PŪRVĀPARAPRAJÑĀBHINANDANAM
EAST AND WEST, PAST AND PRESENT

Indological and Other Essays in Honour of Klaus Karttunen

Edited by

Bertil Tikkanen & Albion M. Butters

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IN HORIS SANGUINIS: PHYSIOLOGY AND GENERATION IN THE PSEUDO-GALENIC *DE SPERMATE*

Outi Merisalo

ABSTRACT

Among texts made popular during the late thirteenth- and early fourteenth-century Galenic Renaissance at European universities and among practitioners figures the Pseudo-Galenic *De spermate*, most likely a Latin translation of a Late Antique Greek text, which has very little in common with the authentic *Peri spermatos* by Galen. This paper traces the textual history from the earliest witnesses until the age of printing, and examines the teachings on physiology and generation of this treatise, which presents an interesting variant of the doctrine of the four humours as applied to determining the characteristics of the individual by means of a complicated chrono-biological system.

INTRODUCTION

The late thirteenth- and early fourteenth-century Galenic renaissance at European universities, such as Bologna, Padua, Montpellier and Paris, made possible by the Latin translations and compilations of the previous centuries, of course generates an upsurge of copies of the central authors of the new curriculum known as the *Articella*, i.e. Galen, Avicenna, Rasis, Constantine the African, Giles (Aegidius) of Corbeil, Theophilus Protospatharius, but also more peripheral texts. Among the latter, the anonymous *De spermate*, often attributed to Galen and confused by mediaeval scribes and modern catalogue authors alike with the authentic Galenic treatise *Peri spermatos*, is an item typical of the great Galenic omnibus volumes of the thirteenth, fourteenth and fifteenth centuries. Its extension and, consequently, contents, vary from branches of tradition to another, just as the titles of the work range from *De XII portis* through *Microtegni* and *Compositio hominis* to *De humana natura*. The global dissemination of this text covers Western Europe from England to Northern Italy and Western France to the mainly Germanic part of the Empire. The number of known manuscripts containing the text is

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now 44 and counting. Since the late 1990s, the present author has been engaged in an electronic edition project of the text together with Professor Päivi Pahta, of the University of Tampere, who has published an edition with commentary of the only vernacular translation of the Latin text (Pahta 1998). The website, which contains a transcription of the text contained in the twelfth-century Cotton Galba E IV manuscript, will eventually give codicological descriptions and an electronic edition of the whole tradition (<staff.jyu.fi/Members/merisalo/despermate>). Part of the research for this paper has been funded by the Academy of Finland project *Books in transition* (n° 121785).[1]

FROM LATE ANTIQUITY TO THE LATE MIDDLE AGES

De spermate is most probably a mediaeval Latin translation of a Greek original from Late Antiquity. Apart from a generically Hippocratico-Aristotelic system of the four humours (blood, yellow and black bile as well as phlegm) and the four qualities (cold, hot, humid, dry), as well as the origin and formation of sperm, it bears little resemblance to Galen's views, and, especially, does not draw on the authentic treatise *Peri spermatos*, that would only be translated by Nicholas of Reggio into Latin in the fourteenth century.[2]

De spermate makes its appearance in Latin towards the middle of the twelfth century. The two most ancient copies known are British Library, Cotton Galba E IV, most probably written in England, maybe at Bury St Edmunds known for its scientific interests, and Paris, BNF, lat. 15114, which was written in the South of France. A third early manuscript, containing part of the treatise, Munich, Bayerische Staatsbibliothek, Clm 4622, was written at the Bavarian monastery of Benediktbeuern at the end of the twelfth century (see Glauche 1994: 223), whereas a fourth manuscript from the same period, Munich, Bayerische Staatsbibliothek, Clm 18918, originates in the monastery of Tegernsee (see Halm, von Laubmann & Meyer 1878 (1969): 223; Burnett 1985: 7). In some of the 44 known witnesses the translation is attributed to Constantine the African (1020–1087), in others

1 I have the pleasure of thanking Prof. Nancy van Deusen (Claremont Graduate University, California), and the participants of the symposium *Blood: Dynasty, Sacrament, Sacrifice* organized by her at CGU (26–27 February 2010), for valuable comments and inspiring discussions, as well as Dr. Elizabeth Peterson (University of Helsinki) who kindly revised my English.

