related by Michael Scot is indeed somewhat similar to the ‘winged half horse having a lance in its breastplate’ of the *Bellifortis* gloss. Since Alexander’s *almerio* is depicted with stars,⁸⁵ it seems plausible that Konrad had intended to connect the constellation Vexillum with Alexander the Great, perhaps inspired by Michael Scot’s statement that those born under its influence are destined for successful military leadership and riches.⁸⁶ Unfortunately, no Arabic name for any of the relevant constellations or individual stars appears to provide a plausible etymon for *almerio(n)*.⁸⁷

Even if no unambiguous explanation can be provided, a note on the semantics of Konrad’s *almerio* may be added. It was already mentioned that Göttingen 64a has the banners and no riders, Göttingen 63 has riders but no banners, and the seven-chapter version has both banners and riders. All versions, however, include the verse that explicitly refers to the banners, which makes little sense in Göttingen 63. In all versions, the introductory verse refers to ‘the colours of the planets and the *almerio*’, apparently distinguishing between the colours (banners) of the planets and Alexander’s *almerio*. The prologue in Göttingen 64a, however, omits the illustration of Alexander the Great and, consequently, has no *almerio*, even though it is mentioned in the introductory verse. Moreover, the prologue of Göttingen 64a, in what amounts to a prose paraphrase of the introductory verse, refers to ‘planetarum almeriones, currus belligeros necnon et fortes aspides’⁸⁸ (‘the *almeriones* of the planets, war wagons, and strong shields’). Within Göttingen 64a, the only things this can refer to are the banners of the planets, *almeriones* apparently replacing the *colores* in the verse. This would suggest that the sense of *almerio* is ‘lance’ or ‘banner’, the reference being to the combination of the two as seen in all versions, either as a stand-alone image or wielded by the riders representing the planets or by Alexander the Great. Why Konrad would vacillate between the narrow sense (name of Alexander’s lance with banner) and the wider sense (generic lance and banner), can only be speculated about. The actual etymology of the word and its literary model likewise remain opaque.

Recipes and Experiments

An issue slightly more straightforward than Konrad’s astrological assemblages are the sources for the magical or alchemical recipes and experiments found in chapters seven and eight of the ten-chapter version. Finding parallel texts, however, is complicated by several factors. First, though the best-known works that could potentially include such material are edited and relatively accessible, a vast amount of lesser-known, unedited material has yet to be digitised; digitised catalogues that enable searches may or may not include enough text citations for positive identification.

⁸⁵ There appears to be no connection with the number of stars in Vexillum. There are eight in Vatican 1994, f. 11^r and five in Chantilly 348, f. 10^r; Göttingen 63, f. 12^r has fourteen stars visible, but since the banner is twisted, the exact number is probably not meant to be significant.

⁸⁶ ‘Natus sub isto signo erit alti cordis et prius quam moriatur erit capitaneus castelli uel belli etc. timebitur in populo et honorabitur multum et plus erit diues quam pauper.’ München, Bayerische Staatsbibliothek, Clm 10268, f. 84^v.

⁸⁷ The Arabic word for banner, *‘alam*, remains a tempting candidate.

⁸⁸ Göttingen 64a, f. 2^r.

Second, recipes and other technical texts were typically not copied with the same level of accuracy as literary texts, since the copyist was probably more interested in the information content than the literary form. This makes it more difficult to compare different instances of the same recipe on a purely textual level. Third, there is considerable overlap in the contents of the various named works, due to their compilers having drawn material from previously existing works. Accordingly, if parallel texts exist in several different collections, how can one determine which was used by the compiler of the present work?

The issues listed above may be exemplified by comparing a passage from the *Bellifortis* with parallel texts from other works. Below is the first half of a caption to an illustration which, in Göttingen 63, shows two distressed people exiting a castle with smoke coming out of the door:⁸⁹

Magnes lapis tritus / et bene puluerisatus
 In focum missus / repositus angulis domus;
 Fumus ascendens / expellit queque notato⁹⁰

‘A lodestone is ground and well powdered, thrown in the fireplace, and placed in the corners of a house; the rising fumes drive out (everyone).’

The ‘queque notato’ (‘note everything’) of the ten-chapter version is as strange in this context as the ‘aspida bina’ of the seven-chapter version, for which late medieval German translations have ‘alles gewurm’ (‘all the vermin’),⁹¹ but the sense appears to be that the fumes ascending from heated lodestone powder can be used to drive people out of buildings. Such usage of lodestone is not found in Pliny’s *Historia naturalis* or Theophrastus’s *De lapidibus*, but Damigeron’s *De lapidibus*, from the second century, provides the following information on *magnes*:

praeterea cum voluerint intimi — id est fures — secreta pretiosa diripere, intrant in alicuius domum; deinde inter quattuor angulos domus vel triclinii carbones ardentes ponunt, vel ignem ex bitumine, et superponunt minutatim praecisum lapidem. et sic transferunt mentes et oculos eorum qui adsunt, ut timorem continentes fugiant inde, putantes ruere domum.⁹²

⁸⁹ Göttingen 63, f. 113^r. The illustration in Göttingen 64a, f. 117^v is similar but without the people, and the seven-chapter version curiously has no smoke but two men in the castle blowing trumpets: Vatican 1994, f. 69^v; Chantilly 348, f. 69^v.

⁹⁰ Göttingen 63, f. 113^r; cf. Göttingen 64a, f. 117^v; Vatican 1994, f. 70^r; Chantilly 348, f. 70^r.

