How do cathartic drugs act ? A case study on Gregor Horst (1578-1636) and his attempt to defend Galenist theory.

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Summary

This case study deals with the argument of the Galenist author Gregor Horst (1578-1636), Medical Professor at Giessen University, Germany, and later town physician in Ulm, in the discussion on how purgatives act. Horst tried to reconcile a number of different opinions within a Galenist framework. His vast erudition enabled him to compare several classical as well as contemporary opinions. He takes into account Galen (129-C.200/216), Erasistratos (c. 330-255 BC), Asclepiades (fl. IstcenturyBC), the Hippocratic Corpus and the ProblemataAristotelis from antiquity, Mesue and Mundinus (c. 1270-1326) from the Middle Ages, and Jean Fernel (c. 1497-1558), Girolamo Cardano (1501-c. 1576), Johannes Costaeus (d. 1603), Laurent Joubert (1529-1583), Francisco Valles (1524-1592), Tobias Dorncreilius (1571-1605) andGabriele Falloppio (1523-1562) from contemporary authors. Horst also integrated some Paracelsian ideas from Joseph Duchesne alias Quercetanus (1549-1609). In his attempt to preserve fundamentals of Galenic thought, Horst created a complicated theory nearly breaking under its own weight. He shows a rising divergence within traditional views as well as the fragmentation of Renaissance Galenism which took place already before the discovery of the blood circulation.

Résumé

Cet article montre l'argumentation de Gregor Horst (1578-1636), Professeur de Médecine à l'Université de Giessen en Allemagne, et plus tard docteur municipal à Ulm, dans la discussion sur l'action de médicaments purgatifs. Il essaie de reconcilier plusieurs opinions différentes sur la base des théories de Galien. Son érudition le rend capable de comparer plusieurs opinions classiques et contemporaines. Horst tient compte de Erasistratos (environ 330-255 avant Jésus-Christ) Asclepiades (1er siècle avant Jésus-Christ) et Galien (129-environ 200/216), du Corps Hippocratique et des Problemata Aristotelis de l'Antiquité, Mesue et Mundinus (environ 1270-1326) du Moyen Age, et les auteurs contemporains Jean Fernel (environ 1497-1558), Girolamo Cardano (1501-environ 1576), Johannes Costaeus (mort en 1603), Laurent Joubert (1529-1583), Francisco Vallès (1524-1592), Tobias Dorncreilius (1571-1605) et Gabriele Falloppio (1523-1562). Horst incorpore aussi quelques idées Paracelsistes de Joseph Duchesne alias Quercetanus (1549-1609). Dans la tentative de préserver la base Galienne, Horst crée une théorie compliquée et très fragile. Les explications montrent les points de vue traditionnels qui divergent au cours de la Renaissance et la fragmentation du Galénisme pendant la Renaissance déjà avant la découverte de la circulation du sang.

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Introduction

According to ancient Greek humoral pathology, the balance of four body fluids, called humours - blood, yellow bile, black bile and phlegm - is responsible for good health. The four

humours possess certain characteristics, the primary qualities warm, cold, moist and dry. Blood is warm and moist, yellow bile warm and dry, black bile cold and dry, and phlegm is cold and moist. Secondary qualities, such as density, rarity, lightness, gravity, hardness and fragility, supposedly result from a specific mixture of primary qualities (1). "Galen regards all part of the body as a combination of the primary qualities, but modified by the addition of secondary qualities" (2). Excess of a particular humour or corrupt humours can lead to disease. Corrupt humours which cannot be improved, or an excess of a humour, have to be eliminated from the body. This removal, called purging, was seen as an important method of treatment from the time of Galen (129-c. 200/216) far into Early Modern times (3). The extensive use of purgatives in the treatment of the French king Louis XIV. (1638-1715) (4) is just one example of its great popularity in the 17th century.

The theoretical framework which justified the use of purgatives in Early Modern Galinism can be seen very well in the writings of Gregor Horst. Horst, professor at Giessen University, Germany from 1608 until 1622 and afterwards town physician in Ulm (5), defended Galenism in the early 17th century(6). He was held in high esteem by his contemporaries and called "deutscher Askulap" (7).

Four reasons make Horst very suitable for a case study : He considers purging an important part of his treatment. His vast erudition enables him to compare the views of a large number of classical and contemporary authors. He usually acknowledges his sources when he cites different opinions. Last, but not least, in his "Opera medica", which were edited by his son and include nearly all his writings, Horst does not present only texbook knowledge. At the end of the chapteron purgatives, he concludes with the "quaestiones", points of discussion among contemporary authors. So the reader gets a first-hand account of Horst's argumentation.

Horst had to meet the challenges of his day from within and outside traditional medicine. Already the 16th century had seen diverging opinions on drug action among Galenists, as Owsei Temkin showed in the writings of the famous physicians Jean Fernel (1497-1558), Laurent Joubert (1529-1583) and Thomas Erastus (1527-1583) (8). Studying Horst, we can extend Temkin's insights into the early 17th century.

