

Sacred hearts and pumps: cardiology and the conflicted body politic (1500–1900)

Therese Feiler

Correspondence to

Dr Therese Feiler, Evangelisch-Theologische Fakultät, Ludwig-Maximilians-Universität München, München, Germany; therese.feiler@evtheol.uni-muenchen.de

This article is part of 'The Heart in Medicine, History and Culture' issue.

Accepted 30 July 2020

ABSTRACT

This article examines how conflicting notions of the body politic between the natural and the spiritual have contextualised the evolution of cardiology. After a brief look at the place of the heart in biblical, patristic and medieval notions of the church, the article turns to the Reformation period. While Martin Luther moved theological gravity to the individual's heart and conscience, his contemporary Michael Servetus described the pulmonary cycle in the context of an antitrinitarian theology condemned as theological and political heresy. In the early modern period, nature conceived as creation grounded sovereign political authority, which science could then align with. Whereas William Harvey still adhered to an Aristotelian teleology, René Descartes and subsequent mechanistic contributions to cardiology were flanked by an intense 'cardiolatry'. Both, it is argued, are two sides of the same, almost non-corporeal coin. The emerging Enlightened epistemology allowed for a position distinct from both sovereign and ecclesial powers. The French Revolution was a paradigm shift: the ancien régime falls, and its Sacred Heart devotion is mocked; the new 'Erastian' state-university emerges as the context of cardiology. These developments are reflected in the life of René Laënnec and in cultural interpretations of the heart later in the 19th century. It is shown that the heart as a doubly inscribed, both biological and spiritual organ, played a central role in theological, and therefore political and scientific notions of the body politic. These continue to haunt the present, allowing us to interpret normative appeals to the heart particularly in political contexts.

INTRODUCTION

In the Judaeo-Christian tradition, the heart constitutes the human person as a thinking, relational and therefore also political being.¹ At present, polities throughout the Western world are facing unprecedented challenges to their integrity. Hence, a perennial question once again becomes acute: Who or what are *we*? If the heart is an essential element of anthropology, then writing a history of the heart in this context is not merely collecting cultural artefacts, or recalling curious twists and turns of emotionality throughout the ages. It is to unpack ethical possibilities of the present within shifting ontologies of power and nature, both with deep historical roots. Any historical sociology of ideas is highly suggestive. Histories of the heart may thus focus on the emancipatory individual², or they may advocate a more holistic approach, taking into account affective and emotional elements of the heart.³ Postmodern approaches may leave

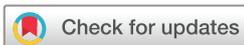
Judaeo-Christian traditions behind altogether and reach back to ancient mythological figures such as the goddess of care (Cura) for a normative grounding.⁴ Such a polytheistic approach certainly multiplies and thus fragments the theological horizon.

In order to contextualise the uses and abuses of appeals to the heart in such a fragmented age, this article will retrace how the heart has been both constitutive of, and constructed by, the body politic. In the Western tradition, a fundamental tension between the 'natural' and the 'spiritual' has frequently stirred conflicts between potentially rival notions of the 'true' body politic: the church, the state, or conflicting combinations of both. In this way, however, theology has also positioned the concepts and practice of science. Indeed, science could not help being part of these conflicts. At times it even emerged out of them. The heart is of particular significance here: it is always doubly inscribed, doubly functioning: as a biological centre of the body as well as an affective, spiritual and symbolic organ. As such, its meaning and significance shifts together with the theological grounds on which political powers and scientific knowledge legitimately function. Metaphors of the heart, blood or circulation shape the religious and political imagination of a communal body. In turn, scientific epistemologies have contributed to the understanding of the state and the modern subject, the heart being a major object of research. Scientific methods frequently become those of government.

Looking therefore specifically at milestones in cardiology, I will in the following show how theological *topoi* have shaped the connection between politics and science in the period between 1500 and 1900. Moving from the Eucharist and individual faith to nature in early modernity, we see the interpretation of the heart and medical science shift within the coordinates of theological-political conflicts. With the Enlightenment and the French Revolution, national and scientific bodies remain theologically laden. This feeds back also into the notion of the heart as an organ of faith and piety. As we will see, contemporary readings of the heart will have to take into account older conflicts recurring in new guises as well as a 'body politic' marked by fragmentation, datafication and digitalisation.

The open wound of the crucified—the early church and the mystical body politic

The gospel of John (late 1st century) narrates a detail from Crucifixion scene that became the central focus for what one might call the corporate



© Author(s) (or their employer(s)) 2020. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Feiler T. *Med Humanit* 2020;**46**:352–361.

interpretation of the Christian heart.⁵ As the body of the deceased Christ was still on the cross, ‘... one of the soldiers pierced His side with a spear, and immediately blood and water came out’ (John 19:34, NKJV). In later Antiquity Christian exegetes saw this as highly authoritative for the church as a mystical body. In the eastern Roman Empire, John Chrysostom (c. 344–407) explained the meaning of Christ’s wounds in one of his Catechisms: ‘The one [water] was a symbol of baptism, and the other [blood] of the mysteries’, whereby ‘mysteries’ signifies the Eucharist.⁶ And, he continued, ‘It is from both of these that the Church is sprung through the bath of regeneration and renewal by the Holy Spirit...’.⁷ Chrysostom’s Western contemporary Augustine of Hippo (354–430) emphasised the teleology inherent in these events: ‘The Evangelist used a wide awake word so that he did not say, “pierced his side” or “wounded” or anything else, but “opened”, so that there, in a manner of speaking, the door of life was thrown open from which the mystical rites of the Church flowed, without which one does not enter into the life which is true life’.⁸

Several ‘types’ in the Old Testament were thought to undergird the authority of these events for the formation of the church: Christ had formed his church ‘just as He formed Eve from the side of Adam’. Augustine refers to Noah, who ‘was ordered to make a door in the side of the ark where the animals that were not going to perish in the flood might enter’. In the book of Ezekiel, the exiled prophet’s vision of the new temple, specifically the ‘water ... coming down from under the south side of the temple, south of the altar’ (cp. 47:1–2) was interpreted to prefigure the church as the temple of the Holy Spirit. Thus, the fundamental question of social or political existence—“Who *are we*?”—could only be answered with reference to the water and blood oozing from the pierced side.

The medieval heart: contemplation and the mystical body politic

When referring to the crucifixion, neither the gospels nor the church fathers specifically mentioned the heart, merely Christ’s pierced ‘side’. Only gradually, the approach to John’s gospel changed from typological exegesis into a form of pious contemplation of the five wounds. For example, Anselm of Canterbury (1033–1109) in *De Passione Christi* praised the ‘sweetness’ of Jesus in the ‘opening of the side’; similarly, Bernard of Clairvaux (1090–1153), saw ‘the secret of the heart’ lying open through the gaping the wound. In a mystical vision Gertrud of Helfta (Thuringia) (1265–1302) saw her heart pierced by a ray coming from the divine heart. Christ then put her hand into his wound, and when she retrieved it, she had seven golden rings on it.⁹ Julian of Norwich (1342–1416) described his ‘blissful heart split completely in two’, with which Christ ‘showed to my understanding, in part, the blessed godhead... that is to mean, the endless love that was without beginning, and is, and shall be forever’. As Veronika Rolf puts it: ‘The gaping wound from the spear in his flesh becomes the graphic image of Christ’s broken heart, which in turn becomes the spiritual dwelling place for all humankind’.¹⁰

The patristic heritage is extended *both* in terms of a mystical heart (contemplative, corporate existence with the saints or God) *and* a natural theology. The latter encompassed physiology. Hence, in a little known tract *De Motu Cordis* (ca. 1270) Thomas Aquinas follows the Aristotelian line of the soul as the vivifying principle of the organ: ‘...the motion of the heart is a natural motion of the animal ... a natural result of the soul, the form of the living body and principally of the heart’.¹¹ This is

far from a modern scientific ontology, because for Aquinas the material was suspended from the divine. The material world was lawfully ordered towards its fulfilment at the end of a cosmic journey culminating in beatitude. In that sense, both the biological and the political were aspects of a cosmic order structured and governed by a unified divine principle.¹² Despite struggles over competences, the political was integrated into this whole, governed ultimately by the church.