⁹¹ ‘Der stain magnes gestosen vnd gebuluert vnd In fur geleit In die winckel des houses vertribt alles gewurm’, Colmar, Bibliothèque municipale, Ms. 491, f. 33^v; cf. Göttingen, SUB, 2^o Cod. Ms. philos. 64 Cim., f. 26^r; Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1889, f. 25^r. *Gewürm* ‘vermin’ may be understood in both the literal sense and the metaphorical sense of referring to riffraff, *Frühneuhochdeutsches Wörterbuch* s. v. ‘gewürm’, <https://fwb-online.de/lemma/gewürm.s.2n>.

⁹² Damigeron, *De lapidibus*, Kai Brodersen ed., Marixverlag: Wiesbaden 2018, 30.180–19, 80. A version of this passage may be found among the chapters appended to Pseudo-Aristotle’s lapidary (as chapter 52) in Montpellier, Bibliothèque interuniversitaire, Section Médecine, H 277, f. 132^r: ‘Fures uero, cum uolunt preciosa diffundere, intrant domum, et inter quatuor domus angulos carbones ardentes ponunt, tunc mittunt lapidem minute precissum, et sic transuertunt mentem, et oculos eorum qui adsunt, ut timore fugiant, putantes ruere domum.’ These chapters have been identified as Pseudo-Dioscorides in Valentin Rose, ‘Aristoteles *De lapidibus* und Arnoldus Saxo’, *Zeitschrift für deutsches Alterthum* 18 (1875), 321–454, 326 but they are in fact from Damigeron; see John M. Riddle, *Marbode of Rennes’ (1035–1123) De Lapidibus Considered as a Medical Treatise* (Sudhoffs Archiv, Beiheft 20), Franz Steiner Verlag: Wiesbaden 1977, 14.

‘When the most secretive people, i.e., thieves, want to steal hidden treasures, they enter somebody’s house. Then they place burning coal or fire of pitch between the four corners of the house or in the dining room and put a very small piece of this stone on top. In this way, they change the minds and eyes of those who are present, so that they flee full of fear, thinking that the house is collapsing.’

Based on the above, Marbode of Rennes (1035–1123) composed the following verse in his *De lapidibus*, which is extant in over a hundred manuscript copies:

Si fur claustra domus spoliis gazisque refertae,
 Ingrediens, prunas ardentis per loca ponat,
 Et superaspergat magnetis fragmina prunis;
 Ut per tetragonum fumi calor alta vaporet.
 Mentibus eversis, velut impendente ruina,
 Diffugient omnes in ea quicumque manebant,
 Et fur securus rapiet quaecumque libebit.⁹³

More or less the same information found its way to Albertus Magnus’s *Mineralia*:

Dicunt etiam quod fures in domum intrantes positis carbonibus in quatuor angulis domus, lapidem hunc contritum superspergunt: et tunc dormientes in domo ita phantasmatis tenentur, quod fugientes aedes relinquunt: et tunc fures furantur quid volunt.⁹⁴

‘They say also that thieves entering a house place burning coals in the four corners of the house and sprinkle upon them the powder of this stone; and then those who are sleeping in the house are so possessed by nightmares that they rush out and leave the building. And then the thieves steal whatever they want.’⁹⁵

An abbreviated version of the above may be found in Pseudo-Albertus Magnus’s *De virtutibus herbarum, lapidum et animalium*:

Ad hoc autem si lapis iste ponatur super carbones in quatuor angulis domus, dico, tritus, & super carbones sparsus, dormientes fugient aedes & relinquunt totum, & tunc possunt fures respicere totum quod volunt.⁹⁶

⁹³ Marbode of Rennes, *De lapidibus*, xix, ll. 300–305 (Riddle 1977, 58); cf. Marbodius, *Liber de gemmis*, J. J. Bourassé ed. (Patrologia Latina 171), Migne: Paris 1854, xix, 1746–47. The third line, which is necessary to complete the sense, is missing from Riddle’s edition and is supplied here from PL. A prose rendition may be found in Montpellier, Bibliothèque interuniversitaire, Section Médecine, H 277, f. 115r: ‘Si fur uoluerit furari quando ingressus fuerit domum, accipiat prunas ardentis, et ponat per plura loca, et super aspergat fragmina magnetis, ut fumus eat fumum domus, omnes qui erunt in domo, fugient extra, ita euerterent mentes eorum, tunc latro secure poterit furari.’

⁹⁴ Albertus Magnus, *Mineralium libri quinque*, A. Borgnet ed. (B. Alberti Magni opera omnia 5), Vivès: Paris 1890, ii, ii, xi, 41.

⁹⁵ Translation from Dorothy Wyckoff, *Albertus Magnus: Book on Minerals*, Clarendon Press: Oxford 1967, 104.

⁹⁶ *Alberti Magni de secretis mulierum libellus, scholiis auctus, & à mendis repurgatus. Ejusdem de virtutibus herbarum, lapidum, & animalium quorundam libellus. Item de mirabilibus mundi, ac de quibusdam effectibus causatis à quibusdam animalibus, &c.* Amstelodami 1740, 132.