During the Renaissance traditional learned medicine flourished due to reception of ancient texts and thereby stimulated research. However, it also saw itself challenged by Theophrastus von Hohenheim, called Paracelsus (1493-1541) and his followers. Paracelsus had condemned Galenism. He tried to replace it by an alternative natural philosophy, based on folk medicine, religion, astrology and the three active principles salt, sulphur and mercury, representing solidity, inflammability and spiritousness, respectively. Paracelsian doctors who had gained influence on German courts, such as Oswald Croll (1560-1608) and Johannes Hartmann (1568-1631), made chemical remedies popular (9). Horst had to take Paracelsianism seriously. In the introduction to his "Opera medica", he compared the Paracelsists with Empiricists and Methodists in antiquity, in his view two sects justly criticized by Galen. In Horst's opinion, the Paracelsians do not care enough for the method of reasoning, relying too much on experience alone (10). For a short review of some fundamentals of Galenism which Horst would not give up easily, let us turn first to the opinions of Galen and Fernel - whom Horst held in high esteem (11) - on cathartic drugs and then access Horst's contribution to the controversy.

Drug action according to Galen and Fernel

"The nature of man" of the Hippocratic Corpus had already dealt with the action of cathartic drugs, drawing an analogy between seed and humours. For nourishment, seed draws from the

earth first what corresponds closest to its nature. Accordingly, a purgative attracts and evacuates the humour closest to its own nature before removing other humours (12).

Galen elaborated a theoretical structure for the classification of drug action. He stated that purgatives belonged to the group of drugs which acted by "similitude of the whole substance"(13). This "familiarity" or close relationship of the mixture between humour and drug supposedly led to the drug action resembling the attraction of the magnet for iron (14). Accordingly, a specific purgative would attract a specific humour and expel it from the body (15).

The other principle of drug action according to Galen derived from the principle contraria contrariis (16).

Galen distinguished primary, secondary and tertiary qualities (or faculties) of drugs. The primary qualities are the elementary qualities hot, cold, moist and dry (17). Secondary qualities arise from different mixtures of the first qualities, leading to a relaxing, contracting, hardening, rarefying or solidifying effect (18). Tertiary qualities are primary or secondary qualities which have a special effect on, or lead to, a specific reaction of one part of the body (19). If the balance of the humours which constitutes health is disturbed in one direction, a remedy with the opposite quality is necessary. An excess of the hot quality, for example, leads to a fever. Therefore a remedy with the opposite or cold quality is indicated in order to restore health. Drugs supposedly acted by transmitting qualities into the body or replacing one quality with another (20).

Galen's doctrine of specific cathartics remained valid until the Renaissance : "As long as classical humoral pathology was basic to medicine, the doctrine of specific cathartics remained fundamental, too. The existence of specific cathartics, though not accepted by all physicians of all times, yet presented something of a dogma in the sixteenth century, and certain drugs were well-known for their specific action" (21).

Contrary to Galen, occult qualities were often described during the Middle Ages as tertiary qualities (22). Fernel used the terms "tertiary quality" and "occult quality" in order to describe drug actions which could not be derived from qualities accessible to the senses. Therefore, these drug actions had to be traced by observation of the effects they induced.

According to Fernel, the occult qualities of cathartics resulted from a "similitude of the whole substance" originating from an active inner principle, higher in rankthan qualities and matter, the "form" (23). Fernel proposed the following mode of action : a magnet is active whenever in the vicinity of iron, but a specific cathartic is activated during its digestion with the help of the internal heat. While its substance remains in the stomach or intestines, the drug gives rise to an acrimonious vapour. This vapour spreads to all parts of the body through invisible ducts and thus reaches the noxious humour. By its acrimony, the vapour cuts up the humour. By its adverse quality it also strongly stimulates the containing part and provokes it to discharge the noxious humour. The local action of the vapour and the attractive action on the part of the substance of the drug together force the humour to descend to the stomach. So drug and humour are expelled after exciting the discharging faculty of the intestines (24).

Horst's discussion

Horst's own intention in examining the opinions of ancient and contemporary writers is, as he himself states, to provide a better exposition of the truth (25). He addresses three central points of discussion : is there a direct drug effect on the specific humour ? How to deal with assertions that attraction is not the decisive

mode of action ? How can the drug effects be traced back to the characteristics of the drug, in other words, how to explain the drug effects in terms of qualities, temperament and form ?

Addressing the first question, Horst accepts the doctrine in the Hippocratic Corpus that specific cathartics do exist, drugs which eliminate a specific humour from the body. Therefore he rejects the Alexandrian doctor Erasistratos (c. 330-255 BC), known to him through Galen, who opposed the doctrine of specific cathartics. According to Erasistratos, the degree of fluidity is essential : a purgative evacuates every humour, starting with the most fluid and gradually moving to the more solid ones. Horst concedes only that the more fluid parts of a specific humour will be evacuated first because they can be removed from the body more easily (26).

Furthermore, Horst affirms a direct action of a drug on the humours. However, he does not dismiss the contrary opinion of the Bologna professor Girolamo Cardano (1501 - c.1576) entirely. Cardano had maintained that all action stems from a living body. The drug itself does not attract the humour directly but it affects the gastrointestinal tract which then attracts the humour. Horst argues that the magnet which attracts iron does not live. An influence of the drug on the intestines, however, supporting the evacuation of the noxious humour, is acceptable (27).