The reformation: break-ups, divisions and new scientific positions

With the Reformation, the medieval theopolitical and scientific order broke apart. The heart gained a new significance for the inner life of the human being. But this also opened up a new space for the scientific heart.

Martin Luther—heart and conscience

The era’s pivotal figure, Martin Luther, with one leg still stands in the apocalyptic, mystical world of the late Middle Ages. This is reflected in a sermon he held on Good Friday 1519, two years after he had nailed his 95 theses against papal indulgences on Wittenberg’s *Schlosskirche*. Looking at Christ’s wounds, Luther tells the congregation, should be an occasion to truly consider *one’s own* depravity. He characteristically emphasises this against the contemporary affirmation of human abilities to cooperate in salvation (and the Church’s rites and institutions facilitating that). By contrast, those meditate on the Passion of Christ rightly, who first ‘so view Christ that they become terror stricken in their heart at the sight, and their conscience at once sinks into despair’. That is because one should ‘deeply believe and never doubt the least, that you are the one who thus martyred Christ. For your sins most surely did it’. Indeed, Luther presses on, ‘when you view the nails piercing through his hands, firmly believe it is your work...’¹³ Having then ‘cast your sins from yourself on Christ’, one may believe ‘with festive spirit’ that ‘...he carries them and makes satisfaction for them’. The sins are then *removed*: ‘...on Christ they cannot rest, there they are swallowed up by his resurrection, and you see now no wound, no pain, in him, that is, no sign of sin’. With this a new possibility opens up: ‘... behold his friendly heart, how full of love it is toward you, which love constrained him to bear the heavy load of your conscience and your sin’.¹⁴ Luther, still an Augustinian monk at the time, echoes a late medieval mysticism: ‘Then ascend higher through the heart of Christ to the heart of God, and see that Christ would not have been able to love you if God had not willed it in eternal love, to which Christ is obedient in his love toward you; there you will find the divine, good father heart, and, as Christ says, be thus drawn to the Father through Christ’.

In the summer of that same year, the University at Leipzig organised an academic disputation between the Wittenberg theologians and Johannes Eck. The Leipzig Disputation was more significant than was apparent at the time: by challenging the final teaching authority of the pope, Luther and his colleagues effectively broke with the Catholic faith and the imperial-papal order. Luther’s notion of authority aligned with the German electoral dukes’ budding proto-national interests. At the same time, he left the medical faculty of the university to reform itself. Thus, he carved out a new, independent space for medical science, which Reformers after him would put to varying uses.¹⁵

Servetus—antitrinitarianism and the pulmonary cycle

Michael Servetus came to an altogether different position, ‘heretical’ both in theological and political terms. His thought and life tragically unites antitrinitarianism, political dissent and (proto-)scientific discovery. Born in Navarre (Spain) in 1509 or 1511, he studied law, after which he briefly became private secretary to the confessor of Emperor Charles V. Having acquainted himself with the Reformers’ ideas on his travels with Charles’ entourage, Servetus found himself on the outside: “I neither agree nor disagree in every particular with either Catholic or Reformer. ... It would be easy enough, indeed, to judge dispassionately of everything, were we but suffered without molestation by the churches freely to speak our minds”.¹⁶

Servetus’ inquisitive mind, at times combined with insubordinate sarcasm, invited trouble. Both Luther and Calvin had reformulated the doctrine of the Trinity. But in 1531 Servetus published *The Errors of the Trinity*, in which he altogether denied this classical doctrine. In Servetus’ reading, one divine, spiritual substance expressed itself in three different modes or appearances. These views severely threatened the theological legitimacy underlying the political order: the material world would no longer be uplifted into an eternal, divine life through Christ’s death on the cross and resurrection. Rather, it would go adrift or turn out to be in the hands of mystical, magical powers (despite an overall irenic mindset). Either way, the individual believer was no longer tied into traditional ecclesial structures, whether Catholic or Reformed. Hence, even quite liberal Swiss clerics regarded the book as dangerous ‘trash’, demanding Servetus be severely punished.¹⁷

Servetus relocated to Paris, where he became assistant to the anatomist Johann Guenther of Andernach (1505–1564), who later praised both Servetus and Andreas Vesalius (1514–1564) as his best students. After more than a decade of practising medicine in Lyon and Orléans, the restless intellectual Servetus entered a fateful correspondence with John Calvin. He attacked the sacraments, the interpretation of the Trinity, and was outspoken about once again reforming the church. Calvin was shocked and repulsed. In his *Christianismi Restitutio*, secretly published in 1553, Servetus went on to elaborate his doctrine: It was not the case that Jesus the human being somehow took on a fictitious ‘second person’, that is, the eternal Son, he said. Rather, ‘The *human being* Jesus Christ himself is the door and the way’.¹⁸ Yet if the *finite* human being Jesus *is* the Son of God, this generation from the divine logos would continue to make (human) nature divine as a whole. Servetus’ question as to how exactly the divine soul entered the human body was then the very context for his explanation of the pulmonary cycle: the blood was sent from the right ventricle to the lungs. There it was enriched by the divine spirit with every breath, to then be sent to the left ventricle and onwards into the body.¹⁹

Escaping the French Inquisition, Servetus decided to travel to Italy via Geneva, probably seeking to challenge Calvin in public. Once Calvin had learnt of Servetus’ presence, he made sure Servetus was arrested and kept under cruel conditions. He was charged and condemned for heresy. He died spectacularly: burning at the stake near Geneva, he is said to have invoked mercy from the Son of the ‘eternal God’ (not: *eternal* Son). At Vienne in France he was burnt again, this time in effigy.

In the case of Servetus, the emergence of cardiological knowledge was directly tied into theological debates. The political, hence also ecclesial, understanding of government effectively turned his scientific endeavour into an act of individual subversion.²⁰ Strong parallels have been identified with the Anabaptist

Christian Entfelder’s *On Knowledge of God and Jesus Christ our Lord* (1530).²¹ However, Servetus’ most vocal defender Sebastian Castellio spoke out in favour of freedom of conscience, thus aligning Servetus with religious tolerance and (proto-)liberal humanism.²² Indeed, well into the 19th century, Servetus was *the* example to demonstrate Calvin’s bigotry.²³ Among medical historians Servetus is frequently regarded as a tragic defender of unprejudiced scientific enquiry. William Osler (1849–1919), an expert in cardiology and besides much else ‘father’ of modern medical education, wrote a small volume on Servetus.²⁴ More recently, Servetus has been interpreted as the last goat sacrificed on the altar of an envious, ignorant medieval apparatus, inaugurating the age of science.²⁵ Whether Servetus actually made a *medical* discovery is therefore a sensitive question. If he did, radically Reformed antitrinitarianism is part of science’s theological-political and ethical DNA. If he did not, his theological thought and personal faith can no longer be inscribed into the historical emergence of the modern (scientific) heart.²⁶ Certainly in the decades that followed, the theological grounds of political authority as well as science would shift.

Early modernity—nature, divine right and residual Aristotelianism

The early moderns ‘of the new learning’ imbibed Renaissance humanism, drawing again on Aristotle. *Nature* rather than an order mediated by a divine spirit or the church became an object of enquiry. Truth could be found in physical processes open to observation and analysis. Yet nature is (still) elevated, often tenderly revered. It is God’s creation, given to the present age by virtue of his providence. Besides a contemporary sense of scepticism, nature could also be crowned by divine splendour—and evoke unassailable royal authority. In this context, the anatomist William Harvey (1578–1657) undertook his studies of the circulation of the blood.