‘Moreover, if this stone be put, brayed and scattered, upon coals in the four corners of a house, those sleeping will flee the house and leave all, and then the thieves can steal everything they want.’⁹⁷

Unlike all the texts cited above, Konrad makes no mention of burglary being the purpose of this operation. Indeed, in the context of his *oeuvre*, one would expect this stratagem to have something to do with siege warfare rather than burglary. In any case, though it is a relatively simple matter to chronicle the textual history of this method of clearing a building, determining which exact source Konrad used is not as straightforward, as there are no details in the possible exemplars that would demonstrate a definite connection to Konrad’s text. Konrad makes explicit that *puluerisatus* (powdered) lodestone is used, which appears to be a continuation of Albertus Magnus’s *contritus* (ground), Marbode’s sprinkling of *fragmina*, and Damigeron’s *minuatim praecisus lapis*, which would appear to refer to a single small piece of lodestone. Further, like the *De virtutibus herbarum, lapidum et animalium*, Konrad makes no mention of the visions or nightmares that cause the people to flee. In fact, based on the *Bellifortis* alone, one could infer that the operation creates the impression that the house is on fire. It must also be noted that Konrad’s text has been modified to fit into his peculiar verse form, so similarity in the general level of detail is not necessarily a conclusive argument. If the text can be found in the same work Konrad demonstrably copied from in other instances, the simplest solution would be to attribute his technical knowledge regarding lodestone to the same source. This reasoning could conceivably be extended to include works that share transmission with a work Konrad is known to have cited. Accordingly, if Konrad indeed drew from Pseudo-Albertus Magnus’s *De mirabilibus mundi*, it would be tempting to suggest the *De virtutibus herbarum, lapidum et animalium* as the most likely proximal source. This reasoning, however, runs into two problems. First, even though both works, the *De virtutibus* and the *De mirabilibus mundi*, often occur together in later printed editions, there are very few manuscripts that contain both.⁹⁸ Second, it relies on the assumption that Konrad used the *De mirabilibus mundi*, which will be challenged in the following discussion.

Similarities between the ‘magical lights’ described in chapter 7 of Göttingen 63 and the *De mirabilibus mundi* were already noted by Romocki.⁹⁹ In his edition, Quarg goes further by noting the individual passages of the *Bellifortis* that he identifies as being drawn from the *De mirabilibus mundi*.¹⁰⁰ Unfortunately, he does not provide references to any manuscript or printed edition of the work. In Quarg’s transcript, the two recipes on f. 90^v (of Göttingen 63) bear the title ‘Auszug aus “DE MIRABILIBUS MUNDI”’, but there is also a note with the same information, which could be taken to refer only to the first of the two recipes on that page. Incidentally, neither of the recipes are found in the said work. The same can be said of the two recipes for candles on f. 91^v, which are similarly identified in a note

⁹⁷ A sixteenth-century English translation of (Pseudo-)Albert’s *Book of Secrets* (from which the translation is taken in a slightly edited form) leaves out the last part detailing the criminal purpose of the operation, Michael R. Best & Frank H. Brightman eds., *The Book of Secrets of Albertus Magnus of the Virtues of Herbs, Stones and Certain Beasts, Also a Book of the Marvels of the World* (Studies in Tudor and Stuart Literature), Clarendon Press: Oxford 1973, xx.

⁹⁸ Antonella Sannino, ed., *Il “De mirabilibus mundi” tra tradizione magica e filosofia naturale* (Micrologus’ Library 41), Sismel, edizioni del Galluzzo: Firenze, 2011, 6–7, 83.

⁹⁹ Romocki 1895, 148.

¹⁰⁰ Quarg 1967, xvi, 56–59, 63–64, 66.

as an excerpt from the *De mirabilibus mundi*.¹⁰¹ Similar notes accompany the five recipes on f. 93^v and the eleven recipes on f. 95^r, but in these cases, all recipes except the first one, on f. 93^v, may indeed be found in the work.¹⁰² Finally, Quarg correctly identifies the first recipe on f. 96^r but misidentifies the first one on f. 97^r.¹⁰³ In later research, Konrad's use of the *De mirabilibus mundi* appears to have been generally accepted, though Regina Cermann has expressed some doubts.¹⁰⁴ These doubts are related to the issues of intertextuality and overlapping content discussed above.

The *De mirabilibus mundi* is a particularly instructive case of the problems of identifying sources. This anonymous work is based on a Latin translation of *Risāla fī l-Ḥawāṣṣ* by Ibn al-Ġazzār, merged with the Latin translation of *Kitāb an-Nawāmīs*.¹⁰⁵ The latter, presented as a translation of Galen's commentary of Plato's *Laws* by Ḥunayn ibn 'Ishāq, is known by the titles *Liber anequemis*, *Liber activarum institutionum*, and *Liber vaccae*. Since both the *De mirabilibus mundi* and the *Liber vaccae* consequently contain identical content, it is not always a simple matter to determine whether an individual passage is from one or the other. To address this problem, the following table presents the relevant texts from the seventh chapter of the *Bellifortis* (Göttingen 63) with identified parallels in the *Liber vaccae* (*Liber anequemis*) and the *De mirabilibus mundi*. For the *Bellifortis*, folio numbers and a short incipit are provided. For the *Liber vaccae*, the book and chapter numbers given match the division into chapters in Paolo Scopelliti and Abdessattar Chaouech's transcription (I and II stand for the *Liber anequemis maior* and *minor*, respectively).¹⁰⁶ The *De mirabilibus mundi* is referred to according to the page numbers of Antonella Sannino's critical edition; the second number indicates the paragraph on that page.¹⁰⁷

¹⁰¹ Quarg 1967, 56–58.

¹⁰² Quarg 1967, 59, 63.

¹⁰³ Quarg 1967, 63–66. As before, the reference could be understood as intended to cover the whole page.

¹⁰⁴ 'Kyeser's main authority on magic, it turns out, was not some obscure Arabic treatise on the occult sciences but a popular Latin book of secrets spuriously attributed to Albertus Magnus.' Eamon 1994, 71; Berg & Friedrich 1994, 196, 203, 205; Friedrich & Rädle 1995, 19, 29 note 28; Boudet 2006, 414; Cermann 2013, 7 note 12, 79, 89 note 437.