According to the *Problemata Aristotelis,* a swallowed purgative is dispersed within the body, liquifies noxious humours, and pulls these humours along, thereby purifying the blood. Horst judges this statement correct but insufficient, because this theory does not explain why a purgative purges one corrupt humour better than another and why it purges one part of the body better than another (28).

The assumption that attraction of humours is the central drug effect, had already been challenged in antiquity by Asclepiades, a physician in Rome in the 1st century BC. Asclepiades maintained that a drug could change the nature of a humour according to its own nature. A cholagogue for example supposedly created yellow bile within the body and then purged it, a mechanism different from attraction. Horst rejects this referring to his own experience (29).

In Renaissance medicine Joubert and Joseph Duchesne alias Quercetanus (1549-1609) had argued against attraction as the leading principle of purgation. Joubert, on the one hand, relied mainly on the expelling faculty of the body, and stressed contributory antipathy between drug and humour (30). According to Joubert, irritation of the expelling faculty - one of the natural faculties with which, according to Galen, all parts of the body are endowed - combined with antipathy between drug and humour leads to the evacuation from the body (31). His argumentation remains basically Galenist. Duchesne, on the other hand, is arguing for the Paracelsian camp. According to Paracelsism, not the elements but three chemical principles salt, sulphur and mercury are responsible for actions in nature and for the effect of drugs. Duchesne postulated a direct influence of the drug on the body. Salinic spirits of a purgative supposedly irritate the good-natured spirits of the body and stimulate them to excrete the humours. It is difficult for Horst to argue against these two positions. He asks - and thereby implicitly judges this mode of action unlikely - how a humour from the remotest parts of the body, far away from the intestines, could be forced into them by antipathy. Against the view that a suitable purgative taken in would attract such a humour, Joubert would not easily show that a purgative pushed a humour a long way into the intestines by means of antipathy. From all modes of action offered and all arguments Joubert can provide, the activation of the expelling faculty of the remote body parts would, according to Horst, play the main role in this regard (32).

This comes close to the mode of action Duchesne proposes. In short, Horstdoes not reject the notion of antipathy entirely, but he would not be in line with Joubert. Instead of an antipathy between drug and humour, Horst maintains an antipathy between the drug and the part of the body where the noxious humour sits. Through its antipathy the drug activates the expelling faculty of this body part, which contributes to force the humour into the intestines.

Now Horst turns to the main cause for catharsis. Whereas the properties of many drugs are explained today by their molecular structure and their interaction with cell surfaces and receptors, Galenist authors searched for explanations within traditional theoretical pharmacology. So different authors attributed properties of cathartic drugs to the manifest primary and secondary as well as to occult qualities. As far as the primary qualities are concerned, Horst cites the analogy between the sun and a drug. Accordingly, the hot quality of a drug would be responsible for evacuation just like the sun attracting moisture from the ground. However, attraction of moisture is, contrary to purgation, indiscriminate. Therefore Horst concludes that the hot quality of a drug only supports purgation (33).

The same is true for attributes originating from a specific mixture of the qualities. Francisco Valles (1524-1592), personal physician of the Spanish king Philipp II (1527-1598), had suggested that, in combination with the hot quality, characteristics such as colour, consistence or friability were responsible for the cathartic effect. Horst argues, that these characteristics, however, can be changed by decoction, extraction or infusion, whereby the strength of the drug remains (34). He agrees with the Luneburg town physician Tobias Dorncreilius (1571 -1605) that a higher degree of acrimony and tenuity does not necessarily indicate the greater strength of a purgative (35). However, the tenuity and acrimony or bitterness of a drug adds to its effect (36).

So the main effect is left to the "occult qualities" and "similitude of substance". Here, Horst combines the theories of Mesue (37) and his commentators Mundinus (c.1270 - 1326) and Johannes Costaeus (d. 1603) with those of Fernel and Gabriele Falloppio (1523-1562). The occult quality comes from heaven, as stated by Mesue and his commentators. Vigour from heaven, transferred to the forms, gives the drug the power to purge. The mixture of the drug serves the form in orderto fulfill its tasks (38). The mode of action then is essentially the same as described by Fernel : a purgative is agitated by the inner heat and resolved, disperses vapours and spirits, attracts humours and separates them from others. The discharging faculty of the body is excited and throws out the drug and the noxious humour (39).

Contrary to Fernel, Falloppio maintains that "similitude of substance" does not lie in the form but in the temperament, coming forth from the mixture of the primary (elementary) qualities. This temperament is similiarto the temperament of the noxious humour. The form determines how something is mixed which leads to the specific characteristics of the drug. Horst sides neither with Falloppio nor with Fernel but maintains that both modes of action of the same drug are possible (40).

