'FOR THE LIFE OF A CREATURE IS IN THE BLOOD' (*LEVITICUS* 17:11). SOME CONSIDERATIONS ON BLOOD AS THE SOURCE OF LIFE IN SIXTEENTH-CENTURY RELIGION AND MEDICINE AND THEIR INTERCONNECTIONS

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Summary

This article studies the different meanings of blood, focusing on the Early Modern period in which the unravelling of its secrets worked not only at a medical level, but also in relationship to philosophy and religion. My points of departure are the works of two sixteenth-century medical authors, the Dutchman Levinus Lemnius and the Italian Andrea Cesalpino. It is claimed that they were much more interested in physiology than in anatomy, and that only in that context can we fully appreciate the value of blood. Inspired by recent work on the role of blood in religious history, such as Caroline Walker Bynum's *Wonderful Blood,* I present blood as a substance that, due to its immense value, tended to lose its materiality and took on spiritual aspects, which made devotional interpretations inevitable. By exposing its non-corporeal aspects, the association with God, especially with the Holy Spirit and its terrestrial emanation, becomes evident. No matter how much they exploited not only Aristotle, but also Galen, the arguments of both Lemnius and Cesalpino had at their centre a spiritualisation of blood. In his extensive *regimina*, the more traditional Levinus Lemnius emphasised the *spiritus vitalis* that determined the quality of blood. At its most refined stage, it approached the *spiritus universalis*, and almost converged with the Holy Spirit. Likewise, the Aristotelian Cesalpino placed the heart and the spiritualised human fuel, blood, again and again at the centre, bringing everything back to its origin, God: the *deus rotator*.

In recent publications on the Early Modern period, anatomy has been at the centre of attention. The opening up of bodies during the Renaissance, which took place despite existing taboos or merely because of an urge to find material evidence for either medical complaints or religious miracles, has proved to be a fruitful subject of research from a medical-historical perspective. In this respect, the ingenuity of Andreas Vesalius' self-display still reverberates today. This self-acclaimed and, until now, widely-endorsed view that anatomy played the star role may explain the relative neglect of blood in medical-historical studies. The fact of the matter is that, until the seventeenth century when Harvey made his breakthrough

on its circulation, blood was a minor topic in elite western medicine.[1] Anatomical textbooks hardly dealt with the blood and, when they did, the authors mainly enlarged upon the spirits it carried through the body. This does not mean that blood was completely disregarded in premodern medical science and practice. Indeed, I would argue the reverse. But, in order to expose the value of blood for that period, medical historians should avoid the temptations of anatomy and study early modern physiology in combination with natural philosophy.

This is what Jean Fernel did in his *Physiologia* (1542), a survey that carefully discusses the generation and function of blood, as well as the different varieties of the liquid itself. In his comprehensive *Universa medicina* (1567), Fernel defined physiology as follows: 'So as the five parts of a complete medicine are set in order, physiology will be the first of all; it concerns itself with the nature of a wholly healthy human being, all the powers and functions'.[2] This statement shows that, during the sixteenth century, physiology was judged to be far more important than anatomy. Early modern anatomy investigated the parts of the body that are within reach of the senses. By exploring their structure, action and use, anatomists tried to answer the question of how they functioned, and in this way attempted to unravel the sources and secrets of life.[3] Physiology built on the results of anatomical research, but itself aimed higher, claiming to penetrate the nature of things. Its central principle was to establish why the body was constituted and functioned as it did. Its practitioners showed by logical demonstration how, as a branch of natural philosophy, it revealed not only the causal operations of the body, but also the causes of human nature. Of course, at this time anatomy and physiology were related, sometimes being practised by the same person. For this paper, however, it seems crucial to carefully distinguish between them and to concentrate on the latter.

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[1] Cunningham A. "The Principality of Blood: William Harvey, the Blood, and the Early Transfusion Experiments", in: Santing C. – Touber J. (eds.), *Blood Symbol Liquid* (Louvain: 2011) 193–205.

[2] Forrester J. tr/ann., *The Physiologia of Jean Fernel* (Philadelphia: 2003) 5.

[3] This means that present-day (experimental) physiology resembled what was then labelled anatomy. This confusion is carefully unravelled in Cunningham A., "The Pen and the Sword: Recovering the Disciplinary Identity of Physiology and Anatomy before 1800 I: Old Physiology – The Pen", *Studies in History and Philosophy of Science Part C. Studies in History and Philosophy of Biological and Biomedical Sciences* 33 (2002) 631–665 and idem, "The Pen and the Sword: Recovering the Disciplinary Identity of Physiology and Anatomy before 1800 II: Old Anatomy – The Sword", *Studies in History and Philosophy of Science Part C. Studies in History and Philosophy of Biological and Biomedical Sciences* 34 (2003) 51–76.

In this chapter, two sixteenth-century medical authors, Levinus Lemnius and Andrea Cesalpino, will be closely examined in order to highlight the value of blood in its various connotations for early modern medical doctors. While other doctors could have been selected, these two provide a useful combination: one doctor writing for the general public and living in Reformation Northern Europe, the other highly academically trained and practising in the service of the papal court. Both doctors were interested in anatomy and followed its findings, but appear not to have been anatomists themselves. Instead they pursued Fernel's line of argument and fully developed their physiological concepts in accordance with the foundations of natural philosophy.

In the analysis of their works, a third factor will be brought in, that of religion. Both authors not only lived in an era of great religious upheaval, but were also intensely devout and as such heavily engaged with the developments of the Reformation and Counter-Reformation respectively. Although a canon in later life, the Dutch Levinus Lemnius was under suspicion of sympathy towards the Reformation; indeed, his works were eventually placed on the Spanish-Dutch index of forbidden books.[4] His name features in Piero Camporesi's book, *Il sugo della vita* (1984), which embraces all aspects of the liquid, blood.[5] Although presented in a disparate, at times chaotic, form, this brief and sketchy work already touches upon many of the ideas about blood explored by Caroline Walker Bynum and Miri Rubin, to which I shall return shortly. The title is almost untranslatable, since its English translation, *Juice of Life*, clearly pales before the original. Camporesi referred to blood as eternally moving and simmering, hailing it as the treasury of human life, just as is the case with the most common (red) sauce in the Italian kitchen, *sugo bolognese*, the product of Camporesi's hometown of Bologna. The book usefully develops the positive, not to say nutritious, wholesome and hearty reminiscences of blood, not only in the lives of saints – which formed a priceless source for Camporesi – but also in many medical treatises, such as the comprehensive *Regimina* of Lemnius, which were even translated into Italian openly a few years after their publication. The second protagonist of this paper is the Italian medical professor, papal physician and devout Catholic, Andrea Cesalpino. He, rather than William Harvey, has been

[4] Reusch Fr.H., *Der Index der verbotenen Bücher ein Beitrag zur Kirchen- und Literaturgeschichte* (Bonn: 1883) I, 497.