2 His authentic text, *Peri spermatos*, was translated into Syriac by the Hunain ibn Ishaq aka Johannitius in 840–841, into Arabic maybe by one of his pupils, and finally into Latin in the fourteenth century by Niccolò da Reggio (for Niccolò, see Nutton 2010). Galen's Greek text is edited in De Lacy (1992). In Latin manuscripts Galen's text also occurs under the title *De spermate*. Though modern scholarship normally refers to Galen's text as *De semine*, the titles *De spermate* and *De semine* are sometimes used for both texts.

to Copho of Salerno (eleventh century) and in yet others to Arnold of Villanova (d. 1314), but neither Constantine nor these other authors ever refer to it in their authentic works. The absence of early witnesses from the Apennine peninsula is striking, although this does not as such exclude Southern Italy as the origin of the Latin translation. As Monica H. Green has recently shown (Green 2008: 32, 38), Southern Italian texts of medical praxis start circulating in England and Normandy in the twelfth century, whereas even Constantine is conspicuously absent in the southern parts of the Apennine peninsula. From the earliest copies on, the heavy Greek terminological apparatus and the long lists of characteristics seem to have challenged the concentration of the scribes, with in part disastrous consequences for the comprehensibility of the text. The use of *De spermate* in teaching, moreover, has led to part of the tradition not being copied visually and word for word, but long passages having been paraphrased and functional variants (e.g. *ad x-um* and *ut x fiat*) substituted for each other. Some passages, right from the beginning of the text, are repetitive to the point of suggesting the incorporation of marginal annotations.

As pointed out earlier, the extent and, consequently, the contents of the text vary. The different formulae may be synthesized as follows.

De spermate: contents[3]

1. Embryological treatise

> Galba 1–654: Formation and characteristics of sperm, the genital organs of man and woman, including the seven-celled uterus, the four humours (blood, flegm, yellow bile and black bile) and the diseases connected to them; characteristics of the child as determined by the conditions of its conception; formation of the temperament (choleric, melancholic, flegmatic, sanguine); the impact on the child of the hour of conception of the father, the mother, the grand-father and the grand-mother.

3 In the following, we shall refer to the lines of the Galba text at <https://staff.jyu.fi/Members/merisalo/Transcriptionprinciples.htm>, as well as the 227 lines of the extension as contained in Berlin, Staatsbibliothek zu Berlin – Preussischer Kulturbesitz (= SBB–PK), lat. fol. 638, f. 251va–252va.

2. Astrological treatise

2a. Planets, seasons, geography, temperament: impact on individuals

Galba 655–1006: impact of the planets on the personal characteristics, impact on the personal qualities and diseases of the characteristics (hot, cold, dry, humid) of the zodiacal signs, seasons, geographical regions and temperaments.

2b. Four qualities: impact on geographical regions and diseases

e.g. Berlin, SBB–PK, lat. fol. 638 f. 251va–252va (NE France, end of thirteenth c.), lines 1–227: astrological and physiological treatise on geographical regions considered from the point of view of the four qualities (hot, cold, dry, humid) and their impact on the diseases.

Formula 1: maximal contents = 1 + 2, i.e. embryological and all of the astrologico-physiological treatise

Example 1: two treatises, one title

Berlin, SBB–PK, lat. fol. 638, f. 248va–252va: *I(n)cip(it) lib(er) Gal(ieni) de sp(er)mate*. Sperma hominis desc(e)ndit ex om(n)i humore cor(por)is, expl. f. 252va n(atura)m sui corporis (= Galba 1–1006 + Berlin 1–227).

Example 2: two treatises, different titles

Oxford, Balliol College, 231 (England, *c.*1300): 1) f. 34vb: *Hic incipit liber Microtegni galieni l. de spermate.* Sperma hominis descendit ex omni humore corporis, expl. f. 37rb: sic alexander. altitudinem operis aggressus est super omne. *Explicit liber de spermate* (= Galba 1–691).

2) f. 37rb: *Incipit liber Galieni de .xii. signis uel elementoris*. Sciendum quod .xii. sunt signa tria calida & sicca, expl. per naturam sui corporis. *Explicit liber de xii portis uel microtegni galieni* (Galba 692–1006 + Berlin 1–227).