¹⁰⁵ Fabian Käs, *Die Risāla fī l-Ḥawāṣṣ des Ibn al-Ġazzār: die arabische Vorlage des Albertus Magnus zugeschriebenen Traktats De mirabilibus mundi* (Abhandlungen für die Kunde des Morgenlandes 79), Deutsche Morgenländische Gesellschaft: Wiesbaden 2012, 9–16, 18–22.

¹⁰⁶ Paolo Scopelliti & Abdessattar Chaouech eds., *Liber Anequemis, Liber Astutas. Due 'ricettari neri' di alchimia e magia* (Abraxas Ermetica 6), Mimesis: Milano–Udine 2018. The transcription is based on Firenze, Biblioteca Nazionale Centrale II.III.214, ff. 57^v–72^r. Regarding the transcription, I quote Sophie Page: 'This Latin edition has many errors and queries that are easily resolved with reference to other copies, and the authors offer an unconvincing interpretation of the alchemical significance of the text. Nonetheless, it is useful to have a published transcription of a Latin copy of the *Liber vaccae* and the Arabic fragment, and the authors provide a valuable glossary of ingredients mentioned in the text.' Sophie Page, *Magic in the Cloister: Pious Motives, Illicit Interests, and Occult Approaches to the Medieval Universe* (Magic in History), Pennsylvania State University Press: Pennsylvania 2013, 180 note 11. The chapter numbers of Scopelliti and Chaouech differ slightly from those of David Pingree's unfinished edition, for which see David Pingree, 'Artificial Demons and Miracles', in Pierfrancesco Callieri ed., *Démons et Merveilles d'Orient* (Res Orientales 13), Groupe pour l'Étude de la Civilisation du Moyen-Orient: Bures-sur-Yvette 2001, 109–22, at 110 note 12. Cf. Page 2013, 181 note 14. Pingree's lead manuscript was Montpellier, Bibliothèque interuniversitaire, Section Médecine, H 277, ff. 68^v–78^v.

¹⁰⁷ Sannino 2011.

<i>Bellifortis</i> (Göttingen 63)	<i>Liber vaccae</i>	<i>De mirabilibus mundi</i>
f. 90 ^v , ‘Accipe ex aliera’	I 35, 86	
f. 90 ^v , ‘Accipe ex ere calconis’	I 34, 85–86	
f. 93 ^v , ‘Accipe aliera’	I 36, 86	
f. 93 ^v , ‘Cum vis accendere’	II 10, 94–95	137, 1
f. 93 ^v , ‘Et inter cuius manus’	II 11, 95	137, 2
f. 93 ^v , ‘Operacio lampadis’	II 12, 95	138, 1
f. 93 ^v , ‘Illud cum accenderis’	II 13, 95	138, 2
f. 95 ^r , ‘Illud cum incenderis’	II 9, 94	136, 2
f. 95 ^r , ‘Aliter accipe lampadem’	II 14, 96	
f. 95 ^r , ‘Illud cum in ede incenderis’	II 15, 96	139, 1
f. 95 ^r , ‘Illud cum accenderis licmen’	II 16, 96	139, 2
f. 95 ^r , ‘In manu sua qui tenuerit’	II 17, 9	140, 1
f. 95 ^r , ‘Illud si accenderis licmen’	II 22, 98	142, 1 ¹⁰⁸
f. 95 ^r , ‘Accipe auruncos iiii’	II 32, 100	146, 2 ¹⁰⁹
f. 95 ^r , ‘Accipe pannum exequiarum’	II 33, 100	147, 1
f. 95 ^r , ‘Recipe cutem serpentis’	II 34, 100	147, 2
f. 95 ^r , ‘Recipe cutem lupi’	II 35, 101	147, 3
f. 95 ^r , ‘Recipe pannum lini novum’	II 36, 101	148, 1
f. 96 ^r , ‘In capite summi animalis’ ¹¹⁰	II 37, 101	148, 2
f. 96 ^r , ‘Accipe pannum funeris’	II 39, 102	

As can be seen from the above table, there are passages that may be found in the *Liber vaccae* but not in the *De mirabilibus mundi*, whereas the opposite is not true. According to Occam’s razor, this suggests the former as the more probable source. Textual comparisons appear to point to the *Liber vaccae* instead of the edited version of the *De mirabilibus mundi* as well, as exemplified by the comparison below:

Göttingen 63 (f. 95^r): ‘Illud cum accenderis licmen in ede videbis domum sicut argentum album’

Liber vaccae: ‘Licinium aliud bonum. Cum accenderis ipsum videbis domum sicut argentum album’

De mirabilibus mundi: ‘Licinium aliud, quod cum accenditur, omnia videntur alba et argentea’

Moreover, Göttingen 64a provides further arguments for the priority of the *Liber vaccae*. In this version, the seventh chapter begins with a rather corrupt copy of a passage from the *Liber vaccae*, in which the anonymous author, according to David Pingree, ‘describes without naming them the

¹⁰⁸ In the *De mirabilibus mundi*, what should be the beginning of this recipe (as in the *Liber vaccae* and the *Bellifortis*) is placed at the end of the preceding one.

¹⁰⁹ Cf. note xci in Sannino’s edition, which identifies this as II 33 of the *Liber vaccae*.

¹¹⁰ *Summi animalis* replaces the *hominis* of the *Liber vaccae*. Konrad uses the same phrase elsewhere in a verse caption (Göttingen 63, f. 94^r), glossed ‘puto esse leonem, veritas mihi non constat’ in Vatican 1994, f. 71^r.