[5] Camporesi P., *Il sugo della vita. Simbolismo e magia del sangue* (Milan: 1984).

claimed by some Italian authors as the discoverer of the circulation of blood,[6] a claim that has been refuted definitively by authors such as Walter Pagel and Jerome Bylebyl.[7] By focusing on Lemnius' and Cesalpino's views on blood, it will become apparent that there is a relationship between the traditional *homo sanguinicus* – so widely known from medieval and Renaissance medical *consilia* and *regimina* as well as from research on the heart and the circulation of blood by sixteenth-century anatomists – and the blood dripping from the body of the Crucified Jesus or Man of Sorrows celebrated in European art and devotional treatises dating from the same period as the works of Lemnius and Cesalpino.

While blood has been relatively neglected in medical history, there has been considerable recent enthusiasm for it in more mainstream historical publications. The precious liquid, however, is to be encountered overwhelmingly in the field of recent history of religion, notably in the history of its customs, practices and rituals. In the slipstream of the history of the body over the last twenty years, this field has seen an avalanche of publications on blood. Here it will suffice to mention Miri Rubin's *Corpus Christi. The Eucharist in Late Medieval Culture* and Caroline Walker Bynum's latest book *Wonderful Blood*, as they are the foremost protagonists of this line of approach, but of course there are many, many more.[8] Both authors played a pivotal role in the 'bodily turn' in the history of the church and theology. Rubin was one of the first to call the attention of cultural historians to the phenomenon of transubstantiation. According to this thirteenth-century church doctrine, all of Christ, both body and blood, was transubstantiated in the consecrated wine and bread. Walker Bynum's book represents a slight shift of orientation for this prolific author. She supplemented her usual corporal concerns with scrutiny of a far less tangible substance: Holy Blood and its veneration. Many of her assertions yield fruitful insights for medical historians and will therefore be used here to draw attention to

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[6] Archieri J.P., *The Circulation of Blood and Andrea Cesalpino of Arezzo* (New York: s.a.) and Piccini S., *Andrea Cesalpino scopritore, William Harvey promulgatore della circolazione sanguigna* (Milan: 1963).

[7] Pagel W., *William Harvey's Biological Ideas* (New York: 1967), esp. 169–209 and idem, "The Claim of Cesalpino and the First and Second Editions of his Peripatetic Questions", *History of Science* 13 (1975) 130–138; Bylebyl J.J., "Cesalpino and Harvey on Portal Circulation" in Debus A. (ed.), *Science, Medicine and Society in the Renaissance* (New York: 1973) I, 39–52 and idem, "Nutrition, Quantification and Circulation", *Bulletin of the History of Medicine* 51 (1977) 369–385.

[8] Rubin M., *Corpus Christi. The Eucharist in Late Medieval Culture* (Cambridge: 1991); Bildhauer B., *Medieval Blood* (Cardiff: 2006) and Walker Bynum C., *Wonderful Blood. Theology and Practice in Late Medieval Northern Germany and Beyond* (Philadelphia PA: 2007).

certain aspects of sixteenth-century medical views on blood. Much of *Wonderful Blood* is dedicated to how, why and when blood became a pre-eminent subject in Northern European art. The concern with the blood of Christ and its equivalents in other human bodies, and even in mammals, also provided an opportunity to explore what were then considered to be crucial philosophical and religious issues, which Walker Bynum explores. She shows that the precious liquid provided a focus for intense debate about the nature of matter, humanity, God and the entire universe. Since medical doctors and other authors shared a common ground of culturally agreed assumptions, a similar fascination with blood can be found in medical publications of that time, where medical and religious reasoning are amalgamated in exploring the numerous different notions and connotations of blood.[9] In addition to the traditional medical authorities, writers quoted freely from biblical, hagiographical and literary sources and almost united these into one single perspective. In his *Anatomical Renaissance*, Andrew Cunningham proposed studying the sixteenth-century enterprise of investigating nature in precisely these terms, considering that 'nature' was religiously steered and understood. In the present article, too, I work from the assumption that in the sixteenth century there was no fundamental divide between science and religion.[10]

Walker Bynum's observations compel us to look differently at the publications by sixteenth-century medical doctors.[11] To begin with, she contests the idea that, in the Late Middle Ages and the Renaissance, the connotations of blood were principally negative: suffering, mutilation of the body and violence, all manifestations which carry undertones of death.[12] Looking at the many images of blood piety, such as the Masses of Saint Gregory or the many *Men of Sorrows* which were tremendously popular in this period, it is clear that blood emerges as streaming, flowing

[9] Siraisi N.G., "Life Sciences and Medicine in the Renaissance World" in Grafton A. (ed.), *Rome Reborn. The Vatican Library & Renaissance Culture* (Washington: 1993) 169–198 and idem, "Signs and Evidence: Autopsy and Sanctity in Late Sixteenth-Century Italy" in Siraisi N.G. (ed.), *Medicine and the Italian Universities, 1250–1600* (Leiden: 2001) 356–380.

[10] Cunningham A., *The Anatomical Renaissance. The Resurrection of the Anatomical Projects of the Ancients* (Aldershot: 1997). Valuable are also idem, "Sir Thomas Browne and his *Religio Medici*: Reason, Nature and Religion" in Grell O.P. – Cunningham A. (eds.), *Medicine and Religion in Seventeenth-Century England* (Aldershot: 1997) 12–55 and Helm J. – Winkelmann A. (eds.), *Religious Confessions and the Sciences in the Sixteenth Century* (Leiden: 2001).

[11] For this argument see Walker Bynum C., *Wonderful Blood*, the introduction, "A Frenzy for Blood" 1–23 and ch. vii "Living Blood Poured Out".

[12] Walker Bynum, *Wonderful Blood* 14–15.

or even welling up [Fig. 1]. It is not dried in clots, as would be expected in case of the depiction of the corpse. What we encounter in these images is *sanguis*, that is, living blood, rather than *cruor*, coagulating blood, to use the distinction that many authors preferred.[13] In images and in the scriptural renderings of many visions, Jesus is not dead. The wound in his side, created by the lance well before he breathed his last, bleeds copiously and usually functions as the central feature. This was interpreted as the 'opening up of Christ', which gave humanity access to the sacraments through the door of life, leading to the possibility of eternal life. Blood in its entirety functioned as the secret of life and as food for the human soul.

Walker Bynum's section on 'Blood as *sedes animae*' develops this reasoning.[14] The title refers to *Leviticus* 17.11, *Anima carnis in sanguine est* (For the life of a creature is in the blood). Here Walker Bynum discusses popular preaching texts, implying that blood was valued as the transporter and source of life. As a vehicle of the soul, blood was allegorically, symbolically and, I would like to add, also literally, fastened to spirit. Whereas in much discourse the body/blood contrast illustrates the opposition of body and soul, Walker Bynum's material shows that it is better to see the two as connected and bring them into harmony. This is what the Carthusian, Petrus Dorlandus († 1507), did in his devotional treatise *Viola animae*, very popular throughout the sixteenth century. A very special donation, a blood transfusion by Jesus to humankind, is described as follows:

> He wished to be wounded that he might repair our wound and poured out his blood that he might by grace revive to life those only half alive. For just as the life of all ensouled creatures is in the blood, so the life of the just person comes through the blood of Christ, which he therefore in compassionate generosity pours out from his body so that you can drink it with your mouth and slake your thirst from it in your heart.[15]

The story about an alleged blood transfusion given to the dying Pope Innocent VIII in 1492 recorded by the chronicler of scandals, Stefano Infessura, proves my point of blood being the pre-eminent life-giving potion in more than one sense. Three small boys are said to have donated their blood, resulting in their own demise and that of the Pope. While the annalist

[13] Walker Bynum, *Wonderful Blood* 17–18.
[14] Walker Bynum, *Wonderful Blood* 161–166.
[15] Walker Bynum, *Wonderful Blood* 163.