After Queen Elisabeth had died in 1603, the young king James VI of Scotland claimed the crown of England by virtue of his Tudor ancestry. Through *nature*, as it were, ‘true kings’ and their ‘naturall subjects’ were instituted by God alone. In a speech in 1604, he famously reminded Parliament of the ‘naturall and Physicall reasons’ for his position. He countered papal critics of the hereditary principle (and *their* claims to supremacy). He even redeployed the Reformation’s analogy with Christ’s marriage to each believer’s soul. ‘What God hath conjoined let no man separate. I am the husband and the whole isle is my lawful wife; I am the head and it is my body; I am the shepherd and it is my flock’.²⁷ He thus firmly planted the islands’ *ecclesial* body under a newly emphasised *royal* supremacy. James continued to insist on his ‘Trew, Ancient, Catholike and Apostolike faith’, vowing that he would keep himself ‘from either being an hereticke in Faith, or schismatick in matters of Pollicie’.²⁸ But he sharply admonished the ‘Papists’ to ‘presume not so much on my Lenitie (because I would be loath to be thought a Persecuter)’.²⁹ Throughout his reign he remained under constant pressure from Puritan non-conformists who seriously challenged his ‘divine right’ to rule. Nonetheless, with royal absolutism grounded in ‘naturall reasons’, it was easy for early modern science to align with it.

William Harvey—ambiguous Aristotelianism

Already for his Lumleian Lectures at Oxford (beginning in 1616), Harvey had jotted down doubts over Galen’s physiology, according to which heated blood was pumped into the periphery of the body. For Harvey, the numbers just didn’t add up. With more than a thousand beats per half-hour, the body could

impossibly produce so much blood continuously. After years of meticulous dissections, he published the *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* in 1628. It showed that the blood circulated, rhythmically, repeatedly pumped around by the heart.

By that time, Harvey was already physician to James' son, King Charles I. Whereas James had thought doctors were hardly necessary or helpful³⁰ and hardly followed Harvey's advice, his successor maintained a lively interest in scientific progress. In turn, Harvey's dedicatory preface to *De Motu* explicitly aligned natural forces and political power:

The heart of animals is the foundation of their life, the sovereign of everything within them, the sun of their microcosm, that on which all growth depends, from which all power proceeds. The King, in like manner, is the foundation of his kingdom, the sun of the world around him, the heart of the republic, the fountain whence all power, all grace doth flow.³¹

Charles took James' interpretation of the divine right of kings to new heights. In 1629, he dissolved Parliament, although to the detriment of his authority in the long run. In 1640 he fled London; 2 years later civil war broke out between royalist Cavaliers and the parliamentarian Roundheads. In the winter of 1643, Harvey came to Oxford with the king, who set up his (significantly reduced) government headquarters there. Harvey became Warden at Merton, where it seems he eagerly continued his studies. In April 1646 the king fled Oxford, but soon he gave himself up to the Scottish army. After Oliver Cromwell's final victory over the Royalists, Charles was tried and executed in 1649. For Harvey, aged 70 at the time, a long, stellar career came to an end. As a Royalist 'delinquent' he was fined the (*very*) large sum of £2000. He continued his practice and studies outside the 20-mile ban in London. As late as 1650, his patient Lady Thynne in London had to vouch that besides the consultation he 'would not do anything to the detriment of the Commonwealth'.³²

Meanwhile, science also fed back into political thought. In line with Aristotelian teleology, Harvey saw the heart and the blood as constitutive of an ordered, meaningful process in which every element had a purpose. Harvey's friend Thomas Hobbes drew on the new physiology for his theory of the state. Hobbes' multitude of people does not merely set up a social contract. Rather, the state or Leviathan is a multitudinous person representing itself; the sovereign power is its 'artificial soul'. The 'blood' of this state, requiring constant circulation and sovereign control, is - money.³³

Absolutist constellations: mechanism and cardiolatry in the 17th and 18th centuries

The 'ambiguous' Aristotelianism and vitalism of Harvey and Hobbes elsewhere took an entirely different direction.³⁴ In this new age of uncertainty, natural philosophers developed a new, *mechanistic* understanding of the body. Besides the Calvinist Netherlands, the Italian duchies and an independently-minded French aristocracy were particularly hospitable to these ideas. Meanwhile, Catholic theology and ecclesial-political powers forcefully reasserted themselves. Yet they also embraced scientific learning when it suited, although not without resistance from traditionalists.³⁵

Mechanic hearts: Descartes, Malpighi and Baglivi

René Descartes eagerly disseminated, but also fundamentally reinterpreted Harvey's work. In his *The Passions of the Soul* (1649), the heart was no longer a splendid sovereign, but simply

a well-functioning heating machine. Descartes identified the brain as the central, active force in the body.³⁶ The physician to provide the final missing link to understanding the circulation of the blood, however, was Marcello Malpighi. Born in the same year Harvey published *De Motu Cordis* (1629), Malpighi graduated from the university of Bologna with degrees in medicine and philosophy. At the invitation of Ferdinando II, Duke of Tuscany, he accepted the first chair in Theoretical Medicine at the University of Pisa in 1656. Ferdinando for his part was a technology and science enthusiast. Some 20 years earlier he had been the patron and protector of Galileo Galilei, who dedicated his *Dialogue Concerning the Two Chief World Systems* (1632) to him. To protect him, Ferdinando then delayed a hearing by the Inquisition. When Galileo's life-sentence was converted to house-arrest, Ferdinando took him back to Florence. Malpighi thus stood in a line with maverick scientists. He was shielded by a self-confident city state—a political force that frequently quarrelled with papal powers, and at times was at open war with them.

During a 3-year stint at Pisa, Malpighi also became a mentee and friend of Giovanni Borelli. This mathematician and polymath was one of the 'iatrophysicists ... convinced that physics provided the key to the body's operations'.³⁷ Besides his pioneering work in microscopy and plant biology, Malpighi's landmark contribution to cardiology took the form of two letters to Borelli, published as *De pulmonis* in 1661. In those he addressed an urgent question Harvey had avoided: How does arterial blood enter the venous system? Malpighi studied the lungs of frogs *in vivo*, and he could observe how in the capillary bed microscopic 'red globules' moved from arterioles to venules.³⁸ Soon after that, in 1667, Henry Oldenburg, the secretary of the Royal Society, invited Malpighi to correspondence. For his part, Oldenburg was a theologian and natural scientist with a European network of contacts. It included Leibnitz and Malpighi's fellow microscopist Jan Swammerdam. In Amsterdam, probably the most exciting, free-thinking place in Europe at the time, he corresponded with Baruch Spinoza—notably, Spinoza's (post-) Jewish philosophy effectively equated God and nature.

If his early career had been supported by the Duke of Tuscany, Malpighi later only seemingly allied with opposed political forces. In 1691, Pope Innocent XII invited him to become physician and professor at the Papal Medical School in Rome. Malpighi took up the offer and remained there until his death in 1694. It was a remarkable appointment, because the new, atomistic philosophy and methods met with fierce resistance by other physicians and attention by the Inquisition. In that sense, Innocent facilitated 'a great symbolic victory for the moderns'.³⁹ Malpighi's former student and assistant Giorgio Baglivi (1668–1707) continued research along the lines of mechanistic iatrophysics. In his 1699 *De Praxi Medica*, he noted that 'a human body ... is truly nothing else but a complex of chymico-mechanical motions, depending on such principles as are purely mathematical'.⁴⁰ Already Nils Stensen (1638–1682) had re-classified the heart. It may have been the central place of heat in the body, and 'the throne of the soul', he wrote. But 'in reality one finds nothing but a muscle'.⁴¹ Baglivi continued this work through extensive use of the microscope, discovering and describing the muscular structure of the heart.

Thus, 'nature' lost its legitimising function in this period, whether morally or politically. Reference to natural divine providence, let alone divine intervention in disease, became unconvincing. Reason marvelled at the new, microscopic worlds opening up before its eyes. Today, particularly Cartesianism is habitually criticised for a mind-body dualism, tearing apart the

human being. However, the expansion of the new science was flanked by a revival of intense spirituality. Trent Pomplun has thus rightly pointed out that ‘the (Catholic) Church, despite the protestations of traditionalists and progressives, arguably saw its most dramatic and successful period of *ressourcement* [re-reading of ancient theologians] and *aggiornamento* (accommodation to the present) in the sixteenth and seventeenth centuries’.⁴² The spiritual, corporate heart played a significant role in this.