Conclusion

Horst provides a thorough look from the 17th century back to antiquity on the one hand, and to contemporary discussions on the other. Horst's remarks show how difficult the task to reconcile the views of some outstanding Galenists had become in the early 17th century. In order to explain the nature of occult qualities, Fernel adhered to a theory which was openly rejected by Falloppio, and Horst will not take sides between the two. Aside from the authority of Hippocrates and Galen, Horst does not have convincing arguments to dismiss the concept of antipathy between drug and humour in favour of

attraction. He tries to integrate antipathy by maintaining that an antipathy exists between drug and body, not between drug and humour. Paracelsian influences are accepted in a limited fashion and in such a way that they do not undermine the traditional framework. In short, Horst creates a complicated theory, nearly breaking under its own weight.

The rising divergence within traditional views without a revolutionary upheaval is part of the development of the theoretical structures within Galenism, which were neither static nor monolithic, but, on the aspect studied, creative and diverging. Horst's attempts of reconciliation are an example of the fragmentation of Renaissance Galenism already before the advent of the blood circulation which wrecked basic assumptions of Galenic physiology and therefore dealt a further blow to the authority of Galenism.

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Literature

Cardano Girolamo (1564), *Contradicentium Medicorum libri duo,* Parisiis, Apud Jocubum Macaeum.

Croll Oswald (1996), *Designaturisinternisrerum: die lateinische editio princeps (1609) und die deutsche Erstubersetzung (1623),* Wilhelm Kuhlmann and Joachim Telle, eds, Stuttgart, Steiner.

Dorncreilius Tobias (1604), *Dispensarium novum ... cui ... accessit eiusdem auctoris Tractatus De purgatione utilissimus,* Hamburgi, Ex Bibliphilo Frobeniano.

Duchesne Joseph (1605) *Ad veritatem Hermeticae medicinae ex Hippocratis etiam veterumque decretis, actherapeusi propugnandam, adversus cuiusdam Anonymi Phantasmata Responsio.* Frankfort, W. Richter ?

Falloppio Gabriele (1584), *Opera quae adhuc extant omnia, in unum congesta,* Francofurti, Apud haeredes Andreae Wecheli.

Fernel Jean (1668), *Universa medicina,* Genevae, apud Samuelem de Tovrnes.

Galen (1821 -1833), *Opera omnia,* Carl Gottlob Kuehn, ed, Officina Libraria Car. Cnoblochii, Lipsiae, 20 vols.

Hippocrates (1979), *Oeuvres completes d'Hippocrate,* E. Littre, ed, 10 vols, Paris 1839-1861, reprint Amsterdam, Adolf M. Hakkert.

Horst Gregor (1666), *Operum medicorum tomus primus ... cura Gregorii Horstii Junioris,* Gouda, Gulielmi vander Hoeve.

Joubert Laurent (1566), *Paradoxorum decas Prima atque altera,* Lugduni, Ad Salamandrae.

Mesue (1589), *Opera demedicamentorumpurgantium delectu, castigatione, et usu libri duo. ... Cum Mundini, Honesti, Manardi, etSylviiin trespriores libros observationibus ... Atque item loannis Costaei Annotationes,* Venetiis, Juntae.

Pseudo-Aristoteles (1550), *Problematum Aristotelis Sectiones duadequadraginta. Problematum Alexandri Aphrodisei Libri Duo,* Theodora Gaza interprete, Lugduni, Apud Paulum Mirallietum.

Valles Francisco (1556), *Controversiarum medicarum et philosophicarum libri decern,* Compluti, ex officina loannis Brocarii.

Benedum Jost; Giese Christian (1983), *Die Professoren derMedizin in derGiessenerGemaldegalerie,* Giessen, Wilhelm Schmitz.

Berthe G. (1909), *Historique de la Purgation,* doctoral thesis, Paris.

Blum Paul Richard (1992), Qualitates occultae : Zur philosphischen Vorgeschichte eines Schlusselbegriffs zwischen Okkultismus und Wissenschaft, August Buck, ed, *Die okkulten Wissenschaften in derRenaissance,* Wiesbaden, Harrassowitz, pp. 45-64.

Buck August, ed (1992), *Die okkulten Wissenschaften in der Renaissance,* Wiesbaden, Harrassowitz, pp. 45-64.

Eisenreich Ulf (1997), *Die «contagiosen» Krankheiten im Werk des Gregor Horstius,* doctoral thesis, Giessen University.

Gurlt E.; Wernich A.; Hirsch August, eds (1929-1934), *Biographisches Lexikon der hervorragenden*

Arzte alter Zeiten und Volker, 5 vols, 2nd edition, Berlin, Vienna, Urban and Schwarzenberg.

Harig Georg, (1974) *Die Bestimmung der Intensitat im medizinischen System Galens,* Berlin, Akademie-Verlag.

Hutchinson Keith (1983), Supernaturalism and the mechanical philosophy, *Hist. Sci.,* 21, pp. 297-333.

Hutchinson Keith (1982), What happenend to occult qualities in the Scientific Revolution ? *Isis,* 73, pp. 233-53.

Lieberknecht Sieglinde (1995), *Die Canones des Pseudo-Mesue. Eine mittelalterliche Purgantien-Lehre,* Stuttgart, Wissenschaftliche Verlagsgesellschaft.