Fig. 1. Jacob van Oostsanen, *Man of Sorrows*, ca. 1520.

did not reveal the details of the transfusion, it seems likely this was by drinking the blood.[16]

Here, therefore, I will be discussing blood as the source and seat of life in its fullest sense. Following the line of reasoning used by both Cunningham and Walker Bynum, I will then show that it needs to be separated in some ways from the body. I will argue that historical, medical-historical and religious-historical studies on blood have understood the liquid rather too materially, too bodily and too literally. Since blood was deemed to be involved with the soul, a more holistic approach appears justified. This concurs with Cunningham's allegation that anatomy in the western tradition was essentially about the soul, a statement that prevails in early modern medicine as a whole.[17] According to premodern medical and theological discourses it carried spirit or spirits – with and without a capital S – through the body.

Bloud and spirite the treasure of lyfe[18]

Levinus Lemnius (1506–1568) studied in Louvain, practised in Zeeland and travelled to Italy as well as to London.[19] He was the author of lengthy medical works. Although they were originally written in Latin, their content was of a practical and advisory nature. With amazing speed, these voluminous publications were translated into the vernacular and remained in print in Italian, French, English and German until the end of the seventeenth century.[20] Evidently, many readers longed for substantial, but at the same time legible, information on how to procure and preserve health and happiness. It was precisely these qualities that made Lemnius' encyclopaedic works – which are densely packed with quotations from

[16] Infessura S., *Diario della città di Roma di Stefano Infessura scriba senato. Nuova edizione a cura di Oreste Tommasini* (Rome: 1890) 275–276.

[17] Cunningham, *Anatomical Renaissance*, esp. 196–197.

[18] Lemnius Levinus, *The touchstone of complexions. Expedient and profitable for all such as bee desirous and carefull of their bodily health. Contayning most ready tokens, whereby every one may perfectly try, and thorowly know, as well the exact state, habit, disposition, and institution of his body outwardly: as also the inclinations, affections, motions, and desires of his minde inwardly* (London, Jo. Streater and Humphrey Moseley: 1633) 86.

[19] Hoorn C.M. van, *Levinus Lemnius (1505/1568). Zestiende-eeuws Zeeuws geneesheer* (Amsterdam: 1978).

[20] On this phenomenon in England: Slack P., "Mirrors of Health and Treasures of Poor Men: The Uses of the Vernacular Medical Literature of Tudor England" in Webster Ch. (ed.), *Health, Medicine and Mortality in the Sixteenth Century* (Cambridge: 1979) 237–242.

ancient medical and literary authors as well as from the Bible and the church fathers – so attractive. His *De miraculis occultis naturae* (first edition, Antwerp 1559) considers the signs, sources and causes of the several wonders of nature. The book attempts to explain these by observation and reasoning but was aimed to demonstrate and glorify the vastness and perfection of God's Creation, with man as the summit, paying due tribute to the leading role of the soul. Tellingly, chapter xi is entitled 'The soul of man comes not from the parent's seed but is infused by God'.[21] It is not possible to define Lemnius' confessional views as either Catholic or Protestant. He was certainly critical towards the Mother Church, in particular criticising the veneration of saints, but in his works he stressed the centrality of Christ's blood shed for men, as represented in the Holy Sacrament. Taking the sacrament ensured that 'Christ is in us and we in him (. . . .). We are confident [. . .] that faith infused into us by the Spirit, prompts us'.[22] Lemnius' urge to decipher the wonders of God's creation is also apparent from his two works on vegetation in the Bible.[23]

For a treatise on the hidden forces of human existence, it is likely that the secret of life played a leading role here. Much attention is therefore paid to the significance of the various humours, especially to their role in the constitution of a human being. Although the soul is considered more important than the body, in the exhortation that teaches 'how to lead a life that shall be most excellent' the reader is told to take meticulous care of the body, since it is the house of the soul.[24] It is claimed that, in force and value, blood lies far above the other three humours, as long as it remains pure, clean and clear, of course. For example, Lemnius states that when it becomes too thick, people tend to become fierce, cruel,

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[21] English translation: 'The secret miracles of nature in four books. Learnedly and moderately treating of generation, and the parts thereof, the soul, and its immortality, of plants and living creatures, of diseases, their symptoms and cures, and many other rarities [. . .]: whereunto is added one book containing philosophical and prudential rules how man shall become excellent in all conditions, whether high or low, and lead his life with health of body and mind' (London, Jo. Streater and Humphrey Moseley: 1658) 22.

[22] Lemnius, *De miraculis occultis naturae* (Antwerp 1559), ch. xiv, esp. 56. Lemnius' religious views van Hoorn, *Lemnius* 55–56.

[23] *Herbarum atque arborum quae in Bibliis passim obviae sunt* (Antwerp, Gulielmus Simonis: 1564) and *Similitvdinvm ac parabolarvm, qvæ in bibliis ex herbis atque arboribus desumuntur, dilucida explicatio* (Antwerp, Guilelmus Simonis: 1568).

[24] Lemnius Levinus, *Secrets* chs. XXI and XXII, 332–335. There are parallels with Melanchthon; compare Helm J., "Religion and Medicine: Anatomical Education at Wittenberg and Ingolstadt" in Helm J. – Winkelmann A. (eds.), *Religious Confessions and the Sciences in the Sixteenth Century* (Leiden: 2001) 51–68, esp. 54–62 and Cunningham, *Anatomical Renaissance* 230–233.