Šābian magi of Ḥarrān and their magical deeds.¹¹¹ In addition, the ninth chapter of Göttingen 64a features a collection of ‘houses’ and ‘suffumigations’ found in the *Liber vaccae* but not in the *De mirabilibus mundi*. The table below supplements the previous table by listing the passages which are exclusive to the older ten-chapter version of the *Bellifortis* and have parallels in the *Liber vaccae*:

<i>Bellifortis</i> (Göttingen 64a)	<i>Liber vaccae</i>
f. 80 ^v , ‘Inquid Humaym quidam’	I 33, 84–85
f. 107 ^v , ‘Cum volueris facere domum ex auro’	I 20, 76–77
f. 118 ^r , ‘Cum volueris facere domum quam videas similem igni’	I 19, 75–76
f. 118 ^v , ‘Suffumigatio bonam efficiens animam’	I 39, 88
f. 118 ^v , ‘Item ad idem confeccio bona’	I 40, 88
f. 118 ^v , ‘Confeccio que attrahit gaudium’	I 41, 88
f. 123 ^v , ‘Cum volueris facere domum qui ingrediatur eam patiat’	I 18, 75
f. 124 ^r , ‘Hec est domus sapientium’	I 16, 73–74

Curiously enough, the only passages listed in the two tables that occur in the seven-chapter version of the *Bellifortis* are the two recipes beginning ‘accipe ex aliera’ and ‘accipe ex ere calconis’ (both Göttingen 63, f. 90^v). These are also the only recipes of the first table that occur in the older ten-chapter version.¹¹² Further, the Linz manuscript, a late copy, which is unique among the *Bellifortis* manuscripts by virtue of copying (among other things) captions without the associated illustrations, features an excerpt from the *Liber vaccae* not found in Göttingen 64a (or the other Latin manuscripts), beginning ‘Cum volueris facere domum cum intrabis in eam videbis in ea solem in nocte sicut in die.’¹¹³ There is no compelling reason to assume that this passage would be a later interpolation or addition to the collection acquired by the copyist of the Linz codex. On the contrary, the fact that the collection of texts does not match any of the extant versions of the *Bellifortis*, coupled with the separation of captions and illustrations, could be taken to indicate that the exemplar represented the original unedited material used by Konrad.

To further confuse matters, both the *Liber vaccae* and, consequently, the *De mirabilibus mundi*

¹¹¹ David Pingree, ‘Plato’s Hermetic Book of the Cow’, in Pietro Prini ed., *Il Neoplatonismo Nel Rinascimento*, Istituto della Enciclopedia Italiana: Rome 1993, 133–45; 142–43. See also Pingree 2001, 118, 120–21; Page 2013, 136. The passage in the *Bellifortis* (Göttingen 64a) was first discussed in Berg & Friedrich 1994, 205 note 125; Friedrich & Rädle 1995, 20 but identified for the first time in Cermann 2013.

¹¹² Göttingen 64a, f. 87^r; Chantilly 348, f. 128^v. In the later copies, both are found in Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, f. 132^v, and only the latter is found in Wien, Österreichische Nationalbibliothek, cod. 5278, f. 136^v; Göttingen, SUB, 2^o Cod. Ms. philos. 64 Cim., f. 77^r; Strasbourg, Bibliothèque nationale et universitaire, Ms. 2259, f. 68^v; München, Bayerische Staatsbibliothek, Clm 30150, f. 76^v; and Wien, Österreichische Nationalbibliothek, cod. 5518, f. 77^r.

¹¹³ Linz, Oberösterreichische Landesbibliothek, Hs. 420, p. 44 (cf. *Liber aneguemis maior* 17, 74–75). The passage in question, along with ‘Cum volueris facere domum ex auro’ (p. 45) and ‘...quam videas similem igni’ (p. 308), which both occur in Göttingen 64a, ff. 107^v and 118^r, are not identified in the most recent description of the Linz manuscript; see Katharina Hranitzky & Michaela Schuller-Juckes & Susanne Rischpler, *Die illuminierten Handschriften, Inkunabeln und Frühdrucke der Oberösterreichischen Landesbibliothek in Linz. Handschriften und frühe Drucke 1440-1540. Teil 1: Österreich, Passau, Italien. Textband* (Veröffentlichungen zum Schrift- und Buchwesen des Mittelalters, Reihe V: Die illuminierten Handschriften und Inkunabeln in Österreich außerhalb der Österreichischen Nationalbibliothek 6/1), Verlag der Österreichischen Akademie der Wissenschaften: Wien 2018, 107–8.

share texts with the *Liber ignium* ascribed to ‘Marc(h)us Graecus’.¹¹⁴ Similarities between the *Liber ignium* and the *De mirabilibus mundi* were already noticed by Gabriel La Porte du Theil in his edition published in 1804.¹¹⁵ He notes several parallels but unfortunately refers to pages of a printed edition of the *De mirabilibus mundi* which he does not identify.¹¹⁶ There are two passages in the seventh chapter of the *Bellifortis* (Göttingen 63, f. 95^r) which are found in the *Liber ignium*, the *De mirabilibus mundi*, and the *Liber vaccae*. As already demonstrated above, these passages should be seen as taken from the *Liber vaccae*. There are, however, passages clearly excerpted from the *Liber ignium*, as has been noted in previous research.¹¹⁷

At the very beginning of the eighth chapter of the revised ten-chapter version (Göttingen 63, ff. 100^r–103^r), there is a continuous section of prose which has, at first glance, the appearance of an insertion from the *Liber ignium*, beginning with ‘Incipit liber Ignium cuius virtus et efficacia est ad comburendum tam In mari quam In terra et plurimum efficax invenitur’.¹¹⁸ However, only the first eleven passages can be identified with the *Liber ignium*. These excerpts are only found in the revised ten-chapter version, though the *Liber ignium* appears to be invoked in the introductory verse of both manuscripts of the ten-chapter version.¹¹⁹ The table below lists the textual parallels between the *Bellifortis*, again based on Göttingen 63, and the *Liber ignium* (including the two passages from the *Liber vaccae* of the seventh chapter), referred to by the numbering of Berthelot’s edition:

<i>Bellifortis</i> (Göttingen 63)	<i>Liber ignium</i>
f. 95 ^r , ‘Illud cum accenderis licmen in ede’	19
f. 95 ^r , ‘Accipe pannum exequiarum recentem’	20
f. 100 ^r , ‘Incipit liber ignium cuius virtus et efficacia’	1
f. 100 ^r , ‘Ignis qui comburit domos’	2
f. 100 ^r , ‘Ignis, qui comburit hostes’	3
f. 100 ^r , ‘Oleum vero sulphuris’	4
f. 100 ^r , ‘Alius modus’	5
f. 100 ^r , ‘Ignis alius’	6
f. 100 ^r , ‘Sub pacis namque specie’	6–7

¹¹⁴ Possibly the *Marqūnis* of Arabic alchemists, see Fuat Sezgin, *Geschichte des arabischen Schrifttums IV*, Brill: Leiden 1971, 57.

¹¹⁵ [François-Jean-Gabriel de La Porte du Theil] ed., *Liber Ignium ad comburendos hostes auctore Marco Græco; ou Traité des feux propres a détruire les ennemis, composé par Marcus le Grec*, [Paris] 1804.

¹¹⁶ The page range suggests one of the collections with the *De secretis mulierum*, *De virtutibus*, and *De mirabilibus mundi* with scholia, but I have not been able to pinpoint the exact edition. The correspondences La Porte du Theil notes are the following, with paragraph numbers taken from Romocki’s edition: 13 : p. 188, 19 : p. 181, 21 : p. 186, 23 : p. 183, 26 : p. 183, 27 : p. 186, 28 : p. 186, 29–30 : p. 186, 34 : p. 188. The same passages, except 27, are listed (with references to the Venice edition of *Alberti Magni liber aggregationis seu secretum de virtutibus herbarum, lapidum et animalium; De mirabilibus mundi* printed not before 1487, ISTC ia00257000) in Käs 2012, 20 note 57.

¹¹⁷ Romocki 1895, 148–151; Quarg 1967, 67–68. Quarg identifies ‘accipe pannum aut stuppam’ (Göttingen 63, f. 92^v) as an extract from the *Liber ignium* (58), but I have been unable to find a match in Berthelot’s edition.

¹¹⁸ Cf. ‘Incipit Liber ignium, a Marco Græco descriptus, cujus virtus et efficacia ad comburendos hostes, tam in mari quam in terra, plurimum efficax reperitur’, Marcus Graecus, ‘Liber ignium ad comburendos hostes’, M. Berthelot ed., in Marcelin Berthelot, *La Chimie au Moyen Âge. Tome premier*, Imprimerie Nationale: Paris 1893, 100–20, at 100.

¹¹⁹ ‘Ignes in octauo capitulo sunt coascripti / ad comburendum hostes’, Göttingen 63, f. 99^r; Göttingen 64a, f. 92^v.

f. 100 ^r , ‘Ignis quem invenit Aristotiles’ ¹²⁰	8
f. 100 ^r , ‘Ignis compositio ad linimentum spere prefate’	8
f. 100 ^v , ‘Ignem presentem Aristoteles’	(9) 10
f. 100 ^v , ‘Nota quod omnis ignis’	11

The section of the eighth chapter, containing the above, is for the most part unique to Göttingen 63. The most notable exceptions are two series of recipes that occur in the seven-chapter version as well. The first is the series of five recipes on f. 101^{rv} (‘Ignis tonitrus’, ‘Ignis exiens’, ‘Hoc modo facias volare ignem’, ‘Igni volans in aere’, ‘Recipe sulphuris viui et calcis viue ana vnciam vnam’),¹²¹ the second is the series of nine recipes on ff. 102^v–103^r, five in prose (‘Ista est aqua ardens’, ‘Modus ad ignem componendum’, ‘Sequitur alia species ignis’, ‘Oleum ardens’ ‘Ignis grecus’),¹²² four in verse (‘Stercus columbe contritus’, ‘Stercus columbe cum petroleo’, ‘Calcem viuam summe/Capitulum mirabile’, ‘Elementum summum ferunt’).¹²³ The verse below constitutes the second to last paragraph of this section, found only in Göttingen 63:

Calcem viuam summe misce cum modica cera
 Oleo sisanie / alba napta / sulphure viuo
 Hominis ymaginem ex hijs formare studebis
 Aqua quam cooperis statim ardet sed si reducis
 Ad humiditatem suam / redibit tunc velud ante.¹²⁴

This verse, composed in Konrad’s unmistakable style, appears to be based on the following prose text found in the seven-chapter version:

Capitulum mirabile ut facias ymaginem hominis et cum cooperis ipsam aqua, accendetur ignis, et si reduceris et extraxeris, redibit ad humiditatem suam. Recipe calcem viuam et misce cum aliquantula cera et oleo sisanie ac napta alba atque sulphure viuo et fac ymaginem.¹²⁵

¹²⁰ The spurious references to Aristotle are, of course, part of the text of the *Liber ignium* and not to be considered as Konrad himself quoting (Pseudo-)Aristotle.