Formula 2: 1 + part of 2

Example 1: 1 + 2a

Londra, BL, Cotton Galba E IV (England, *c.*1150), f. 233vb–238va

Sperma hominis descendit ex humore toti(us) corp(or)is --- f. 238va p(er) q(ua) m acutione(m) (et)-mutatione(m) passiones ab humano corpore p(ro)cedunt. *Explicit liber sp(er)matis* (= Galba 1–1006).

Example 2: 1 + part of 2a

Paris, BNF, lat. 15114 (S. France, *c.*1150), f. 163v–170v:

Sp(er)ma ho(m)i(ni)s desce(n)dit ex o(mn)i humor(um) o(mn)is corporis --- f. 170v (et) sicc(us) erit i(n) estate (= Galba 1–807).

Formula 3: part of 1

Example: BNF, lat. 6988 (Paris, *ante* 1289), f. 161a–163vb:

Sp(er)ma ho(m)i(ni)s descendit ex o(mn)i hu(mo)re corp(or)is --- Si sp(er) ma omniu(m) fu(er)it i(n) m(at)rice p(at)ris eor(um) in eisd(em) horis magne eloq(ue)ntie eru(n)t (= Galba 1–619).

Formula 4: 2a + part of 2b

Example: Munich, Clm 18918 (Tegernsee, end of twelfth c.), f. 68–71:

Sciendu(m) est q(uo)d .xii. signa sunt --- s(ed) m(od)o possum(us) dic(er) e ; Sciendu(m) tam(en) q(uo)d alia mutatio est --- inc(on)gruo tempore; Sciendu(m) est q(uod) orbis terrę --- hieme(m)q(ue) p(er)ficit (= Galba 691–722; 829–876, Berlin 3–66).[4]

All twelfth-century manuscripts, London, BL, Cotton Galba E IV, BNF, lat. 15114, Munich, Clm 4622 and 18918, contain only part of what would later circulate as *De spermate/Microtegni/De XII portis* etc. The Galba manuscript lacks about half of the astrological section, whereas the Paris manuscript only contains lines 1–807 and the Munich-Benediktbeuern one lines 1–144 of the Galba text.[5] Interestingly enough, the Munich-Tegernsee manuscript only contains lines 691–876, i.e. part of the astrological section, of the Galba text. The largest extension only seems to get fixed in the thirteenth century,[6] though extracts, rather than the complete text, characterize many of the thirteenth–fifteenth-century manuscripts. The text is particularly popular in France and England from the thirteenth century onwards; in the fourteenth century it also spreads to Northern Italy and, in the fifteenth century, it re-appears in the Empire.[7]

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4 I am grateful to Charles Burnett, Warburg Institute, London, for drawing my attention to this manuscript and kindly passing on reproductions of the relevant section in 2006.

5 In the case of the latter manuscript, the original extension has been greater, since the text abruptly stops at the end of a gathering (f. 80v). Cf. note 9.

6 This is also true for e.g. the Trotula set of gynaecological texts, which underwent heavy editing in the twelfth century (Green 2008: 41).

7 See Merisalo (2008b). The text of the fifteenth-century London, Wellcome Library, 538 (Miscellanea Medica VIII), copied in Southern Germany, is closely related to e.g. the NE French Berlin, SBB–PK, lat. fol. 638 (end of thirteenth c.) and Paris, BNF lat. 6988, written in Paris sometime before 1289. The *De spermate* fragment Munich, Clm 490, written by the Nuremberg humanist Hartmann Schedel (1440–1514), medical doctor and author of the *Weltchronik*, presents close similarities to, though does not descend from, that of the twelfth-century Clm 4622 frag-

The treatise seems to have been associated with Galen in the thirteenth century, and starts circulating in the great Galenic omnibus volumes that are put together in that period (e.g. Basle, Universitäts- und Landesbibliothek, D III 8, from Normandy and Paris or Vatican, BAV, Pal. lat. 1094, from Southern France, both *c.*1300) (Merisalo 2008a: 55–56). The text still figures in *Galeni opera omnia* (Basileae 1542) and the Giunta Galen (Venetiis 1597), though doubts as to the connection with Galen had been voiced as early as the thirteenth century (Merisalo & Pahta 2008: 84–85).