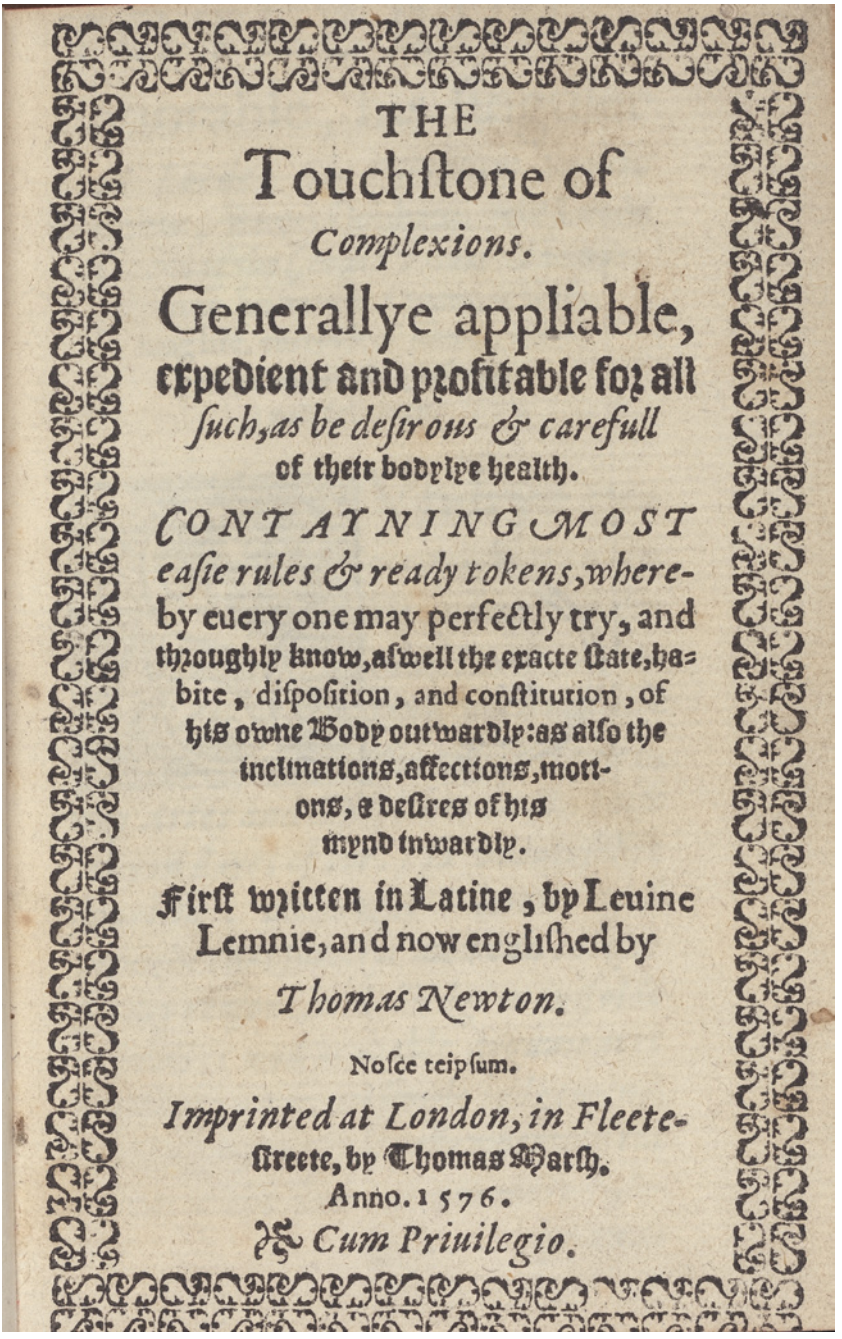
inhospitable and even inhumane. Such a quality of the blood was characteristic of those engaged in the rougher professions, such as musicians, potters, messengers, mariners and soldiers. Such people, he argues, held no regard for conscience and often little respect for religion. The thickness of their blood engendered 'grosse and troublesome spirits', which resulted in deficient principles, a darkened mind and many vices; indeed, even in godlessness.

When speaking of the sanguine constitution in general, the author points out that it combined the qualities of heat and moistness. This implied excellent health, especially in youth, when people are most full of blood. However, no matter how admirable this constitution, it could lead to frivolity and even result in licentious and thus inhumane behaviour. Sometimes sanguine temperaments could become excessively involved in physical activity, song, storytelling and other pleasures. Since the humours were seen as the causes of the passions, these delights had dangerous consequences. During these times of indulgence, the heart was prone to be affected, as the humours started to boil. The spirits in blood were especially likely to rise up and brim over. Consequently, the mind could become inflamed and produce either extreme joy or excessive anger. The latter condition, especially, was highly dangerous and in some cases resulted in death, with the blood withdrawing from and forsaking the heart, or choking the heart in its abundance.[25]

Lemnius' *De habitu et constitutione corporis* (1561) was likewise a best-seller in various countries. The work is in fact a very sophisticated *Regimen* directed towards a variety of medical professionals. It describes the best type of human being, explaining the humours, the elements, spirits, qualities and temperaments. In English, the book is called *The Touchstone of Complexions* and it was translated in 1576 by the London physician and poet, Thomas Newton [Fig. 2].[26] In this treatise, blood is also presented as a very special humour and hailed as the most excellent of the four.

What does Lemnius argue? The best type of human, he says, is one who meets the requirements of Polyclitus' *Canon*, a reference to the perfect sculpture of a man produced in the fifth century BC by the Greek Polyclitus. In his *De tuenda valetudine*, a very important source for Lemnius' work and quoted numerous times, Galen expanded on Polyclitus' ideas from a medical point of view by equating harmonious human

[25] Lemnius, *Secrets* 60–62.
[26] On Newton: van Hoorn, *Levinus Lemnius* 62, 310–311.


THE
Touchſtone of
Complexions.
Generallye appliable,
expedient and profitable for all
ſuch, as be deſirous & carefull
of their bodylye health.
CONTAYNING MOST
eaſie rules & ready tokens, where-
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his owne Body outwardly: as alſo the
inclinations, affections, mott-
ons, & deſires of his
mynd inwardly.
First written in Latine, by Leuine
Lemnie, and now engliſhed by
Thomas Newton.
Noſce teipſum.
Imprinted at London, in Fleete-
ſtreete, by Thomas Marſh.
Anno. 1576.
Cum Priuilegio.

Fig. 2. Title page of the English translation of Lemnius' *De habitu et constitutione corporis*, tr. Newton Thomas (London, Thomas Marsh: 1576).

proportions and splendour to a balance of the humours and temperament. Henceforth, beauty, health and happiness were on a par.[27] This is also Lemnius' conclusion. What he describes as the *Regula Polycleti* had to be followed, given that it was the touchstone for a congruent and proportionate distribution of humours and spirits in the human body, leading at the same time to soundness and perfection.[28] Here, it is not necessary to repeat Lemnius' ideas on the generation of the spirits and temperaments, as they are genuinely Galenic and thus familiar to us.[29]

Blood is considered to be extremely important here because it carried the spirits through the body. Lemnius makes these even more valuable by completing them with a fourth one, the *spiritus universalis* or Spirit of God, next to the Galenic *spiritus naturalis, vitalis and animalis.* This substance, he claims, mixes in the human body with the other spirits and makes man the true heir of God and his son. It was God's breath that had animated dead matter, and which was felt by every living creature from the most humble plant to man himself. For Lemnius, the construction of a fourth spirit allowed him to round off Galen's *Regula* and link the new list of four spirits, including one which was genuinely spiritual, with the four elements, four humours and four temperaments.[30] That fourth spirit was, of course, the principal one, which brought the others together into one harmonious whole and directed them in the execution of their function:

> For the heavenly Spirite, is the guyde and governor of the Spyrites of mans bodye, which are then more qualefyed, quieted, and kept under better order, when they be governed and ledde by the conducte and direction of this Spyrite. For if they once begin tumultuously to ruffle and styire by sedition wytin the bodye.

The book also explains, along traditional Galenic lines, that blood is produced in the liver, called 'the shoppe of the body', and transported by the veins. Part of it ran to the heart, which enriched the liquid with *spiritus vitalis.* This was the spirit that safeguarded the sensitive functions, and was particularly associated with blood and maintained its force and power. The perfected blood that resulted, together with the *calor nativus*

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[27] Santing C., "De menselijke canon: Het vraagstuk van de ideale mens in de Nederlandse medische wetenschap", *Bijdragen en Mededelingen voor de Geschiedenis der Nederlanden* 122 (2007) 484–502.