¹²¹ Cf. Chantilly 348, ff. 118^v–19^r. All five are found in Wien, Österreichische Nationalbibliothek, cod. 5278, ff. 126^r–27^r and Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, ff. 119^v–20^r. All but the first and fifth are found in Göttingen, SUB, 2^o Cod. Ms. philos. 64 Cim., f. 73^v; Strasbourg, Bibliothèque nationale et universitaire, Ms. 2259, f. 70^v; München, Bayerische Staatsbibliothek, Clm 30150, f. 73^r; Wien, Österreichische Nationalbibliothek, cod. 5518, f. 74^v; the bilingual manuscript Colmar, Bibliothèque municipale, Ms. 491, f. 78^v features only the German translations of the three. The first one (‘Ignis tonitrus’) is similar to no 980 in Dorothea Waley Singer & Annie Anderson & Robina Addis, *Catalogue of Latin and Vernacular Alchemical Manuscripts in Great Britain and Ireland Dating from before the XVI Century. Vol II*, Maurice Lamertin: Brussels 1930.

¹²² Chantilly 348, ff. 116^v–17^r. Also found in Wien, Österreichische Nationalbibliothek, cod. 5278, ff. 125^v and Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, ff. 118^v.

¹²³ Vatican 1994, ff. 119^{rv} (missing ‘elementum summum ferunt’; followed by Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1986, ff. 146^v, 153^v and Wien, Österreichische Nationalbibliothek, cod. 5278, ff. 127^r, 130^r, though the latter is missing ‘stercus columbe contritus’); Chantilly 348, ff. 119^r, 122^v; followed by Madrid, Real Biblioteca de San Lorenzo de El Escorial, MSY-II-21, f. 120^{rv}. ‘Stercus columbe contritus’ and ‘elementum summum ferunt’ are also found in Göttingen 64a, f. 95^v.

¹²⁴ Göttingen 63, f. 103^r.

¹²⁵ Vatican 1994, f. 119^r; cf. Chantilly 348, f. 119^r.

The passage is indeed similar in content to one found in the *De mirabilibus mundi*, which J. R. Partington appears to cite as an example of recipes ‘very similar’ or ‘identical’ to those of the *Liber ignium*.¹²⁶ In the *De mirabilibus mundi*, it is presented as the ‘opposite’ of a recipe which enables one to throw items into the fire without them being burnt, which has a parallel in the *Liber vaccae* (II 24, 98; incidentally, followed by a ‘capitulum mirabile’). Whatever its origin, its presence in the manuscripts of the *Bellifortis* demonstrates that Konrad used sources of this type as raw material for his verse as well, as already discussed above in the case of his verse instructions on using *magnes*.

In addition to the excerpts from the *Liber vaccae* and the *Liber ignium* discussed above, there are some secrets concerning animals, which are derived from the Latin translation of the *Kyranides*, a compilation based on Greek works about magic, dated to the first or second century. The compilation consists of six books, which detail the magical properties or secrets (*φύσεις* or *δυνάμεις*) of animals, plants, and stones.¹²⁷ The passages found in the *Bellifortis* are from the second book (‘de quadrupedibus’). They occur as two sets of texts on the ass and the horse. The former is found in the eighth chapter of the revised ten-chapter version and in the seventh chapter of the seven-chapter version, the latter only in the seventh chapter of the seven-chapter version, in Chantilly 348, and in a few other manuscripts. The passages are listed in the table below. The references to the *Kyranides* are to the edition of Louis Delatte (book and page numbers).¹²⁸

Incipit	<i>Bellifortis</i> 10-ch. (Göttingen 63)	<i>Bellifortis</i> 7-ch. (Chantilly 348)	<i>Bellifortis</i> 7-ch. (add.)	<i>Kyranides</i>
‘Equi fel dulcoratum’	f. 106 ^r	f. 151 ^v	¹²⁹	II, 112
‘Fel autem cum melle’	f. 106 ^r	f. 151 ^v	¹³⁰	II, 112
‘Vngula equi suffumigata’	f. 106 ^r	f. 151 ^v		II, 112
‘De subtiliori ferro’		f. 153 ^r	¹³¹	II, 122–123
‘Si quis dormiuit’		f. 153 ^r	¹³²	II, 123
‘Ex anteriori parte’		f. 153 ^r	¹³³	II, 123

¹²⁶ ‘Si vis facere contrarium, scilicet imaginem aliquam hominis aut alterius, et quando ponitur in aqua, accenditur, et si extraxeris eam, extinguitur, accipe calcem non extinctam, et permisce eam cum aliquantulo cerae, et oleo sesami et naphtha, id est terra alba, et sulphure, et fac ex illo imaginem: nam quando tu roborabis aquam, accendetur ignis.’ *De mirabilibus mundi*, 143–44. ‘If you will make a contrary, that is an image of a man or any other thing which when it is put in water is inflamed and when it is taken out of it, is extinguished, take quicklime and mix it with a little wax, and sesame oil, and naphtha, and white earth, and make an image of it, which when you sprinkle it with water, will inflame.’ Partington 1960, 84–85.

¹²⁷ Maryse Waegeman, *Amulet and Alphabet: Magical Amulets in the First Book of Cyranides*, J. C. Gieben: Amsterdam 1987, 7. For the Greek text of the complete work, see Dimitris Kaimakis, *Die Kyraniden* (Beiträge zur klassischen Philologie 76), Anton Hain: Meisenheim am Glan 1976.

¹²⁸ Louis Delatte, *Textes latins et vieux français relatifs aux cyranides* (Bibliothèque de la Faculté de Philosophie et Lettres de l’Université de Liège 93), Faculté de Philosophie et Lettres: Liège 1942.

¹²⁹ Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1986, f. 155^v; Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, f. 157^r.

¹³⁰ Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1986, f. 155^v; Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, f. 157^r.

¹³¹ Wien, Österreichische Nationalbibliothek, cod. 5278, f. 161^v.