Meinel Christoph (1992), Okkulte und exakte Wissenschaften, August Buck, ed, *Die okkulten Wissenschaften in der Renaissance,* Wiesbaden, Harrassowitz, pp. 21-43.

Schlogl Rudolf (1993), Ansatze zu einer Sozialgeschichte des Paracelsismus im 17. und 18. Jahrhundert, Peter Dilg, Hartmut Rudolph, eds, *Resultate und Desiderate der Paracelsus-Forschung,* Stuttgart, Steiner, pp. 145-62.

SchuchardtOrtwin (1994), *Anima rationalis und hohere Sinnesfunktionen. Theorien des «deutschen Askulap» Gregor Horstius,* doctoral thesis, Giessen University.

Schweikardt Christoph (1995), *Theoretische Grundlagen galenistischer Therapie im Werk des GieBener Arztes und Professors Gregor Horst (1538-1636). Ein Vergleichzu Jean Fernel (1497-1558), dem Leibarzt des franzosischen Konigs Heinrich II.,* doctoral thesis, Giessen University.

Siegel Rudolph E. (1968), *Galen's System of Physiology and Medicine,* Basel, Karger.

Temkin Owsei (1972), Fernel, Joubert and Erastus on the specifity of cathartic drugs, Allen G. Debus, ed, *Science, medicine and society in the Renaissance,* London, Heinemann, pp. 61-68.

Wilhelm Isabel (1994), *Krankheiten von Gehirn und Sinnesorganen in Kasuistiken des GieBener Arztes und Professors Gregor Horstius (1578-1636),* doctoral thesis, Giessen University.

Wear Andrew (1995), Early Modern Europe, 1500-1700, Lawrence I. Conrad, Michael Neve, Vivian Nutton, Roy Porter, Andrew Wear, *The Western Medical Tradition 800 BC to AD 1800,* Cambridge, Cambridge University Press., pp. 215-361.

Notes

1. On qualities, see R. Siegel, *Galen's System of Physiology and Medicine,* Basel, Karger, 1968, p.141, pp. 145-151, and G. Harig, *Die Bestimmung der Intensitat im medizinischen System Galens,* Berlin, Akademie-Verlag, 1974, pp. 105-114.
2. Siegel, op.cit., note 1 above, p. 147.
3. On purgatives in the Middle Ages, see S. Lieberknecht, *Die Canones des Pseudo-Mesue. Eine mittelalterliche Purgantien-Lehre,* Stuttgart, Wissenschaftliche Verlagsgesellschaft, 1995.
4. G. Berthe, *Historique de la Purgation,* doctoral thesis, Paris 1909, pp. 111-29.
5. J. Benedum, C. Giese, *Die Professoren der Medizin in der Giessener Gemaldegalerie,* Giessen, Wilhelm Schmitz, 1983, pp. 5-16, provide a short biography.
6. See the doctoral theses on Gregor Horst : U. Eisenreich, *Die «contagiosen» Krankheiten im Werk des Gregor Horstius,* doctoral thesis, Giessen University, 1997; O. Schuchardt, *Anima rationalis und hohere Sinnesfunktionen. Theorien des «deutschen Askulap» Gregor Horstius,* doctoral thesis, Giessen University, 1994; C. Schweikardt, *Theoretische Grundlagen galenistischer Therapie im Werk des GieBener Arztes und Professors Gregor Horst (1578-1636). Ein Vergleich zu Jean Fernel (1497-1558), dem Leibarzt des franzosischen Konigs Heinrich II.,* doctoral thesis, Giessen University, 1995; I. Wilhelm, *Krankheiten von Gehirn und Sinnesorganen in Kasuistiken des GieBener Arztes und Professors Gregor Horstius (1578-1636),* doctoral thesis, Giessen University, 1994.
7. E. Gurlt, A. Wernich, A. Hirsch, eds, *Biographisches Lexikon der hervorragenden Arzte alter zeiten und Volker,* 5 vols, 2nd edition, Berlin, Vienna, Urban and Schwarzenberg, 1929-1934, vol.2, p. 304.
8. O. Temkin, Fernel, Joubert and Erastus on the specifity of cathartic drugs, Allen G. Debus, ed, *Science, medicine and society in the Renaissance,* London, Heinemann, 1972, pp. 61-68.
9. A. Wear, Early Modern Europe, 1500-1700, pp.215-361, here pp.317f., L. Conrad, M. Neve, V. Nutton, R. Porter, A. Wear, *The Western Medical Tradition, 800 BC to AD 1800.* Cambridge, Cambridge Unviersity Press, 1995. R. Schlogl, Ansatze zu einer Sozialgeschichte des Paracelsismus im 17. und 18. Jahrhundert, P.

Dilg. H. Rudolph, eds, *Resultate undDesiderate der Paracelsus-Forschung,* Stuttgart, Steiner 1993, pp. 145-62, pp.152f. O. Croll, *Designaturis internis rerum : die lateinische editio princeps (1609) und die deutsche Erstubersetzung (1623),* W. Kuhlmann & J. Telle, eds, Stuttgart, Steiner, 1996, pp.6-9.