[28] Lemnius, *Touchstone* 33–34.

[29] For a general survey of the humours in relation to human temperaments: Arikha N., *Passions and Tempers. A History of the Humours* (New York: 2007).

[30] Lemnius, *Touchstone* 20–25.

or innate heat, was carried by the arteries through the whole body. The quality of this blood was determined by the degree of its mixture with the other three humours and the proportions of this concoction, as well as by food or by environmental influences such as climate, region and time of the year. While analysing the various human complexions, blood is praised as the most precious humour. Here, like most medical authors of that time, we should differentiate between blood as such – that is, the matter flowing through the arteries and veins of the human body – and blood as a distinct humour.[31] Lemnius also emphasises that the human blood which is discerned when a vein is opened contains all four humours. This is not to deny the fact that in the remainder of his argument he does not make such a strict distinction. Blood is considered most excellent, as it is supposed to bear the qualities of warmth and moistness. It is at its best in young people, as can be seen from their ruddy facial complexions. The excellence of the liquid was moreover demonstrated by its smooth taste, which he considered reminiscent of rice and milk. This concurs with the equation of blood and milk in devotional literature.

In order to determine the best type of human being, Lemnius deploys the notions of the *complexio* or *temperament*, bringing both terms into play. What is meant here is the balance of the qualities of hot, wet, cold and dry resulting from the mixture of elements in the human body that, in combination with the humours, was held responsible for physiological as well as psychological characteristics.[32] A hot and moist complexion was the best blend. As long as the blood was at its full strength and quality, the combination produced a sanguine person. Those with the purest sanguine *complexio* – Lemnius mentions as foremost examples, the Old Testament king David and the Spanish king Philip II, and makes a point of noting that Philip was also his lord – are considered to be the strongest, to have the healthiest colour, the benefit of the best balance as well as the most attractive appearance, and are mentally the most flexible. Young people or adolescents are the most typical sanguinics, but they run the risk of becoming too volatile. Growing older, although not too old, the *spiritus vitalis* becomes warmer, stronger and thus perfects a human being. By cherishing this temperament and training the accompanying strength of mind, the adult sanguinic could become rich in knowledge and experience

[31] Discussed in Arikha, *Passions and Tempers*.

[32] Siraisi N.G., *Medieval and Renaissance Medicine. An Introduction to Knowledge and Practice* (Chicago: 1990) 101–106. See for the tempers also Arikha, *Passions and Tempers*.

and achieve great wisdom. Remarkably, scarcely any attention is paid to the *spiritus animalis*, traditionally related to the brain and nerves. Instead, Lemnius concentrates on the *spiritus vitalis* that was added to the blood in the heart and, as a result, functioned as the 'fountain of life'. This is an argument for the tendency to spiritualise blood. The *spiritus vitalis* was seen to be transported by the (perfected) blood through the arteries and brought natural heat to the farthest extremities of the body. It nurtured the life force of every breathing creature. Again religious arguments are brought in, such as those from *Leviticus*. Moses' prohibition of the consumption of mammalian blood in *Leviticus* 17 is used to stress the importance of blood and to warn against its wastage. The warm arterial blood is supposed to feed life, just as the flame of a lamp burns more brightly when using good oil. A contrast is also made with the loss of blood, since it causes paleness and coldness, making it appear that the victim is dying. Blood, the conclusion goes, represents life, while loss of blood inevitably leads to death.

In his survey, Lemnius departs little from the thirteenth-century *Regimen sanitatis Salernitatum*, simply adding to it many medical, biblical and classical sources. Its verses concern dietary rules that give blood, and thus the sanguine *complexio*, a pivotal role in the life of mammals, especially of human beings, with the lines: *Consona sunt aer, sanguis, puericia verque* (Compatible are air, blood, youth and spring) and *largus, amans, hilaris, ridens, rubeique coloris, cantans, carnosus, satis audax atque benignus* (Generous, loving, joyful, merry, of ruddy complexion, singing, fleshy, rather daring, and friendly).[33] In addition to his appearance in many *regimina* and *practica*, the sanguinic is found extensively in courtly literature. In romances and love lyrics he is the rosy-cheeked, jovial young lover who eats red (sic!) cherries and is born under the sign of Venus and Jupiter. Sometimes he finds himself in trouble because of his volatility or his excessive sexual urges, as discussed above.[34] Nonetheless, the argument changes slightly here as, during the sixteenth century, the sanguinic of the Middle Ages was transformed into the ideal human being,

[33] Klibansky R. – Panofsky E. – Saxl F., *Saturn und Melancholie. Studien zur Geschichte der Naturphilosophie und Medizin, der Religion und der Kunst* (Frankfurt: 1992) 187; Burrow J.A., *Ages of Man. A Study in Medieval Writing and Thought* (Oxford: 1986) 18.

[34] Sears E., *The Ages of Man. Medieval Interpretations of the Life Cycle* (Princeton: 1986); Dove M., *The Perfect Age of Man's Life* (Cambridge: 1986); Burrow J.A., *Ages of Man*, in relation to the medical aspect, and Land K. van 't, "Een middeleeuwse James Bond: Een ideaal met schaduwkanten", *Geschiedenis Magazine* 43 (2008) 16–21.

a transformation that also brought along spiritualisation. Being already full-blooded and mature, he emerges as the resurrection of Polyclitus' and Galen's ancient *Canon,* but this time brought into a close relation with the resurrection of Christ, an event extensively discussed in Lemnius' works.[35] The description in his *Touchstone* echoes the criteria handed down from Antiquity, as we hear of the warm and smooth skin, comely stature, and even features such as rosy cheeks, auburn hair and a blond or red beard, as well as a perfect body shape.[36] To conclude, one could say that, by singing the praise of *homo sanguinicus*, the author repeated the theories of Galen and his medieval followers, but embedded these in a firm Christian framework. It is impossible here not to think of Jesus who, when crucified at the age of 32 and three months, was at the height of his capabilities in a physical as well as spiritual sense; in other words, a *homo sanguinicus*. This is clear, for example, in a painting by Lemnius' fellow countryman and contemporary, Maarten van Heemskerck [Fig. 3].

Blood and the heart

The Pisan and Roman professor Andrea Cesalpino (1525–1603) discussed the function of blood in several of his learned works. These publications were directed towards an audience of medical and professorial colleagues, but at the same time show the signs of his profound Catholic, Counter-Reformation beliefs. In this third section, I will demonstrate how both fields, medicine and theology, were conflated in his concept of blood.[37] Cesalpino was of Tuscan origin, studying medicine at the most important university of that region, Pisa.[38] During his student years there, the institution experienced a Golden Age of scholarly success thanks to the presence and work of famous medical doctors such as Guido Guidi (1500–1569), an eminent authority on Hippocrates and Galen and experienced

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[35] Lemnius, *Secrets* ch. xiv.

[36] Lemnius, *Touchstone* 90.

[37] Cesalpino's views are more elaborately discussed in my "*Deus rotator* and the Microrotator: Blood as the Source of Life in the Life and Works of Andrea Cesalpino" in Santing – Touber, *Blood Symbol Liquid* 137–155.