Cardiolatry: Catholic spirituality in the age of reason

Baroque Catholic spirituality had its roots in the theological and political struggles of the sixteenth century. Catholic resurgence against the Reformation first peaked with the Council of Trent (1545–1563). The Council re-emphasised central tenets of the old faith, but went well beyond the Thomist medieval integration of nature and grace. This was most evident in the theology of the Eucharist, which, as for Augustine, answered the question: ‘Who are we?’ Tridentine teachings reaffirmed the *sacrificial*, even holocaustic nature of Christ’s death—and the Eucharist. To take part in it was to participate through an interruption of ordinary time and space in the very sacrifice on Mount Calvary.⁴³ It consisted not merely in giving up parts of oneself in gratitude (as Protestants were inclined to believe), but in giving without holding anything back, annihilating the *victima*—the individual self, possessions, one’s life. The Eucharist thus reformulated at Trent ‘made ordinary citizens holy’.⁴⁴ Politically, this was no mere theoretical speculation: ‘... contemporaries just assumed that religion lived at the heart of social life and that its beliefs bore direct implications for the nature of the proper ordering of society’.⁴⁵ The church shaken by the Reformation was thus reinstated as a hierarchical corporation mediating sanctity to its members—without any secular residue.

Developments in France were of particular significance for the spirituality of the heart. The Counter-Reformation’s leading figure there was Pierre de Bérulle, a fiercely anti-Huguenot priest, statesman and diplomat. His *Bref Discours de l’Abnégation intérieure* (1597) was a vow of holy slavery to Jesus and Mary. It was a Christ-centred spirituality, mystically drawing the mind via an abysmal self-abnegation into Christ’s glory: ‘In this state of subsistence you (Christ) are an abyss of marvels, a world of greatness, an abundance of eminent, rare and singular realities. You are the Center, the Circle, the Circumference of all the outer emanations of God!’⁴⁶ The heart became the meeting place between a person and God as well as the seat of affectivity. Indeed, the training of the affections was a major focus of religious and monastic (self-)discipline.

The relationship between Descartes and Bérulle remains contested. Did Descartes escape France because of the rising tide of religious, even superstitious factionalism?⁴⁷ Or did he align with Bérulle’s Augustinianism via Guillaume Ghibieuf?⁴⁸ The historical evidence points towards the latter, but is scarce. Either way, the thought of Bérulle and rationalist mechanism are two sides of the same (dualistic) coin. The mechanic skeleton of the body is the logical correlate of an intense, self-annihilating spirituality. Coming from different ends, both challenge nature as a legitimising ground of government and political form as such.

Together with Jacques Condren, Bérulle in 1611 founded the French Congregation of the Oratory, which started the ‘French School of Spirituality’. One of its disciples, the priest John Eudes, became the main promoter of the devotion to the Hearts of Mary and Jesus. Via Christ’s and one’s own suffering, the adoration of the *fleshy* heart of Jesus was the gateway into divine glory. Eudes’ efforts were multiplied in the 1670s, when

Marguerite Marie Alacoque (1648–1690), a young and it seems mentally frail nun at Paray-le-Monial in Burgundy, reported visions of the Sacred Heart. Alacoque in her ‘official’ autobiography later described how in an intensely vivid apparition Christ revealed his ‘divine Heart’ to her. The Heart was ‘so passionately fond of the human race, and in particular you’, that it could not ‘keep back the pent-up flames of its burning charity any longer’; they had to ‘burst out through you and reveal my Heart to the world, so as to enrich mankind with my precious treasures’. These, Alacoque wrote, were ‘all the graces of sanctification and salvation needed to snatch men from the very brink of hell’. For the nun, the response to such a gift of God could only be self-abnegation:

Next, he asked me for my heart. I begged Him to take it. He did, and place it in his own divine Heart. He let me see it there—a tiny atom being completely burned up in that fiery furnace. Then, lifting it out—now a little heart-shaped flame—he put it back where he had found it.⁴⁹

Alacoque’s visions and sombre ink-drawings had erotic, even occult overtones.⁵⁰ And as George Pattison has recently pointed out, they may well reflect psychosexual pathologies. The theological point, however, is the admission of complete (self-)displacement:

A wounded self is by definition a self that has lost sovereignty over its own body; it is a self that has become dependent on what is beyond its control, it is a self whose capacity for policing the boundaries between inner and outer has been significantly degraded, and ... (it is) a self stripped of social credit and, as such, excluded from the world of power and prestige.⁵¹

In line with Bérulle’s ‘Christocentric and theocentric emphases’, the devotion subsequently spread by Eudists and Jesuits combined ‘the abasement of the human self vis-à-vis the “grandeurs” of Jesus and the “majesty” of God’.⁵² Unsurprisingly, the relationship between the absolutist political apparatus and the ‘devotionalists’ was never straightforward: the latter’s ties to the Vatican presented a permanent challenge to the king’s absolute sovereignty.

Notably, France in the 17th century also held out a novel scientific epistemology of the heart. It is associated with the name of Blaise Pascal (1623–1662), a mathematical genius and child prodigy. At the age of 31, Pascal had an intense religious experience of the direct presence of God. ‘The heart has its reasons which reason does not know’, he wrote in fragment no. 431. He associated with the movement named after Cornelius Jansen (1585–1638). Following Augustine, the Jansenists sought a position on divine grace that is ‘evangelical but not Protestant, Catholic but not Jesuitical’.⁵³ It was much more austere in its outlook and tied to the domestic opposition to Louis XIV: the *parlements* (courts) and the lower clergy. Today, this heritage holds out an epistemology that is theologically grounded, non-reductionist and yet scientifically sound.⁵⁴

Mounting tensions: decadence, religious kitsch and Enlightened emancipation

Yet in science, Locke’s empiricism and Newtonian mechanics irreversibly gained the upper hand; Aristotelianism became a scientific-philosophical subcurrent. Indeed, Stephen Hales’ seminal contribution to cardiology consisted in mechanics: in 1733 he published his *Statistical essays, containing haemostat-icks*—a study of blood pressure and volumes, taking into account the elasticity of vessels and the effect of cold on the speed of

blood. The role of the emotions on the body changed; passions and humours became increasingly disjunct from alterations in the body. In the mid-18th century, then, Albrecht von Haller's *Elementa Physiologiae Corporis Humani* (1756–1766) united the strands of knowledge on the circulation of the blood.

Meanwhile, the early 18th century saw a proliferation of devotional piety in France and beyond. In 1722, Marseille, the city long regarded as a *pars pro toto* of France, was consecrated to the Sacré Coeur. Countless societies dedicated to the heart were founded. A flood of devotional images combined crude anatomical detail with religious kitsch. Similarly, Languet de Gergy's *Life of the Venerable Mother Marguerite-Marie* (1729) described Alacoque's encounters with 'her divine husband' and 'sweet master': "... on the day of their 'spiritual engagement' Jesus gave Alacoque to understand that he wished her to 'savor what was sweetest in the suavity of the caresses of his love'". These attentions were so 'excessive' and 'ravishing' that Alacoque was 'often beside herself' and the 'subject of a very strange confusion'.⁵⁵ As van Kley notes, the book was more romantic than devotional, 'more scandal than edification'. Aristocratic culture indulged in the lush splendour of ancient myths, all the while France was steering towards economic ruin.

The consolidation of absolutism was matched by rising forces of resistance from Jansenists and the Enlightenment. Especially Voltaire became infamous for his free-spirited, satirical polemics and anticlericalism (*Écrasez l'infâme!*—'Crush the loathsome thing!'), he would call towards the church.) It is no coincidence that he cited *Michael Servetus* as evidence for the rotten state of the Catholic and Protestant churches. Calvin, he said, had moved from dispute to insult, and 'from insults to that theological hatred, the most implacable of all hatreds'.⁵⁶

The French Revolution and the modern age

The French Revolution marked the political breakthrough of Enlightened notions of reason (although also an *empty* reason, as G.W.F. Hegel suggested). The absolutist order collapsed, and with it, royal Catholic religion. As Edmund Burke famously lamented: 'The age of chivalry is gone. ... Never, never more, shall we behold a generous loyalty to rank and sex, that proud submission, that dignified obedience, that *subordination of the heart*, which kept alive, even in servitude itself, the spirit of an exalted freedom'.⁵⁷ The revolutionaries mocked the Sacred Heart, which in turn became a counter-revolutionary symbol. Once again *nature* constituted a ground of political authority. The new heart of faith would be transformed by the Enlightenment, conscious of itself, shaped by natural sensibilities.