GENERATION

So far, the precise doctrinal affiliation of the author or authors of *De spermate* has not been established. Kudlien 1965 pointed out the Neo-Platonic influence in a passage on the soul (Galba 333–353), where Porphyry, *Isagoge*, is quoted, and suggested third-century Alexandria as the place of origin, but considering the compilatory character of the work and the number of authorities – pseudo and authentic – quoted, it would not be wise to draw too far-reaching conclusions.

In fact, this text presents some very original characteristics: it seems to be the first to propose the doctrine of the seven-celled womb, and presents a detailed chrono-biological theory of the impact of the four humours on periods of time, well beyond the Hippocratico-Galenic doctrine of the correspondence of the four humours to the seasons and the ages of man.[8]

According to the *Corpus Hippocraticum*,[9] the human body consists of liquid and solid parts. The liquid body parts are the four body fluids, blood, yellow bile, phlegm and black bile – the last three two only become visible in changes in body

ment from Benediktbeuern. The text covers most of the "Classical" *De spermate*, well beyond the Galba text, up to line 170 (out of 227 lines) of the extension as preserved in Berlin, SBB–PK, lat. fol. 638, ff. 251va–252va. The Schedel text ends at *terra vertitur in humiditatem*, f. 252b, line 34. These facts seem to indicate the presence of a second *De spermate* manuscript, now lost, model for both Clm 4622 and 490, and maybe for Clm 18918 as well, in Bavaria from the end of the twelfth century to at least the fifteenth century.

8 The doctrine of the predomination of each of the humours according to the seasons belongs to the oldest core of the Corpus Hippocraticum (henceforward CH, see n. 14), i.e. the treatise *De natura hominis*, by Polybus, Hippocrates' disciple and son-in-law (end of fifth c. BC). Part of the theory of the predomination of the humours according to the ages of man is already sketched there, i.e. that black bile prevails between the age of 25 and 42 (alternatively 45). It is, however, Galen that fully develops the latter doctrine: blood in infancy, yellow bile in youth, black bile in maturity and phlegm in old age, Jouanna & Fischer (2007: 175).

9 A set of altogether *c.*70 writings by different authors, the nucleus of which was put together in Alexandria in the third century BC and ascribed to Hippocrates (fifth century BC), was transmitted in the Middle Ages in six MSS written between the ninth and the thirteenth centuries, Potter & Gundert (2010).

parts and in the secretions due to illness. The "Hippocratic" approach is based on the assumption that the body fluids must be in balance and the solid body parts must be whole – all illness is caused by imbalance and disturbances either in the quantity and temperature of the fluids, which may be caused by internal factors or outer traumas setting the fluids, specifically phlegm and bile, in motion, thus causing imbalance.[10]

While the Pseudo-Galenic *De spermate* presents some "Hippocratic" – or Galenic – elements, such as the decisive role of the four humours, and Aristotelic ideas, notably the essentially (King 2010) hot nature of man as opposed to the cold nature of woman, its account of the development of the embryo is very different. Both man and woman produce sperm: the special nerves and veins transporting man's sperm emit it through the rubbing and heating caused by the sexual act (6–7 *ex fricatione et calefactione uiri et mulieris emittunt illud*), it coalesces with woman's sperm and enters, together with a spirit (*spiritus*) the womb; after another spirit has been attracted to the exterior of the womb through thin arteries (20 *per arterias subtiles*), the warmth of the womb and of this latter spirit heats up the sperm. The outer spirit keeps the inner spirit from exiting (23–24 *Ille uero qui est exterior spiritus. non permittit exire interiorem spiritum)* and forces it to nourish and heat up the embryo (24–25 *sed constringit eum ad nutriendum puerum. et calefaciendum*). A third spirit, originating in blood, then enters the womb, coalesces with the sperm and thus changes it into flesh (28 *in carnalem naturam*)[11] again through the heat of the womb (*per calorem matricis*). The male characteristics appear after 30 days, the female after 41. Part of the blood descends to the womb to nourish the embryo, and part goes to the breasts where it gets transformed into milk. Blood (helpfully called *illa substantia*) attracts <more> blood for its own nourishment, and, through attracting, changes it into flesh.