[38] Ferrari A. de, "Cesalpino", in *Dizionario biografico degli Italiani* (Rome: 1980) XXIV, 122–125; Viviani U., *Vita e opere dii Andrea Cesalpino* (Arezzo: 1922); Colombero C., "Pensiero filosofico di Andrea A. Cesalpino", *Rivista critica di storia della filosofia* 32 (1977) 269–284 and Bylebyl J.J., "Cesalpino and Harvey on the Portal Circulation" in Debus A.G. (ed.), *Science, Medicine, and Society in the Renaissance. Essays to honour Walter Pagel* (New York: 1972) 39–52.

Fig. 3. Maarten van Heemskerck, *Christ crowned with thorns*, ca. 1550/1555.

anatomist, the botanist Luca Ghini (1490–1556), and the anatomists Realdo Colombo (1516–1559) and Gabriele Fallopio (1523–1562).[39] Colombo in particular must have exerted a major influence on Cesalpino in several respects. He set an example by exchanging Pisa and Padua for Rome, trying his luck at the more rewarding as well as more lucrative papal court. Cesalpino would likewise find himself in the Eternal City in the latter part of his career, in the capacity of papal physician. Colombo is still known for his discovery of the so-called 'pulmonary or lesser circulation of blood', demonstrating that all the blood goes from the right ventricle of the heart through the lungs before returning to the left ventricle.[40] This breakthrough disproved Galen's idea that blood passed from the right to the left ventricle through minute pores in the *septum*, the dividing wall between the two ventricles of the heart. It is possible that Colombo and his Romano-Spanish pupil Juan Valverde d'Amusco might have built these findings on Michael Servetus' (1511–1553) work *Christianismi restitutio* (1553), a treatise that was confiscated by the Inquisition. Undeniably, Servetus' ideas on blood and its function within a system of unified body and soul bear a clear resemblance to those of Colombo and Cesalpino.[41]

While living and working in Rome, Cesalpino's deep religiosity not only made him a reliable physician to popes and cardinals, but his convictions equally drove him into the arms of the Roman Counter-Reformation religious leader Filippo Neri and his Oratory.[42] All of these factors had a profound influence on his medical views, leading him to accommodate them to Catholic doctrine and practice. In their high tone, Cesalpino's medical works resemble those of Andreas Vesalius and in turn those of the common adversary of both of them, Galen. Nonetheless, he by no means envisioned himself as an innovator, which had been an image Vesalius had to some extent cherished. On the contrary, in line with the spirit of

[39] Grendler P., *The Universities of the Italian Renaissance* (Baltimore: 2002) 70–77.

[40] There are no comprehensive publications on Colombo. See: Bylebyl J.J., "Realdo Colombo", in Gillespie C.C. (ed.), *Dictionary of Scientific Biography* (New York: 1973) viii, 354–357; Moes R.J. – O'Malley C.D., "Realdo Colombo: On those Things rarely found in Anatomy, an Annotated Translation from the *De re anatomica* (1559)" , *Bulletin for the History of Medicine* 34 (1960) 508–528 and Cunningham, *Anatomical Renaissance* 143–166.

[41] For a summary of this discussion see Mason S., "Religious Reform and the Pulmonary Transit of the Blood", *History of Science* 41 (2003) 459–471.

[42] See Santing C., "*De affectibus cordis et palpitatione* – Secrets of the Heart in Counter-Reformation Italy" in Blecourt W. de – Usborne C. (eds.), *Cultural Approaches to the History of Medicine. Mediating Medicine in Early Modern and Modern Europe* (Basingstoke: 2003) 10–35 and Touber J.J., *Emblemen van lijdzaamheid. Recht, geneeskunde en techniek in het hagiografische werk van Antonio Gallonio* (1556–1605) (Groningen: 2009).

the Counter-Reformation, which aimed to return to the time of the Early Church in Antiquity, he wholeheartedly embraced Aristotle. This preference for the Greek philosopher deepened when, in the course of the sixteenth century, the papacy, together with leading theologians, often members of newly established orders, came to reaffirm the ties between Catholicism and Aristotelianism.[43] Cesalpino's constant disapproval of Galen who, as we have seen above with regard to Lemnius, was still extremely popular, is also connected to the realisation of Aristotle's research programme in the sixteenth century.[44] In pleading his case, Cesalpino moved from what might be called a *prisca medicina* towards a synthesis of faith and reason. In this Aristotelian *medicina theologica*, that was also influenced by the works of Marsilio Ficino, blood and the heart played the leading roles, while God functioned as the one and only constituent cause of all things.[45] In this regard, Cesalpino once used the term *deus rotator* to describe the work of God, suggesting that he valued the heart as God's counterpart, as some kind of 'microrotator' (my term).

Before discussing further Cesalpino's considerations on blood, it is important to state again that in the sixteenth century several types of blood were distinguished, and he was very conscious of all of the subtle distinctions between them. The first type was the bodily fluid, forming part of the humoral system, which had its origin in the liver. Ingested food, transformed by the stomach into chyle, was transported to the liver, where it was heated to become blood. The two types of bile originated in the same organ. The fluid to be found in the veins was considered to be a sanguineous mass consisting of a mixture of pure blood with a lesser proportion of the other three humours. However, Cesalpino's interest mainly lay in the second type of blood. This was a concoction that combined blood and spirit, the latter drawn by the lungs from the air and brought into the heart. He sometimes calls this 'perfected' or 'matured' blood.

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[43] See for example, Grendler, *Italian Universities* 309 and Cunningham, *Anatomical Renaissance*.

[44] Cunningham A., "Fabricius and the 'Aristotle Project' in Anatomical Teaching and Research at Padua", in Wear A. – French R.K. – Lonie I.M. (eds.), *The Medical Renaissance of the Sixteenth Century* (Cambridge: 1985) 195–222 and idem, *Anatomical Renaissance*.

[45] On the intricacies of Christian Platonism in this respect see Mulsow M., "The Ambiguities of the Prisca Sapientia in Late Renaissance Humanism", *Journal of the History of Ideas* 65 (2004) 1–13, who discusses Cesalpino's counterpart Francesco Patrizi and his *Discussiones Peripateticae* (Venice, Giunta: 1571). This combination of Aristotelianism with (Neo)Platonic influences is also to be met in Melanchthon: Frank G., "Melanchthon and the Tradition of Neoplatonism", in Helm J. – Winkelmann A. (eds.), *Religious Confessions and the Sciences in the Sixteenth Century* (Leiden: 2001) 3–18.