Revolutionary and counter-revolutionary hearts

The events of 1789 marked the beginning of a paradigm shift: the National Assembly constituted itself; in July, revolutionary crowds stormed the Bastille, and on 28 August the Declaration of the Rights of Man and Citizens was adopted. The First Republic in September 1792 could no longer tolerate a king. Robespierre insisted: 'Louis must die because the nation must live'.⁵⁸ On a cold morning in January 1793 Louis XVI was decapitated, an event that sent shock waves through Europe. It did not appease all revolutionary factions, however. The struggles descended into political paranoia, mass trials and executions that came to be known as the Reign of Terror. 'Like Saturn', the journalist Mallet du Pan observed, 'the Revolution devours its children'.

In July 1793, a few months after the decapitation of absolutism, Jean Paul Marat, a doctor and the editor of the journal *L'Ami du Peuple*, was stabbed in his bath. Marat was instantly

declared one of the Revolution's 'martyr heroes', and the cult of his heart became 'one of the most elaborate and celebrated mockeries of the Sacré-Coeur'.⁵⁹ The heart was removed from Marat's body and displayed in an urn formerly owned by the king. At a public ceremony in the Luxembourg Gardens the mock reliquary was put on display. Marat's eulogist exclaimed: 'O heart of Jesus! O heart of Marat! Sacred heart of Marat, sacred heart of Jesus, you have equal claim on our praise'. As Raymond Jonas tells it, 'The eulogy went on to offer comparisons of Marat with Jesus, of aristocrats with Pharisees, of the Apostles with the revolutionary Jacobins. The eulogist concluded with a phrase subordinating Jesus to Marat: "Jésus est un prophète et Marat est un dieu". Jesus is a prophet; Marat is a god'.⁶⁰ Later that year, Jacques David reverently painted *The Death of Marat* echoing Michelangelo's *Pietà*. Thus, recalling the wound of Christ, the picture both epitomised *and* turned against the 'impossibility of transcendence' in the new era.⁶¹

In reaction, the Sacred Heart played a central role in the counter-revolutionary tradition. The king himself was associated with the sacrifice of the sacred lamb⁶², a narrative which royalists in England had also woven around King Charles I (and which is well alive today⁶³). Later in 1793, the extension of the draft to the Revolutionary armies kindled resistance in the Vendée, western France. Soon it grew into a fully-fledged war. In Nantes, thousands were executed by drowning in the Loire. The revolutionary commander Jean-Baptiste Carrier cynically called it 'the national bathtub'. In response, the newly formed Catholic and Royal Armies increased their guerrilla activities. Their emblem: the Sacred Heart. For several decades the heart-symbol was associated with royalist restorationism and a European revival of piety. After the fall of the Vatican state in 1870, it became an expression of the Catholic Church's new claim to a global, but now entirely spiritual, authority: in 1899 Pope Leo XIII consecrated the entire world to the Sacred Heart of Jesus. Increasingly, it transformed into a *national* symbol for the aspirations to an older, more Christian France.⁶⁴

René Laënnec and Leopold Auenbrugger

The tensions of the revolutionary age are reflected in the life of René Laënnec (1781–1826), the inventor of the stethoscope. Laënnec grew up in Nantes, where a guillotine 'was within sight of the square and he witnessed several executions'.⁶⁵ After his medical studies at L'Hotel de Dieu at Nantes, he moved to Paris to enter L'École de Médecine. Here, he became an eager student of Jean-Nicolas Corvisart, later Napoléon's trusted primary physician). Corvisart had also re-discovered Leopold Auenbrugger's method of percussion (in Vienna, in 1761, Auenbrugger systematically described how the tissues and organs of the chest could be tested similarly to the levels of wine in casks). Laënnec's emerging devotion to Roman Catholicism around the turn of the century seemed somewhat out of time. Praised by royalists, his views largely contradicted those of his academic colleagues.⁶⁶ Yet parts of Catholicism had changed political alliances as well. Joseph Cardinal Fesch, the ambassador to the Vatican, was a half-brother of Napoléon (Napoléon claimed "I *am* the revolution", in the same year that he crowned *himself* Emperor⁶⁷). Laënnec served Fesch as physician until he was exiled after the fall of Napoléon. But he also took charge of the wards at the Salpêtrière Hospital, treating soldiers wounded in the Napoleonic Wars.

In 1816, Laënnec invented the stethoscope almost by accident. Examining an overweight woman who was 'labouring under general symptoms of diseased heart', he remembered the

augmented impression of sound when conveyed through certain solid bodies, as when we hear the scratch of a pin at one end of a piece of wood, in applying our ear to the other. Laënnec rolled up a bundle of papers into a cylinder and set them on the patient's chest; he was hardly surprised to hear much clearer sounds from inside the patient's torso.⁶⁸ Out of this humble episode developed a device still globally in use today. Laënnec's *Traité de l'Auscultation Médiante et des Maladies des Poumons et du Coeur* (1819) became a medical classic. He soon was made a full member of the French Academy of Medicine. An internationally renowned professor at the Charité in Paris, he attracted a steady stream of visitors. In August 1824, he was made a *chevalier* of the *Légion d'Honneur*. Thus, he became part of the post-Napoleonic civic and scientific elite. For Foucault, Laënnec played a key role in developing the 'medical gaze': besides its typologies and nomenclatures, technically mediated examinations such as auscultation created new human objects.⁶⁹

The relevance of the Revolution(s), including its (anti-)religious sentiments, for medicine cannot be overstated. New scientific methods replaced humoral pathology and ancient diagnostics such as uroscopy. Institutions formerly in the hands of the crown or the church were closed down, their property sold or taken over by the new nation-state. If the Revolution had been supported by many physicians, the new state-university represented the marriage of the ever-expanding scientific endeavour and political authority. *Education* would thus perpetuate the *national*, increasingly meritocratic body politic.

Romantics and bohemians

The Romantics and later the Bohemians absorbed these trends. For them, the heart carried scientific, melancholic, liberating, at times even anarchist connotations. In England, the Terror of the 1790s made formerly enthusiastic supporters of the French Revolution withdraw into the country. William Wordsworth's poem *My Heart Leaps Up* (1802) now located the heart within a 'natural piety' open to the marvellous regularities observed in science: "My heart leaps up when I behold/A rainbow in the sky;/So was it when my life began;/So is it now I am a man;/So be it when I shall grow old,/Or let me die!/The Child is father of the Man;/And I could wish my days to be/Bound each to each by natural piety". In France, literary iconoclasts such as Émile Zola abandoned their Catholic upbringing in search of a more genuine, melancholic sensitivity: his Rougon-Macquart series explored the influence of hereditary traits on his characters in a new, mercantilist republic. And Paul Verlaine in his *Romances sans Paroles* (1874) wrote: "The pain in my heart/Is like rain in the city. ... This pain has no reason in a heart that's heart-sick. What's this? No betrayal? My grief's without reason".⁷⁰ The heart here is theologically non-explicit, even muted.

The naturalistic imagination also weaves through the work of later 19th century scientists such as Wilhelm Conrad Roentgen (1845–1923). The physicist discovered 'X-rays' when preparing for photographic expedition into the countryside.⁷¹ Besides hunting, Roentgen was also fascinated by the mountains, especially the Alps.⁷² This widespread fascination at the time echoed the Romantics: nature and mountains stand tall as monumental, revelatory places of civilisational and imaginative transcendence. Today, this is once again attractive stance for Protestant theology seeking a position 'between materialism and metaphysics'.⁷³ Like Wordsworth's, Roentgen's political leanings were far from revolutionary. Although he had seen the good sides of a republic in Switzerland, he cautiously preferred a parliamentary monarchy.⁷⁴

CONCLUSION

The 21st century tendencies—myths, genomics and ancient yearnings

In subtle ways, the different theological grounds of the science and symbolism of the heart persist. Pop-culture encapsulates the revolutionary and postrevolutionary motifs of the *bohème*. It has become the commercial mainstream, Madonna's 2015 album *Rebel Heart* being a point in case. Old political contexts recur in new guises as well (nothing is ever over). Take the case of *Charlie Hebdo*: in 2011 the magazine lampooned conservative Sacred-Heart admirers (cover: *'Le dîner de cons'*). It is one of the greatest ironies of the early 21st century that the staff of a French magazine consisting of avowed communists, atheists and admirers of Verlaine (via the chansonnier Léo Ferré) had to make the ultimate, bloody sacrifice for their work—recalling Servetus as well as Bérulle.