10. G. Horst, *Operum medicorum tomus primus... cura Gregorii Horstii Junioris,* Gouda, Gulielmi vander Hoeve, 1666, p. 3 : «Haec est vera medicinae constitute, quam ob causam vehementer lapsi sunt olim Empirici & Methodici... Hodie duas hasce sectas una Pseudo-Hermetica repraesentat, a Theophrasto Paracelso ducens originem, qui veterum medicorum placitis contemptis nova principia sibi excogitavit & ita novam sectam a vera Alchymistica, quam olim Avicenna, Rhases, Villavovanus & alii proposuerunt, & cum rationali Medicina conjunxerunt, diversam constituit. Verum cum eadem secta, quatenus cum Empiricis convenit, intempestiva Experientia peccet, prout autem cum Nethodicis [sic] affinitatem habet, insufficient! ratiocinationis discursu utatur, ideo eandem suis relinquimus tutoribus, & in verae Medicinae systemate constituto acquiescimus».
11. Horst called Fernel *Autor noster and* incorporated summaries on therapeutic principles, bloodletting and purgation - the first three books of Fernel's *Therapy* of the treatise *Universa medicina* - in his own work. Horst, op.cit, note 10 above, on therapeutic principles (De methodo medendi), pp. 330-32, on bloodletting pp. 340-43, on purgation pp. 358-62.
12. Hippocrates, On the Nature of Man, E. Littre, ed, *Oeuvres completes d'Hippocrate,* 10 vols, Paris 1839-1861, reprint Amsterdam, A. Hakkert, 1979, vol. 6, ch.6, pp. 44-47; Temkin, op.cit., note 8 above, p.61.
13. Galen, De simplicium medicamentorum temperamentibus ac facultatibus, book 8, ch. 25, C.G. Kuehn, ed, *Opera omnia,* Officina Libraria Car. Cnoblochii, Lipsiae, 20 vols, 1821 -1833, vol. 11, pp. 613f.
14. Temkin, op.cit., note 8 above, p. 61.
15. Galen, op.cit., note 13 above, book 8, ch. 25-26, pp. 611-15, and book5, ch.17, pp. 760f. Temkin, op.cit., note 8 above, p. 61.
16. Harig, op.cit., note 1 above, p. 110.
17. Harig, op.cit., note 1 above, pp. 106f.
18. Harig, op.cit., note 1 above, p. 111.
19. Harig, op.cit., note 1 above, p. 112.
20. Siegel, op.cit., note 1 above, p. 150.
21. Temkin, op.cit., note 8 above, p. 61.
22. Harig, op.cit., note 1 above, p. 114. He stresses the difference between Galen's definition of tertiary qualities and medieval tertiary qualities. On «occult qualities", see the papers in August Buck, ed, *Die okkulten Wissenschaften in der Renaissance,* Wiesbaden, Harrassowitz, 1992, especially C. Meinel, Okkulte und exakte Wissenschaften, pp. 21-43, and P. Blum, Qualitates occultae : Zur philosophischen Vorgeschichte eines Schlusselbegriffs zwischen Okkultismus und Wissenschaft, pp. 45-64. See also K. Hutchinson, What happenened to occult qualities in the Scientific Revolution ? *Isis,* 1982, 73, pp. 233-53, idem, Supernaturalism and the mechanical philosophy, *Hist. Sci.,* 1983, 21, pp. 297-333.
23. J. Fernel, Therapeutices universalis, *Universa medicina,* Genevae, apud Samuelem de Tovrnes, 1668, book3, ch.3, pp. 211f., book4, ch. 5, p.226, p. 229.
24. Fernel, op.cit., note 23 above, Therapeutices universalis, book 3, ch. 6, p. 213. Temkin, op.cit., note 8 above, p.62.
25. Horst, op.cit., note 10 above, p. 362 : «Cum statim ab initio autor noster hanc quaestionem attingat, omnino necessarium est, ut eandem hie etiam plurimum repetamus, ubi diversae quorundam tarn veterum quam recentiorum opiniones examinandae sese offerunt, de quibus agemus paucis, ut Veritas eo magis patefiat».
26. Ibid. p. 362 : «Inter veteres Erasistratus, quod habet Galenus in lib. de facult. med. pur. cap. 2.et 3. statuebat, purgans medicamentum aequaliter omne genus humorum evacuare, ita ut emulgeat humorem tenuiorem, quo moto pro ratione crassitiei sequantur alii ... Verum hanc assertionem tribus modis recte noster Autor infringit...» Galen, op.cit., note 13 above, De purgantium medicamentorum facultate, ch. 1, pp. 324-28.
27. Horst, op.cit., note 10 above, p. 363 : «Cardanus de subtilit. et lib. 2 contr. tr. 1 contr. 3 novum figmentum de purgatione proponit, dum statuit omnemattractionem, quae fit ratione similitudinis substantiae, fieri a corpore vivente qua de causa concludit, pharmacum facere quidem ad attractionem humorum, sed non immediate, verum mediate, quatenus primum nova qualitate

ventriculum et intestina afficit, quae affecta tali qualitate peccantes humores trahunt, adeoque tractio ipsi fit a partibus viventibus... Verum hanc assertionem non immerito impugnat Fallopius, utpote cum primum fundamentum infirmum sit, quatenus omnis tractio non a vivente tantum proficiscitur, quemadmodum magnes etferrum... confirmant...» G. Cardano, *Contradicentium Medicorum libri duo,* Parisiis, Apud Jacobum Macaeum, 1564, p. 9a.