Blood is produced by the liver – in this our author(s) concord with previous tradition, including Empedocles and Galen (Nutton 2004: 47) – which changes phlegm into blood (according to the majority of the manuscripts) with the help of the bile (Galba 33–38). The third spirit, which comes from the "more subtle

10 The four "Hippocratic" humours vary, some writings of the CH also including air (*pneuma*). Health is based on a balanced mixture of the bodily fluids and the integrity of the solid structures, whereas disease results from outward influences which change the quantity or temperature of the bodily fluids to the point of bringing them out of balance, with phlegm and bile set into motion and separated from the blood. They are then attracted and absorbed by various parts of the body, in particular if heated up or dried out. In the bloodstream phlegm and bile obstruct the regular flow of blood and air in the vessels, and, by settling into a given part of the body, injure it, causing the various symptoms of the disease. Conversely, inner or outer traumata of the solid parts of the body may cause disease, which influences the motion of the fluids, Potter & Gundert (2010).

11 The idea that flesh is formed from blood is already present in Empedocles, see Nutton (2010: 47).

nature of the blood", maybe arterial blood, changes sperm into flesh (according to 28; but according to 38, which reads *in sanguine*, <this change happens> 'in the blood', whereas a conspicuous number of other MSS read *in sanguinem* 'into blood'), as was mentioned above.

The embryo first develops shoulders and the attached bones and organs. Bones are formed from the four humours but mainly from the "heavier nature" of blood (probably venous blood). This "heavy blood" is formed through the marrow purging blood of its "more subtle nature" (probably arterial blood). Slowly the embryo transforms itself into a child and is born.

DETERMINING THE CHARACTERISTICS OF THE CHILD

A case in point is the above-mentioned chrono-biological system. A late Greek text, either late Antique or early mediaeval, entitled *On the formation of man*,[12] presents a sophisticated 12 + 12 hour day-and-night system: the first three hours of the day (i.e. from 6 until 9 a.m.) and the first three hours of the night (i.e. from 6 p.m. until 9 p.m.) are the hours of the blood, whereas yellow bile prevails from 9 a.m. until noon and 9 p.m. until midnight, black bile from noon until 3 p.m. and midnight until 3 a.m. and phlegm from 3 p.m. until 6 p.m. and 3 a.m. until 6 a.m.[13] The Greek treatise was translated at some time into Latin (*De formatione hominis*) and circulated in the thirteenth century.[14] This doctrine is exposed in much detail, partly in the same words as in *De formatione hominis*, in our text. Especially, the Latin text inverts the traditional order of the humours: instead of blood, yellow bile, black bile and phlegm, we have blood, yellow bile, phlegm and black bile both in *De formatione hominis* and *De spermate*:

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12 Edition: Jouanna (2006) – A related humoro-chronological theory is exposed in a treatise, maybe anterior to the fourth century AD and attributed to Hippocrates, entitled *On human pulse and temperament*: blood dominates from the ninth hour of the night (i.e. 3 a.m.) until the third hour of the day (9 a.m.); yellow bile from 9 a.m. until 3 p.m.; black bile from 3 p.m. until 9 p.m., and phlegm from 9 p.m. until 3 a.m. This doctrine was previously known from Latin sources datable to the period between the fourth and eight centuries AD. This theory is first attested in Vindician's letter to his grandson Pentadius, which is preserved in a MS datable to the eighth or ninth century. (Jouanna & Fischer 2007: 175)
Hi quattuor umores partiuntur sibi diem et noctem.
1. Sanguis dominatur horis sex, id est ab hora noctis nona usque in hora diei tertia.
2. Exinde dominatur cholera rubea ab hora diei tertia usque in hora diei nona.
3. Cholera autem nigra dominatur ab hora diei nona usque in hora noctis tertia.
4. Flegma autem dominatur ex hora noctis tertia usque in hora noctis nona; see Jouanna & Fischer (2007: 176).

13 Jouanna & Fischer (2007: 179).

14 Prague, Czech National Library, XIV.H.28, see Jouanna & Fischer (2007: 179, esp. n. 18).

> 443–449 Dicit ypocras. quod si mulier recipit sperma.<in prima uel>[*add.* BNF, lat. 15114] in secunda uel tercia diei hora uel noctis. puer est ex proprietate sanguinis. Quod si in .iiii. aut .v. aut .vi. hora conceptus fuerit. proprietatem retinet colerę Rubeę. Illę enim horę sunt suę. Quod si in .vii. uel .viiii. conceptus fuerit; retinet proprietatem flegmatis. Quod si .x. uel .xi. uel .xii. hora conceptus fuerit. retinet proprietatem colerę nigrę.