As for the material or 'natural' philosophy underlying cardiology, Denton Cooley noted in 2004 that most of the technical, surgical progress has been made. The new frontiers are less and less invasive diagnostics. Genetics and -omics delve deeper into the hereditary aspect of the human being. Research in cardiology, as in other parts of medicine, has become a form of Big Data analysis, that is: statistics. If money was the blood of Hobbes' early modern state, we are now moving into a more fragmented and inflated age (certainly in monetary terms). Data are 'the new oil', the new money, the new blood in the body of what Barbara Prainsack has called the 'iLeviathan'; it is the doubling and simultaneous dissolution of the body politic in a digital sphere.⁷⁵ The reactivation of polytheistic *myths* (such as invocation of Cura by Julia Kriseva *et al*) perfectly fits, and to an extent supports, this political-scientific constellation. Yet the appeal to such myths seems arbitrary, even though it is emotionally evocative.⁷⁶ Whether the heart will again be a fountain of a genuine, non-political body politic or an epistemological ground for science remains to be seen. It certainly is a possibility.

Acknowledgements The author would like to thank the participants of the Flavell Symposium at the Apothecaries Society, London, in June 2017. The author would also like to thank the Sir Halley Stewart Trust, which funded some of the activities leading to this collection of papers. This paper was finalised as part the author's work within DigiMed, a research project funded by the Bavarian State Ministry of Health and Care (StMG), Germany; the author is grateful both for the funding and support from within this project.

Contributors There are no contributors to the article.

Funding The author's work was initially funded through the Healthcare Values Partnership, University of Oxford. The paper was finalised as the author was funded by the Bavarian State Ministry of Health and Care.

Disclaimer The views expressed are those of the author and not necessarily those of the Sir Halley Stewart Trust or the Bavarian State Ministry of Health and Care.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. There are no data involved in this research, as it is literature-based. No patients were involved in this research.

NOTES

1. Joshua Hordern (2020), 'The haunted heart and the Holy Ghost: on retrieval, donation and death' (2020).
2. Ole M Høystad (2007), *A History of the Heart*, Ebook Central (London: Reaktion, 2007).
3. Fay Bound Alberti (2010), *Matters of the Heart: History, Medicine, and Emotion* (New York; Oxford: Oxford University Press, 2010).