¹³² Wien, Österreichische Nationalbibliothek, cod. 5278, f. 161^v.

¹³³ Wien, Österreichische Nationalbibliothek, cod. 5278, f. 161^v.

‘Si quis a scorpione’		f. 153 ^r	¹³⁴	II, 123
‘Pili autem aurincule’		f. 153 ^r	¹³⁵	II, 123

Though not all recipes, secrets, and experiments found in the *Bellifortis* are easily identified, it can be safely assumed that they are not original creations by Konrad.

Conclusion

As revealed by the present study, Konrad compiled his treatment of astrological matters by combining what may have been his original composition with mnemonic verse drawn from the existing body of medieval astrological literature. In the same vein, he collected ‘secrets’ or recipes drawn from at least the *Liber ignium*, the *Liber vaccae* (as argued), and the *Kyranides*.

The selections of recipes found in various manuscripts may have some implications for the history of the different versions of the *Bellifortis*. The prose paragraph entitled ‘Capitulum mirabile’ found in the seven-chapter version, undoubtedly extracted from an unidentified source, was turned into verse for the revised ten-chapter version, which is indicative of a work in progress. Both ten-chapter versions contain unique selections of excerpts from outside sources, perhaps reflecting Konrad’s changing ideas regarding the expectations of his royal dedicatees. The codicological evidence indicates that the seven-chapter version emerged later than the ten-chapter version, but perhaps the seven-chapter version nevertheless represents the original core of the *Bellifortis*, without the new content and subdivisions, which were added with the impact of a dedication copy in mind.

Despite its title, the *Bellifortis*, particularly the ten-chapter version, is not just a treatise on poliorcetics and related topics, but a *liber secretorum*, a book of secrets. Accordingly, a complete concordance of all the recipes found in the *Bellifortis* would have significance beyond the history of Konrad’s work. Compiling such a concordance would require digitised editions or at least accessible transcriptions of the vast corpus of relevant manuscripts. Without such tools, discovering parallels depends on a combination of scholarly intuition and luck. For example, a recipe for an invisible ink found in the revised ten-chapter version is almost identical to the one scribbled in the margin of Michael Kopmann’s chronicle of St Nicholas of Wismar.¹³⁶ In addition, the magical words found in Chantilly 348 appear not only in the margin of a twelfth-century breviary (as noted by Regina Cermann), but also in an incantation associated with the heliotrope in a late-fourteenth-century

¹³⁴ Wien, Österreichische Nationalbibliothek, cod. 5278, f. 162^r; Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. lat. 1986, f. 155^v.

¹³⁵ Madrid, Real Biblioteca de San Lorenzo de El Escorial, Ms. Y-II-21, f. 157^r.

¹³⁶ Wismar, Archiv der Hansestadt Wismar, Geistliche Urkunden XLIX A 3, edited in Friedrich Crull, ‘Michael Kopmann’s Chronik St. Nicolai zu Wismar’, *Jahrbücher des Vereins für Mecklenburgische Geschichte und Altertumskunde* 47 (1882), 53–93, at 56: ‘Fol. 21: Ad faciendum litteram uel imaginem, que non posset uideri nisi in nocte, recipe fel canis et lignum salicis putrefacte et vermiculum de nocte splendentem et album oui et distempera simul et postea fac imaginem in pariete, et non apparebit nisi in nocte.’ Cf. Göttingen 63, f. 96^v: ‘Recipe fel canis et lignum salicis putridi ac vermis posteriorem partem lucentis in nocte equali pondere distempera insimul reclude in cristallo euacuato sic quod bene repleatur.’ In the *Bellifortis*, the purpose of this mixture is revealed in the recipe that immediately follows: ‘Recipe ad idem fel catuli et catti ana simul mixtis et fac ut supra vel scribe de eadem confectione quidquid vis et de nocte letetur sine lumine ut scis.’

medicinal manuscript.¹³⁷ Further, a recipe for the tempering of iron found in the Linz manuscript (immediately following the captions on *almerio*) may be identified with a recipe in Heraclius's *De coloribus et artibus Romanorum*.¹³⁸ Though unable to account for the sources of all of Konrad's *secreta*, it is hoped that this study has provided some relevant insights into both the history of the *Bellifortis* and the writing practices of medieval author-compilers of pragmatic literature.

¹³⁷ In the *Bellifortis*: Chantilly 348, f. 153v; Wien, Österreichische Nationalbibliothek, cod. 5278, f. 162r; Linz, Oberösterreichische Landesbibliothek, Hs. 420, p. 17. Cf. Nürnberg, Germanisches Nationalmuseum, Hs. 23374, f. 212v; Hardo Hilg, *Die lateinischen mittelalterlichen Handschriften, zweiter Teil. Hs 22922–198390, Anhang* (Die Handschriften des Germanischen Nationalmuseums Nürnberg 2/2), Otto Harrassowitz: Wiesbaden 1986, 21; Cermann 2013, 78; and München, Bayerische Staatsbibliothek, Cgm 822, f. 40v; Karin Schneider, *Die deutschen Handschriften der Bayerischen Staatsbibliothek München. Cgm 691–867* (Catalogus codicum manu scriptorum Bibliothecae Monacensis 5/5) Otto Harrassowitz: Wiesbaden 1984, 474.

¹³⁸ Edited in Mary P. Merrifield, *Original Treatises, Dating from the XIIth to the XVIIIth Centuries, on the Arts of Painting, vol. I*, John Murray: London 1849, 182–257. Cf. bk 1, no 13 on p. 197 with Linz, Oberösterreichische Landesbibliothek, Hs. 420, p. 18.