The resulting mixture formed the vehicle of the *spiritus vitalis* that followed its course through the body via the arteries. In addition to the perfected blood, the *virtus vitalis* is a crucial element in Cesalpino's discourse. This is the faculty present in man that guaranteed the existence of the vital spirit and therefore was a crucial element in the principle of life. Having its foundations in the heart, it manifested itself via heartbeat, pulse and respiration. The associated organs were those of the thoracic cavity and the arteries, with the heart at the centre.[46]

The fifth book of his *Questiones peripateticarum* discusses biological and physiological topics.[47] Tellingly, the point of departure is the unity of the human body, which is safeguarded by the soul. Galen and Plato, with their notion of a triple soul, are fiercely denounced, leading to a discussion of the different parts of the soul and the disparities between the various species. Creatures which have a heart, and thus live because they have blood, are professed to belong to the most perfect class. The explanation for this is that the heart is proclaimed to be the first organ to be formed in the foetus and the last to die, an argument borrowed from Aristotle's *De partibus animalium*.[48] Cesalpino states that without this organ all other parts of the human body are merely 'dead hands' or 'dead eyes'. Contrary to the brain or the liver, which can function with minor blemishes, here not the slightest loss of quality can be tolerated; every tear proves fatal. Therefore, for Cesalpino the heart is the origin of all corporeal operation; out of affection for it every other organ follows its lead, as with the cardiac pulsations, for example.

The superiority of the heart is given a fourfold Aristotelian grounding. First, of course, is its position at the centre, being the best location for the even distribution of life through the body. Obviously, 'at the centre' suggests all kinds of other, non-medical references to perfection and the ideal. According to Cesalpino, the most important argument for the

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[46] The sixteenth-century discussion is explained by Bylebyl J.J., "Disputation and Description in the Renaissance Pulse Controversy" in Wear A. – French R.K. – Lonie I.M. (eds.), *The Medical Renaissance of the Sixteenth Century* (Cambridge: 1985) 223–244. For a brief description of the physiological system concerning virtues, faculties, spirits, etc., see Siraisi, *Medieval and Renaissance Medicine*, ch. iv.

[47] *Quaestionum peripateticarum libri* V. The first edition was published in 1571, the second in 1593. The translation of most parts of the five books with an introduction to his philosophy was carried out by Dorolle M., *Césalpin Questions Péripatéticiens* (Paris: 1929). For Book V, 4 Clark M.E. – Minis S.A. – Rochefort G., "Andreas Cesalpino, '*Quaestionum peripateticarum*', libri v, liber v, quaestio IV", *Journal of the History of Medicine and Allied Sciences* 33 (1978) 185–213.

[48] Arist. *PA* 3.4.

primacy of the heart is that it contains and maintains the warmth of the soul, the *virtus vitalis.* All other organs acquire their warmth from it. This interpretation brings him to the arteries and veins. They are also bound to have their origin in the heart, where the heat produces blood, the supreme nourishment, which is to be dispersed throughout the body by the arteries and brought back to its origin by the veins. Here, Cesalpino also compares the arteries with rivulets drawing their fluid from a source, but at the same time emphasises that veins and arteries form a single, uninterrupted, system. Even the nerves form part of this completely interconnected transit system, being viewed as the finest ends of the capillaries of the aorta.[49] Thus, blood – that is, perfected blood – is declared the supreme nourishment and the concoction that engenders the growth and maturation of all creatures. As such, it must emerge from the source of heat: the heart. This interpretation is based on the observation that after conception the very early foetus looks like a bloody clot.

Subsequently, the author feels compelled to elucidate the movement of blood through the body. To begin with, the Galenic idea about veins and arteries with their separate tasks is denounced in favour of the unified Aristotelian system. The problems with the precise details of Cesalpino's ideas in this context are widely discussed in the literature, but the system he sketches is still very confusing. For the purposes of my argument here, it is enough to know that in the right ventricle of the heart the richest and warmest blood was found, whereas the purest and freshest blood was found in the left ventricle. The former's function was supposed to be sustenance, distributed via the *vena cava*. The latter's task was maintaining and maturing the body's form through the *aorta.* Ultimately, the pure fresh blood ascended from the heart towards the brain, and as such this fine and pure matter generated the sensations, which otherwise would be far too unsubtle and even coarse. One could say that blood was thought to be refined a further time in the brain. The excess warmth was regarded as being cooled by the humidity and low temperature of the brain. Again, this was done best in human beings, as they had the most blood and most heat at their disposal and also had the largest brains.

In the eyes of Cesalpino, the pulsation of the heart and the arteries was the result of the boiling of the humour of blood in the heart; that is, the creation of perfected blood, mentioned above. This is logical, he says,

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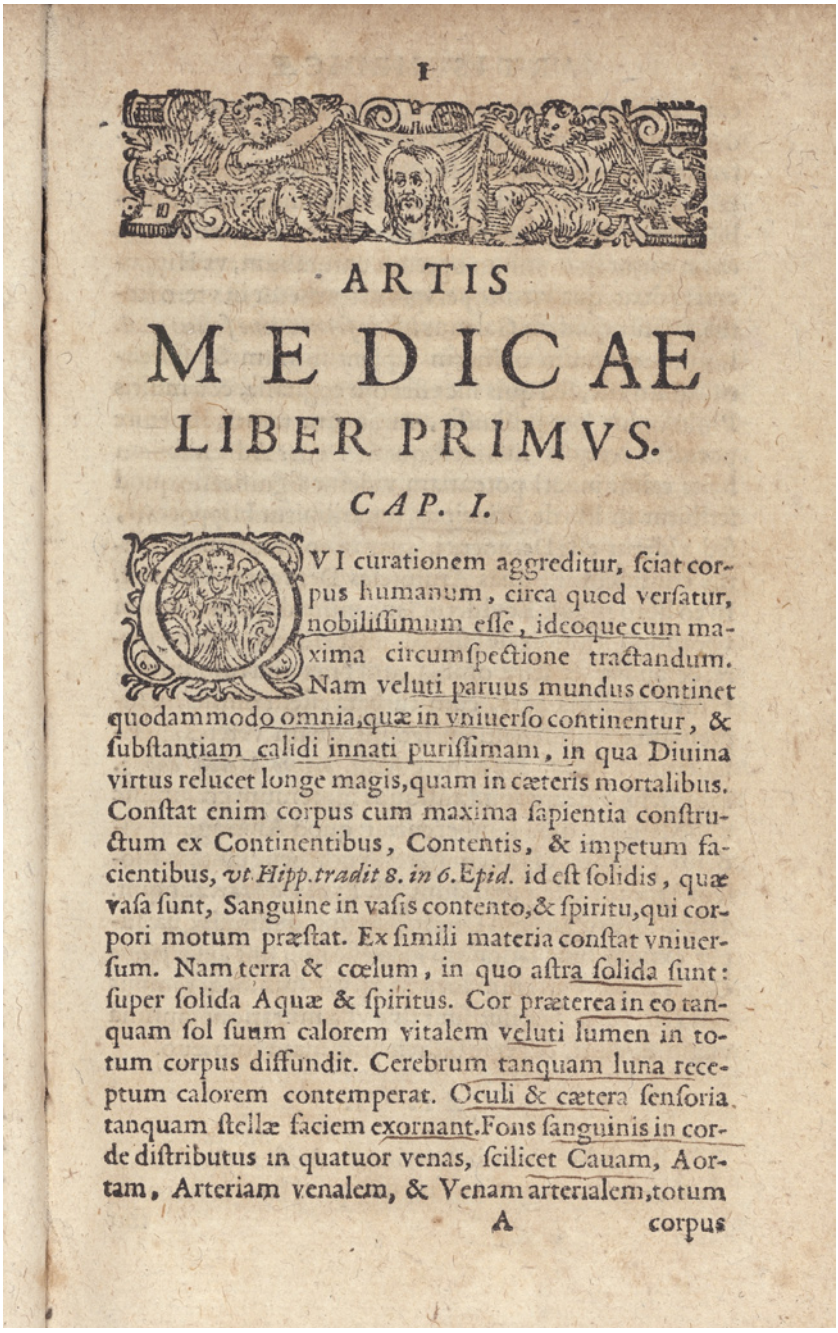
[49] All to be found in *Questiones*, book 5, question III, "That the heart is not only the principle of the arteries, but also of the nerves."