4. Julia Kristeva et al. (2018), "Cultural Crossings of Care: An Appeal to the Medical Humanities," *Medical Humanities* 44, no. 1 (2018).
5. George Hardin Brown, (2009), "From the Wound in Christ's Side to the Wound in His Heart: Progression from Male Exegesis to Female Mysticism." In *Poetry, Place, and Gender: Studies in Medieval Culture in Honor of Helen Damico*, edited by E. Catherine, and Helen Damico Karkov, 252–74. Kalamazoo: Medieval Institute Publications/ Western Michigan University, 2009.
6. John St Chrysostom (1963), *Baptismal Instructions*, trans. Paul W. Harkins, Ancient Christian Writers (Westminster, Maryland: Newman Press, 1963), 61.
7. *Ibid.*, 62.
8. Hippo, St Augustine of (1995), *Tractates on the Gospel of John 112-24: Tractates on the First Epistle of John*, trans. John W. Rettig, Fathers of the Church (Washington, District of Columbia Catholic University of America Press, 1995), 50.
9. Auguste Hamon (1937–1955), "Sacré-Coeur," in *Dictionnaire de Spiritualité: Ascétique et Mystique: Doctrine et Histoire*, ed. Marcel; Cavallera Viller, Ferdinand, SJ; de Guibert, Joseph (Paris: G. Beauchesne, 1937–1955), 1027.
10. Veronica Mary Rolf (2013), *Julian's Gospel: Illuminating the Life and Revelations of Julian of Norwich* (Maryknoll, New York: Orbis Books, 2013), 374-75.
11. St Thomas Aquinas (1999), *De Motu Cordis*, trans. Gregory L. Froelich, Aquinas Translation Project (Center Valley, Pennsylvania: DeSales University, 1999), 1270-71; Vincent R Larkin (1960), "St Thomas Aquinas on the Movement of the Heart," *Journal of the History of Medicine and Allied Sciences* XV, no. 1 (1960); Heather Webb (2010) *The Medieval Heart* (New Haven; London: Yale University Press, 2010).
12. Hanns-Gregor Nissing (2017), "Der Mensch ist nicht als ganzer und mit allem hingeordnet auf die politische Gemeinschaft, ... sondern auf Gott." Weltliche und geistliche Herrschaft bei Thomas von Aquin," in *Die Bestimmung des Menschen und die Bedeutung des Staates: Beiträge zum Staatsverständnis des Thomas von Aquin*, ed. Rolf Schönberger (Baden-Baden: Nomos, 2017).
13. Martin Luther (2020), *Eyn Sermon von der Betrachtung des heyligen Leydens Christi*, vol. WA 2, Schriften 1518/19, D. Martin Luthers Werke (Weimar: Weimarer Ausgabe, 1519), 137.
14. *Ibid.*, 140.
15. Therese Feiler (2018), "Understanding Responsibilization in Healthcare: Differentiations in Reformation Theology," *Theology* 121, no. 2 (2018).
16. cit. in Fredrick A Willius and Thomas Jan Dry (1948), *A History of the Heart and the Circulation* (Philadelphia; London: Saunders, 1948), 286.
17. Willius and Dry, *A History of the Heart and the Circulation*, 279.
18. Michael Servetus (2007), *Wiederherstellung des Christentums*, trans. Bernhard Spieß, vol. 1 (Leipzig: Superbia-Verlag, 2007 [1553]).
19. *ibid.*, 177-89.
20. Mirjam van Veen (2017), "Dutch Anabaptist and Reformed Historiographers on Servetus' Death: Or How the Radical Reformation Turned Mainstream and How the Mainstream Reformation Turned Radical."
21. Ralf Bröer (2006), "Blutkreislauf und Dreieinigkeit. Medizinischer Antitrinitarismus von Michael Servet (1511–1553) bis Giorgio Biandrata (1515–1588)," *Berichte zur Wissenschaftsgeschichte* 29, no. 1 (2006).
22. Mirjam van Veen (2015), *Die Freiheit des Denkens* (Essen: Alcorde Verlag, 2015).
23. See, for example, William H Drummond (1848), *The Life of Michael Servetus: The Spanish Physician, Who, for the Alleged Crime of Heresy, Was Entrapped, Imprisoned, and Burned by John Calvin the Reformer, in the City of Geneva, October 27, 1553* (London: John Chapman, 1848).
24. William Osler (1909), *Michael Servetus* (London: H. Frowde, 1909); G N Cattermole (2000), "Hero and Heretic: William Osler's Interest in Michael Servetus," *Journal of Medical Biography* 8, no. 4 (2000).
25. Thanos Christopoulos (2011), "From Sacrifice to Science: Servetus between Joseph De Maistre and Francis Bacon," in *Michael Servetus, Heartfelt: Proceedings of the International Servetus Congress, Barcelona, 20-21 October, 2006* (Lanham: University Press of America, 2011); Mirjam van Veen (2015) "Dutch Anabaptist and Reformed Historiographers on Servetus' Death: Or How the Radical Reformation Turned Mainstream and How the Mainstream Reformation Turned Radical," in *Radicalism and Dissent in the World of Protestant Reform*, ed. Bridget; Kremers Heal, Anorthe (Göttingen: Vandenhoeck & Ruprecht, 2017).
26. HH Kruyswijk and W van Hoon (2008), "Letter to the Editor: Michael Servetus (1511-1553) Did Not Discover the Lesser Circulation," *Netherlands Heart Journal* 16, no. 7-8 (2008).
27. I James and VI King (1994), *Political Writings*, Cambridge Texts in the History of Political Thought (Cambridge: Cambridge University Press, 1994), 136.
28. *Ibid.*, 140.
29. *Ibid.*, 140-41.
30. Karl Ernst von Mühlendahl (2006), *William Harveys Von Der Bewegung Des Herzens: Die Geburt Einer Idee* (Norderstedt: Books on Demand, 2006), 36; 40.
31. William Harvey (1958), *Exercitatio Anatomica De Motu Cordis Et Sanguinis in Animalibus*, trans. Chauncey D. Leake (Springfield, Ill: Charles C. Thomas, 1958 [1628]), 68-69.
32. von Mühlendahl, *William Harveys Von Der Bewegung*, 97.
33. Christoffer Basse Eriksen (2017), "Circulation of Blood and Money in Leviathan—Hobbes on the Economy of the Body," in *History of Economic Rationalities: Economic Reasoning as Knowledge and Practice Authority*, ed. Jakob Bek-Thomsen, et al. (Cham: Springer International Publishing, 2017).
34. Thomas Fuchs (2001), *The Mechanization of the Heart: Harvey and Descartes*, trans. Marjorie Grene, Rochester Studies in Medical History (Rochester, New York: University of Rochester Press, 2001).
35. Maria Pia Donato (2016), *Sudden Death: Medicine and Religion in Eighteenth-Century Rome* (London; New York: Routledge, 2016), 56-58.
36. Heather Webb (2010), *The Medieval Heart*.
37. Roy Porter (2004), *Flesh in the Age of Reason: How the Enlightenment Transformed the Way We See Our Bodies and Souls* (London: Penguin, 2004), 52.
38. Lynn D Lorinaux (2010), "Historical Note: Marcello Malpighi (1628–1694)," *The Endocrinologist* 20, no. 2 (2010).
39. Maria Pia Donato (2016), *Sudden Death: Medicine and Religion in Eighteenth-Century Rome*, 57.
40. Porter, *Flesh in the Age of Reason: How the Enlightenment Transformed the Way We See Our Bodies and Souls*, 53.
41. von Mühlendahl, *William Harveys Von Der Bewegung*, 113.
42. Trent Pomplun (2015), "Early Modern Catholic Theology (1500–1700)" in *The Oxford Handbook of Catholic Theology*, ed. Lewis; Volpe Ayres, Medi-Ann (Oxford: Oxford University Press, 2015).
43. Ivan Strenski (2002), *Contesting Sacrifice: Religion, Nationalism, and Social Thought in France* (Chicago; London: University of Chicago Press, 2002), 14.
44. *Ibid.*, 15.
45. *Ibid.*
46. Pierre de Bérulle (1995), *Discours De L'État Et Des Grandeurs De Jésus, I*, ed. Michel; Piédagnel Dupuy, Auguste; Morgain, Stéphane-Marie; Lescot, Rémi; Join-Lambert, Michel; Beaudé, Joseph; Delahaye, Blandine, vol. 7, Œuvres De Pierre De Bérulle (Paris: Oratoire de Jésus: Editions du Cerf, 1995), 117.
47. Richard Watson (2007), *Cogito, Ergo Sum: The Life of René Descartes* (Boston: David R. Godine, 2007), 141-43.
48. Hanoch Ben-Yami (2015), *Descartes' Philosophical Revolution: A Reassessment* (London: Palgrave Macmillan, 2015); Fred Ablondi (2015), "Bérulle, Pierre De (1575–1629)," in *The Cambridge Descartes Lexicon*, ed. Lawrence Nolan (Cambridge: Cambridge University Press, 2015).
49. Marguerite Marie Alacoque (1961), *The Autobiography of Saint Margaret Mary*, trans. Vincent Kerns (Westminster, Maryland: Newman Press, 1961), 44-45.
50. David Morgan (2008), *Sacred Heart of Jesus: The Visual Evolution of a Devotion*, Meertens Ethnology Cahier (Amsterdam: Amsterdam University Press, 2008), 43.
51. George Pattison (2018), *A Phenomenology of the Devout Life* (Oxford: Oxford University Press, 2018), 158.
52. Dale K Van Kley (1996), *The Religious Origins of the French Revolution: From Calvin to the Civil Constitution, 1560-1791* (New Haven; London: Yale University Press, 1996), 115.
53. Gerald R Cragg, 1990, *The Church and the Age of Reason, 1648-1789*, Repr. in Penguin books. ed., Penguin History of the Church (Harmondsworth: Penguin, 1990), 26.
54. Markus Knapp (2014), *Herz und Vernunft, Wissenschaft und Religion* (Paderborn: Schöningh, 2014); James R Peters (2009), *The Logic of the Heart: Augustine, Pascal, and the Rationality of Faith* (Grand Rapids, Michigan: Baker Academic, 2009).
55. Van Kley, *The Religious Origins of the French Revolution: From Calvin to the Civil Constitution, 1560-1791*, 116.
56. François-Marie Voltaire (1778), *Essai Sur Les Mœurs Et L'Esprit Des Nations*, Edition Garnier ed. (Paris: ed. Garnier, 1878), 306-07.
57. Edmund Burke (1814), *Reflections on the Revolution in France* (Apollo Press, 1814), 77.
58. Sylvia Neely (2008), *A Concise History of the French Revolution* (Rowman & Littlefield Publishers, 2008), 169.
59. Raymond Jonas (2000), *France and the Cult of the Sacred Heart: An Epic Tale for Modern Times* (University of California Press, 2000), 129.
60. *Ibid.*
61. Timothy J Clark (2001), *Farewell to an Idea: Episodes from a History of Modernism* (New Haven; London: Yale University Press, 2001), 23.
62. Strenski, *Contesting Sacrifice: Religion, Nationalism, and Social Thought in France*, 43.