28. Horst, De purgatione, op.cit., note 10 above, p. 362 : «Porro tertio loco perpendenda est opinio Aristotelis, qui in 1. sect, probl. num. 40 et seq. statuit, pharmacum habere talem naturam, ut non possit a calore nostri corporis concoqui, possit tamen attenuari et per universum corpus eliquare illud ipsum, quicquid est excrementitium, adeoque omnes humores agitare, quo facto retrocedens per easdem vias secum trahere, quos liquavit humores excrementitios, adeoque sanguinem purificare. Etsi vero recte dicantur haec omnia a Philosopho, non tamen sufficienter, propterea quod hinc ratio reddi nequeat, cur hie vel ille peccans humor prae caeteris hac vel ilia regione magis expellatur...» *Problematum Aristotelis Sectiones duadequadraginta. Probematum Alexandri Aphrodisei Libri Duo,* Theodoro Gaza interprete, lugduni, Apud Paulum Mirallietum, 1550, p.21.
29. Horst, op.cit., note 10 above, p. 362 : «Altera opinio est Asclepiadis, quam etiam Galenus passim refert, nimirum voluisse Asclepiadem Medicum, quod Medicamentum purgans evacuet determinate humores praeter naturam, verbi gratiacholagogumeducatbilem; non autem quasi talis in corpore fuerit, sed quatenus medicamentum quemlibet humorem in sui naturam converteret, unde ex medicamento purgante non tantum sequeretur purgatio, sed etiam generatio determinati humoris. At vero quanquam negare non possimus, ipsum medicamentum actuatum separare et attrahere peccantem humorem, falsum tamen, illud ipsum tantae activitatis statuere, quo totaliter eundem mutare queat, id quod aperte satis experientia confirmat».
30. Temkin, op.cit., note 8 abore, p.64.
31. On Joubert, Ibid, pp. 62-4.
32. Horst, op.cit., note 10above, p. 363: «... itaetiam non facile monstrari potest a louberto, quomodo purgantia per antipatheiam ex venis & remotissimis partibus humores fugent, unde confiteri cogitur, maxime partium expultricem hie agere, quatenus a medicamento irritatur... Non admodum ab opinione louberti quorundam Hermeticorum assertio abludit, quemadmodum apuc Quercet. lib. II. defens. Herm. Med. cap. 7. ubi virtus purgatrix salinis spiritibus tribuitur, ita tamen, ut vis ilia non tantum in sale purgantium, quatenus simpliciter sal est, statuatur, sed quatenus amaritudo salis stipatur irritante quodam spiritu, cuius vi atque energia eiusmodi f unctiones obeantur. Siquidem (inquit Quercetanus) cum spiritus spiritibus facile connectantur, vitales expultricis nostrae facultatis spiritus facile a spiritibus salis provcantur ad eorum excretionem, a quibus irritantur. Salinos enim spiritus mordaces & acres benigni nostri spiritus fere nequeunt, quin illos tota vi commoti & irritati excludant, quibus expulsis pacati conquiescant etc. at parta victoria, inquit, cum hostibus perturbatis varia etiam pravorum humorum sarcina simul liberata est, quorum expulsio fere [sic, in Quercetanus original: vere] purgatio dicitur. Manifestum igitur, quod hie purgans medicamentum non aliter quam per antipatheiam agat..." ibidem, p.364 : Nee omnino rejiciendum, quod habet loubertus, opinione VL, per antipatheiam purgationem fieri, quatenus proprie dictum pharmacum naturae nostrae repugnat, adeo purgatio nonquam fiat, quin propter antipatheiam illam vis expultrix extimulata ad expellendum irritetur, quod vel maxime patet Opinione VII. dum salini spiritus nobis inimici purgationem peragere dicuntur... « L. Joubert, *Paradoxorum decas Prima atque altera,* Lugduni, Ad Salamandrae, 1566, p. 494. J. Duchesne, *Ad veritatem Hermeticae medicinae ex Hippocratis etiam veterumque decretis, ac therapeusi propugnandam, adversus cuiusdam anonymi Phantasmata Responsio,* (Frankfort, W. Richter?, 1605), p.61, pp.63f.
33. Horst, op.cit., note 10 above, p.362 : Sunt qui calori medicamenti vim attrahendi noxios humores attribuere conati sint: cum enim vidissent solem satis evidenter ex aquis et terris solius caloris beneficio ingentem exhalationem copiam attrahere... Quamquam vero negare non poBimus... calorem adjuvare purgatricem qualitatem medicamenti, longe tamen alia est attractionis ratio praedictarum rerum, quam in purgantibus, quippe sol absque discrimine caloris vi vapores quacunque materia humida producit...».