While this scheme is presented together with the properties of the individuals born during the hours of each humour in the *De formatione*, the author(s) of our text have come up with the characteristics at an earlier stage. The characteristics of the sanguine people are presented as follows:

> 249–261 Notandum quod si sperma ceciderit in .iii. horis sanguinis. natura eius mutatur. et firmatur. secundum naturam. sanguinis. Vnde homo idem creatus. rubrum habet colorem. Supercilia eius grauia. uenę timporum graues. et plene sanguinis. oculi sanguinei. et nebulosi. semper habundantes passionibus. labia et gingiue habundant sanguine. sanguis semper decurrit á naribus. Ex gutture uero repleto multo sanguine loquela grauis. et rauca. et debilis. Guttur etiam solet dolere. et dentes. et caput. et. os. Capilli tendunt ad rubedinem. ambulatio moderata.passiones ex reumate sanguinis. et sinochus. et alię quę sunt naturę sanguineę.

However, the ultimate characteristics of the child are not only determined by its own hour of conception. *De spermate* goes much further: the hour of the conception of the parents and the side of the womb where the sperm fall – to have males, basically the right-hand side, for females, basically the left-hand side – will determine the characteristics. For example:

> 460–466 Quod si conceptio infantis fuerit in horis sanguinis. patris aut matris conceptio fuerit in horis colere Rubee. si sperma in sinistra parte licet pater et mater concepti sint in horis colere Rubee. tamen infans non potest trahere ad se figuram ex colera Rubea a patre et matre propter frigiditatem sinistre partis. habet proprietatem passionum plus ex flegmate. uel colera Nigra quam ex colera Rubea.

The four qualities (hot, cold, dry, wet) associated with the sexes (males are hot and dry, females cold and wet) thus exercise an influence on the characteristics of the child. But even this is not the whole picture. After discussing the influence of the humours on the parents, the influence of the hour of conception of the grand-parents is explained:

> 620–627 Si pater pueri et auus. et puer concepti fuerint in horis sanguinis. mater uero pueri in horis flegmatis. et sperma ipsius matris superhabundat spermati patris. ita tamen quod sit debile; tunc infans non trahit figuram a

> patre. quia eius sperma superatur á spermate matris. neque á matre. quia eius sperma debile est.

After predicting in much detail the characteristics of the child, the author(s) wisely add a proviso:

> 655–656 Contingit aliquando etiam quod figura pueri nulli parentum suorum similis est.et hoc fit propter naturam planetarum.

Upon this observation, the author(s) embark upon an astrological treatise which discusses the qualities of the signs of the zodiac and the geographical regions, without any reference to the preceding discussions.

CONCLUSION

To sum up: the treatise *De spermate*, falsely attributed to Galen sometime in the thirteenth century, transmits a set of rare doctrines about generation, notably an extreme form of the doctrine of humours, which seems to track back to the Greek world of Late Antiquity. *De spermate* appears in Latin form in Southern France and England towards the middle of the twelfth century, and soon after, independently of those regions, in Bavaria. The Galba manuscript, written in England *c.*1150, associates the embryological section with one on astrology, which also seems to circulate separately in Bavaria somewhat later (the Munich–Tegernsee manuscript). The most extensive thirteenth-century version of *De spermate/Microtegni/De xii. portis/De humana natura* etc. contains the embryological treatise and a detailed astrological treatise, as transmitted in the manuscript Berlin, SBB–PK, lat. fol. 638. In this form, most often attributed to Galen and transmitted in the great Galenic omnibuses, the text gains huge popularity in medical teaching and practice in England and France from the thirteenth century onwards. In the fourteenth century, it re-enters the Holy Roman Empire and also appears in the Apennine peninsula. Due to the difficult technical terminology, the use of the text in teaching and the scope of the matter treated, it was not only extremely prone to copying mistakes but also invited paraphrasing and sampling. The textual variation and the different arrangements encountered reflect these characteristics and bear witness to the popularity of the treatise, which was read, commented on and used by medical professionals and interested laymen until the end of the Middle Ages.

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