63. Christopher Taylor (2019), "King Charles the Martyr," *London Review of Books*, 21 February 2019.
64. Claudia Schlager (2011), *Kult und Krieg: Herz Jesu—Sacré Cœur—Christus Rex im deutsch-französischen Vergleich 1914-1925* (Tübingen: Tübinger Vereinigung für Volkskunde, 2011); Miguel Rodriguez (1998), "Du Vœu Royal Au Vœu National," *Cahiers du Centre de Recherches Historiques*, no. 21 (1998).
65. Willius and Dry, *A History of the Heart and the Circulation*.
66. Kara Rogers and Ariel Roguin (1998) "René Laënnec," in *Encyclopædia Britannica* (1998).
67. Johannes Willms (2009), *Napoleon: Eine Biographie* (München: C. H. Beck, 2009), 775.
68. Willius and Dry, *A History of the Heart and the Circulation*.
69. Michel Foucault (1963), *The Birth of the Clinic: An Archaeology of Medical Perception* (London; New York: Routledge, 2003 [1963]), 132, 65.
70. Paul Verlaine (2019), *Paul Verlaine: A Bilingual Selection of His Verse*, trans. Samuel N. Rosenberg (Pennsylvania State University Press, 2019), 99.
71. Willius and Dry, *A History of the Heart and the Circulation*, 237.
72. Dieter Voth (2003), *Nach Der Jäger Weise: Wilhelm Conrad Röntgen, Forscher Und Jäger: Biographie Mit Bildern Und Dokumenten* (Oldenburg: Igel-Verlag Literatur, 2003).
73. Jörg Lauster (2016), "Der Berg ruft – Eine Christologie der Alpen zwischen Materialismus und Metaphysik," *Neue Zeitschrift für Systematische Theologie und Religionsphilosophie* 58, no. 4 (2016).
74. Voth, *Nach der Jäger Weise*, 93.
75. Barbara Prainsack (2019)
76. Kristeva, "Cultural Crossings of Care: An Appeal to the Medical Humanities."
77. Kara Rogers and Ariel Roguin, 1998
- Fuchs, Thomas. "The Mechanization of the Heart: Harvey and Descartes. [in eng]." In *Rochester Studies in Medical History*, edited by Marjorie Grene. Rochester, New York: University of Rochester Press, 2001.
- Hamon, Auguste. "Sacré-Cœur." In *Dictionnaire de Spiritualité: Ascétique et Mystique: Doctrine et Histoire*, edited by Marcel; Cavallera Viller, S. J Ferdinand, and Joseph de Guibert, 1023–46. Paris: G. Beauchesne, 1937–1955.
- Harvey, William In. *Exercitatio Anatomica De Motu Cordis Et Sanguinis in Animalibus*, edited by Chauncey D Leake. Springfield, Illinois: Charles C. Thomas, 1958.
- Hippo, St Augustine of. "Tractates on the Gospel of John 112-24: Tractates on the First Epistle of John. [in eng]." In *Fathers of the Church*, edited by John W Rettig. Washington, District of Columbia: Catholic University of America Press, 1995.
- Hordern, Joshua. "The haunted heart and the Holy ghost: on retrieval, donation and death." *Medical humanities* 46, no. 4 (2020), medhum-2020-011870: 372–81
- Høystad, Ole M. *A History of the Heart. [in eng]*. London: Reaktion, 2007.
- James, I, and VI King. *Political Writings. [in eng]* Cambridge Texts in the History of Political Thought. Cambridge: Cambridge University Press, 1994.
- Jonas, Raymond. *France and the Cult of the Sacred Heart: An Epic Tale for Modern Times*. Berkeley, California: University of California Press, 2000.
- Knapp, Markus. *Herz und Vernunft, Wissenschaft und Religion*. Paderborn: Schöningh, 2014.
- Kristeva, Julia, Marie Rose Moro, John Ødemark, and Eivind Engebretsen. "Cultural crossings of care: an appeal to the medical humanities." *Medical Humanities* 44, no. 1 (2018): 55–8.
- Kruyswijk, HH, and W van Hoorn. "Letter to the Editor: Michael Servetus (1511–1553) Did Not Discover the Lesser Circulation [in eng]." *Netherlands Heart Journal* 16 (2008): 284–5.
- Larkin, Vincent R. "St Thomas Aquinas on the movement of the heart." *Journal of the History of Medicine and Allied Sciences* XV, no. 1 (1960): 22–30.
- Lauster, Jörg. "Der Berg ruft – Eine Christologie Der Alpen zwischen Materialismus und Metaphysik." *Neue Zeitschrift für Systematische Theologie und Religionsphilosophie* 58, no. 4 (2016): 435–52.
- Lorinaux, Lynn D. "Historical note: Marcello Malpighi (1628–1694)." *The Endocrinologist* 20, no. 2 (2010), 45.
- Luther, Martin. *Eyn Sermon Von Der Betrachtung Des Heyligen Leydens Christi. D. Martin Luthers Werke. Vol. WA 2, Schriften 1518/19, 1519*. Weimar: Weimarer Ausgabe, 2020.
- Morgan, David. *Sacred Heart of Jesus: The Visual Evolution of a Devotion. [in eng]* Meertens Ethnologie Cahier. Amsterdam: Amsterdam University Press, 2008.
- Neely, Sylvia. *A Concise History of the French Revolution*. Plymouth: Rowman & Littlefield Publishers, 2008.
- Nissing, Hanns-Gregor. "Der Mensch Ist Nicht Als Ganz Und Mit Allem Hingeordnet Auf Die Politische Gemeinschaft, ... Sondern Auf Gott. Weltliche Und Geistliche Herrschaft Bei Thomas Von Aquin." In *Die Bestimmung Des Menschen Und Die Bedeutung Des Staates: Beiträge Zum Staatsverständnis Des Thomas Von Aquin*, edited by Rolf Schönberger, 131–70. Baden-Baden: Nomos, 2017.
- Osler, William. *Michael Servetus*. London: H. Frowde, 1909.
- Pattison, George. *A Phenomenology of the Devout Life*. Oxford: Oxford University Press, 2018.
- Peters, James R. *The Logic of the Heart: Augustine, Pascal, and the Rationality of Faith. [in eng]*. Grand Rapids, Michigan: Baker Academic, 2009.
- Pomplun, Trent. "Early Modern Catholic Theology (1500–1700)." In *The Oxford Handbook of Catholic Theology*, edited by Lewis Volpe Ayres. Oxford: Oxford University Press, 2015.
- Porter, Roy. *Flesh in the Age of Reason: How the Enlightenment Transformed the Way We See Our Bodies and Souls. [in eng]*. London: Penguin, 2004.
- Prainsack, Barbara. "Data Donation: How to Resist the iLeviathan." In *The Ethics of Medical Data Donation*, edited by Jenny Krutzinna, and Luciano Floridi, 9–22. Cham: Springer International Publishing, 2019.
- Rodriguez, Miguel. "Du Vœu Royal Au Vœu National." [In fre]: Cahiers du Centre de Recherches Historiques, 1998.
- Rogers, Kara, and Ariel Roguin. "René Laënnec." *Encyclopædia Britannica* (1998).
- Rolf, Veronica Mary. *Julian's Gospel: Illuminating the Life and Revelations of Julian of Norwich*. Maryknoll, New York: Orbis Books, 2013.
- Schlager, Claudia. *Kult und Krieg: Herz Jesu—Sacré Cœur—Christus Rex im deutsch-französischen Vergleich 1914–1925*. Tübingen: Tübinger Vereinigung für Volkskunde, 2011.
- Servetus, Michael In. *Wiederherstellung des Christentums*, edited by Bernhard Spieß. Leipzig: Superbia-Verlag, 2007.
- St Chrysostom, John. "Baptismal Instructions. [in eng]." In *Ancient Christian Writers*, edited by Paul W Harkins. Westminster, Maryland: Newman Press, 1963.
- Strenski, Ivan. *Contesting Sacrifice: Religion, Nationalism, and Social Thought in France. [in eng]*. Chicago; London: University of Chicago Press, 2002.
- Taylor, Christopher. *King Charles the Martyr*. London Review of Books, 2019.
- Van Kley, Dale K. *The Religious Origins of the French Revolution: From Calvin to the Civil Constitution, 1560–1791. [in eng]*. New Haven; London: Yale University Press, 1996.
- van Veen, Mirjam. "Dutch Anabaptist and Reformed Historiographers on Servetus' Death: Or How the Radical Reformation Turned Mainstream and How the Mainstream

- Reformation Turned Radical." *Radicalism and Dissent in the World of Protestant Reform* edited by, 162–72. Göttingen: Vandenhoeck & Ruprecht, 2017.
- Veen, Mirjam van. *Die Freiheit des Denkens*. Essen: Alcorde Verlag, 2015.
- Verlaine, Paul In. *Paul Verlaine: A Bilingual Selection of His Verse*, edited by Samuel N Rosenberg: Pennsylvania State University Press, 2019.
- Voltaire, François-Marie In. *Essai sur les Mœurs et l'Esprit des Nations*, edited by Edition Garnier. Paris: Garnier, 1878.
- von Mühlendahl, Karl Ernst. *William Harveys Von der Bewegung des Herzens: Die Geburt einer Idee*. Norderstedt: Books on Demand, 2006.
- Voth, Dieter. *Nach Der Jäger Weise: Wilhelm Conrad Röntgen, Forscher Und Jäger: Biographie Mit Bildern Und Dokumenten*. Oldenburg: Igel-Verlag Literatur, 2003.
- Watson, Richard. *Cogito, Ergo Sum: The Life of René Descartes*. Boston: David R. Godine, 2007.
- Webb, Heather. *The Medieval Heart*. [in eng]. New Haven; London: Yale University Press, 2010.
- Willius, Fredrick A, and Thomas Jan Dry. *A History of the Heart and the Circulation*. [in eng]. Philadelphia; London: Saunders, 1948.
- Willms, Johannes. *Napoleon: Eine Biographie*. München: C. H. Beck, 2009.