since pulsations also occur in other fluids that are boiled. To achieve this, the heart and the vessels swell up. This contradicts Galen, who claimed that there was an alternating pulsation in the heart and arteries and also established that there was a relationship between respiration and the cooling of blood. Cesalpino, however, asserts that 'all the arteries with the heart, moreover, are like a kind of whole, for they form a continuous vessel of pure blood'.[50] In his view, nourishment of the parts of the body occurs via the continuous generation of blood in the heart. The blood pulses strongly in the arteries because of the spirit they carry through the body. This reasoning brings Cesalpino to his description of the blood's movement. Here he makes a meticulous distinction between the arteries and veins and seems to have a clear idea of the position and function of the valves, which secure a very specific path for the blood: 'from the veins into the heart while the heat [of the heart] is drawing nourishment from the heart into the arteries'.[51] For Cesalpino, this nourishment is the spirit prepared by the warmth in the heart and dispersed by arterial blood. To maintain this warmth, nature had placed the heart at the centre of the body and took care to protect it with the pericardium. The cooling process is said to occur in the lungs, described more or less in accordance with the opinion of his teacher Colombo, except for the remarks on the anastomosis, where he still leaves some space for the movement of blood through septal pores:

> [...] The lung, then, draws warm blood through the veinlike artery [*vena arterialis*] from the right ventricle of the heart and returns it through anastomosis to the *arteria venalis*, which enters the left ventricle of the heart. In the meantime there is cooling only by contact with the cool air transmitted through the canals of the windpipe, which spread out next to the *arteria venalis*, but do not communicate by openings, as Galen thought. Dissection corroborates this circulation of blood from the right ventricle through the lungs and to the left ventricle of the same.[52]

In the first lines of his handbook, *Ars medica* (1602–1603), Cesalpino enlightens us as to the general principles of healing and the constitution of the human body [Fig. 4].[53] Human beings are immediately characterised as *mundus parvus* and likened to creation as a whole. Here, the views on blood do not deviate from those expressed in the much older *Questiones*,

[50] Clark – Nimis – Rochefort, "Cesalpino" 197.
[51] Clark – Nimis – Rochefort, "Cesalpino" 199.
[52] Clark – Nimis – Rochefort, "Cesalpino" 209.
[53] Cesalpino Andrea, *Ars medica* (Rome, Aloysius Zanettus: 1602–1603).



I

ARTIS

MEDICAE

LIBER PRIMVS.

CAP. I.

QVI curationem aggreditur, sciat corpus humanum, circa quod versatur, nobilissimum esse, ideoque cum maxima circumspectione tractandum. Nam veluti paruus mundus continet quodammodo omnia, quæ in vniuerso continentur, & substantiam calidi innati purissimam, in qua Diuina virtus relucet longe magis, quam in cæteris mortalibus. Constat enim corpus cum maxima sapientia constructum ex Continentibus, Contentis, & impetum facientibus, *vt Hipp. tradit 8. in 6. Epid.* id est solidis, quæ vasa sunt, Sanguine in vasis contento, & spiritu, qui corpori motum præstat. Ex simili materia constat vniuersum. Nam terra & cœlum, in quo astra solida sunt: super solida Aquæ & spiritus. Cor præterea in eo tanquam sol suum calorem vitalem veluti lumen in totum corpus diffundit. Cerebrum tanquam luna receptum calorem contemperat. Oculi & cætera sensoria tanquam stellæ faciem exornant. Fons sanguinis in corde distributus in quatuor venas, scilicet Cauam, Aortam, Arteriam venalem, & Venam arterialem, totum

A corpus

Fig. 4. Beginning of the first book of Andrea Cesalpino's handbook *Ars medica* with an image of the Vera Icon in the top margin.

but his Christian world-view, not to say 'body view', seems to have developed after his arrival in Rome. In the capacity of a 'little world', the author maintained, everything the human body contains was also to be found in the universe. Its most precious matter and purest substance was the *calor innatu*s or innate heat, in which the divine virtus was far brighter than in any other mortal matter. Hence, the body is considered to be divinely constructed, with ultimate wisdom and as an uninterrupted whole, as a container in which blood procured spirit throughout the body. The source of this blood, he says, lies in the heart and thus this organ is the most important to human beings. He compares it with the sun and its rays, but also with God and the Holy Spirit. The biblical reference is unmistakable, with the four veins – (*Vena*) *Cava, Aorta, Arteria venalis and Vena arterialis* – that distribute the blood likened to the four rivers springing from Paradise.

In conclusion, one could say that Cesalpino's natural philosophy focuses on the centre of life and aims to investigate its secrets. In his *Questiones* he concludes: 'The heart is like a flame effecting the heating of blood and continual generation of spirit', which sounds very much like Lemnius. Although in his *Ars medica* he carefully distinguished the role of the doctor from that of God, it obvious that he judges the truths of Christianity to be revealed in the human body, its fabrication and workings. His views on the heart and blood, and therefore his fervent denial of Galen, must have been religiously motivated. The fact of the matter is that Aristotle's preference for the heart as the ruling part of the body is in line with the doctor's devotional inclinations. The circulation of blood was a refuelling procedure which fed the body and distributed warmth. The perfected blood and the heart's faculty, *spiritus*, become equivalents of the Holy Spirit and its divine fervour.

The s/Spirit of blood

The study of blood is a many-voiced enterprise. In premodern times the unravelling of its secrets was of a mixed, that is, philosophical, medical and religious, nature and I hope to have demonstrated that blood was seen as precious in several of the discourses then current. Each genre, of course, adhered to its disciplinary practices, but the incentives steering its authors cannot be labelled unequivocally religious, philosophical or medical. The essence of the problem is that as a material substance blood was still valued as so very precious that it paradoxically tended to lose its

materiality and take on spiritual aspects, which made devotional associations inevitable. Caroline Walker Bynum was completely correct to point to the non-corporeal aspects of blood, associating it with God, especially with the Holy Spirit and its terrestrial emanation. No matter how they exploited Aristotle, as well as Galen, a spiritualisation of blood was also at stake in the works of Lemnius and Cesalpino and, for instance, that of Paracelsus too, although there is no room here to discuss his 'Spiritualist reform of medicine'.[54] In his extensive *regimina*, the more traditional Levinus Lemnius emphasised the *spiritus vitalis* that determined the quality of blood. At its finest stage, it approached the *spiritus universalis* almost converging with the Holy Spirit. Likewise the Aristotelian Cesalpino placed the heart and the spiritualised human fuel blood again and again at the centre, bringing everything back to its origin, God: the *deus rotator*.

[54] Cunningham, *Anatomical Renaissance* 236–247.

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