34. Ibid, p. 362 : «Non autem hie sufficit Vallesii lib. 9. controvers. cap. I. auctarium, qui vi caloris attractionem succorum fieri decit, cum opinione praecedenti, sed addito, quod ilia tractio non aequaliter omnes, sed certos tantum humores respiciat propter similitudinem non in primis qualitatibus, sed in illis accidentibus, quae consequuntur substantiae modum, qui nascitur ex modo mixtionis, ut sunt color, crassities, tenuitas, friabilitas & tales aliae qualitates, quae sunt magis ex parte materiae. Non, inquam, rei difficultati satisfit, propterea quod haec operatio purgantium longe nobilior sit, quam ut a modo substantiae tali deduci queat, utpote qui mutari potest, vi purgatrice nihilominus remanente, quod infusionibus, extractionibus, decoctionibus et similibus apparet». F. Valles, *Controversiarum medicarum etphilosophicarum libri decern,* Compluti, exofficina loannis Brocarii, 1556, pp. 145f.
35. According to this theory, the degree of acrimony, bitterness and tenuity indicates the strength of a drug. Weak drugs only evacuate yellow bile, stronger ones phlegm, and the strongest also black bile. Horst. op.cit., note 10 above, p. 362 : «Non sequitur, quod monet Dorncreilius tr. de purg. cap. I. quod purgantia, quoacrioraettenuiora fuerint, eo quoque humores crassiores & in paribus remotiores existentes evacuent, ita ut pharmaca minus acria et amaritudine fere carentia bilem duntaxat flavam attrahant, his acriora et tenuiora prompte pituitam eliciant; succum vero melancholicum non nisi ilia, quae cum vehementi acredine insignem amaritudinem obtineant...» T. Dorncreilius, *Dispensarium novum... cui... accessit eiusdem auctoris Tractatus De purgatione utilissimus,* Hamburgi, Exbilbiophilo Frobeniano, 1604, p.120f.
36. Horst, op.cit.,note 10above, p. 364: «Imocaloris etiam in promovenda purgatione magnam activitatem esse non negamus... quatenus omnis vitalis actio, & per consequens etiam superfluorum excretio, caloris adjumento perficitur, inprimis ubi tenuitas substantiae, amarities, acrimonia & similia accedunt...»
37. On Mesue, see Lieberknecht, note 3 above, pp. 4-8.
38. Horst, op.cit., note 10 above, p. 363 : «Hanc occultam proprietatem agendi Mesues sub inst. canon Vnivers; theor. 1. a coelo medicamento communicatam statuit, ita tamen, quod monet Mondinus, inaddition., utcomplexiositprincipium praeparativum deserviens specificae formae, quoad illam operationem : ad hoc facillime cum Hippocr. assertione conciliatur, quatenus de Mesue, ut inquit Costaeus in additioni. ad hunc locum, non estadmirandum, quod medicamentum quatenus tale, id est formae gratia, quae profecto rei cuique largitur, ut hoc ipsum sit, quod quaeque est &coelestivi, quae impartiturformas,purgandi vires obtinere medicamenta profitetur». Mesue, *Opera de medicamentorum purgantium delectu, castigatione, et usu libri duo... Cum Mundini, Honesti, Manardi, et Sylvii in tres priores libros observationibus... Atque item loannis Costaei Annotationes,* Venetiis, Juntae, 1589, pp1 bf., 3a.
39. Horst, op.cit., note 10 above, p. 363f.: «Est enim occulta proprietas nihil aliud, quam similitudo substantiae, qua medicamentum cum humore expurgando convenit, cujus ratione medicamentum agit & humor patitur, illudque sibi familiarem succum trahit, hinc vero trahenti pharmaco cedit, quod fit ea ratione, quatenus medicamentum purgans a calorenativoactuatur, cujus resoluti vapores et spiritus in totum corpus disperguntur, qui postea vi appropriata totius substantiae sibi familiares humores attrahunt & a reliquis separant, ubi natura tarn a noxiis humoribus, quam ipsius medicamenti qualitatibus alienis extimulata facultatem expultricem excitat, ut una cum medicamento purgante simul etiam peccantem humorem expellat».
40. Ibid, p. 364: «Fallopius de simpl. cap. 4 ejusmodi similitudinem substantiae consistere dicit in natura quadam corporea, quae non sit ipsa forma, sed habeat tale temperamentum, quod parum distet atemperamento illius, quod attrahitur, qua ratione diversatrahendi principia uni eidem medicamento concedi possunt, quod sano sensu approbamus». G. Falloppio, *Opera quae adhuc extant omnia, in unum congesta,* Francofurti, Apud haeredes Andreae Wecheli, 1584, pp. 32f. Seeing similitude of substance and form as equivalent for the explanation of drug action, as stated by Fernel, is rejected by Falloppio who criticizes Fernel by name.

Biography

Christoph Schweikardt obtained a medical doctorate at Giessen University in 1996 and a M.A. degree in History at Leiden university in 1997. Currently, he holds an assistant position at the Institut fur Geschichte der Medizin in Halle/Saale, Germany.