

# The ‘bloody Moloch’: Osler and van Helmont on bloodletting

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In a passage on the treatment of pneumonia, Osler quoted van Helmont's remark that ‘a bloody Moloch presides in the chairs of medicine’. This paper explores Helmont's use of ‘Moloch’ as a term of abuse against the bloodletting of traditional Galenist physicians and his vigorous opposition to the use of bleeding in treating diseases. The possible reasons for Helmont's opposition to the practice of bloodletting are discussed, leading to the conclusion that it

arose from his theories of the origin of diseases, reinforced by some observations of its malign effects on a patient who had been bled excessively. The question of whether Helmont knew of Harvey's discovery of the circulation of the blood is explored and the conclusion reached that, if he did, he ignored it completely. Helmont believed that ‘pure’ and ‘impure’ blood coexisted in disease and could be affected selectively by bloodletting which, in effect, concentrated the ‘impure’ at the expense of the ‘pure’ blood to the great detriment of the patient.

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## van Helmont, Osler and blood letting

In his posthumous *Ortus medicinæ* of 1648<sup>1</sup> Joan Baptista van Helmont famously proposed a ‘trial’ of the treatment of fever with and without bloodletting. I have discussed this proposal for a trial<sup>2</sup> and shown that we can be confident that no such trial ever took place. Nevertheless, Helmont became famous as a bitter opponent of bloodletting and, since bleeding was almost universally employed for almost any malady in the 17th century, it seems worth exploring the reasons for Helmont's opposition to it.

The great physician William Osler, who practised in the 19th and early 20th centuries, was one of those who drew attention to Helmont's fierce rejection of venesection. Osler, however, was a firm advocate of early bleeding in the treatment of (lobar) pneumonia and of other conditions. Thus, in the third (1898) edition of his textbook Osler<sup>3</sup> wrote, regarding bleeding in the treatment of pneumonia:

The reproach of Van Helmont, that ‘a bloody Moloch presides in the chairs of medicine,’ can not be brought against this generation of physicians. Before Louis' iconoclastic paper on bleeding in pneumonia it would have been regarded as almost criminal to treat a case without venesection. We employ it nowadays much more than we did a few years ago, but more often late in the disease than early. To bleed at the very onset in robust, healthy individuals in whom the disease sets in with great

intensity and high fever is, I believe, a good practice. I have seen instances in which it was very beneficial in relieving the pain and the dyspnoea, reducing the temperature, and allaying the cerebral symptoms. (Osler<sup>3</sup> p. 135)

The content of Osler's section on pneumonia changed in successive editions of his textbook. Though he mentions the ‘Bloody Moloch’ from the first edition in 1892, the reference to Louis's ‘iconoclastic paper’ (of 1835) does not appear until the third edition of 1898. The final (eighth) edition of 1916 contains the same text about the ‘Bloody Moloch’ as does the third edition.

So Osler was by no means opposed to the use of bloodletting in pneumonia – he recommended it as late as 1916. Indeed, in what was to prove the final edition of Osler's book in 1935, by then long edited by MacCrae (Osler had died in 1919), the advice ‘...to bleed at the very onset...’ of pneumonia was unchanged from that in the early editions. In those editions we find that Osler recommended purging as well as bloodletting in cardiac failure and in other disorders of the circulation as well as in pneumonia. One might conclude that, apart from the use of digitalis, Osler's practice both in pneumonia and in cardiac failure with peripheral oedema (‘dropsy’) differed from that of Galenic practice in the 17th century mainly in that Osler was more circumspect about repeated bloodletting and violent purging than the Galenists had been.

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## Therapeutic bloodletting in the 21st century

Bloodletting may still be used very occasionally in acute cardiac failure with very severe dyspnoea, which it does relieve, at least temporarily. But now that rapidly-acting powerful diuretics are available for intravenous administration, venesection is rarely necessary and, though it provides rapid relief of dyspnoea, this relief is temporary and the resultant drop in haemoglobin is a considerable disadvantage. The principal uses of bloodletting now are to reduce excessive levels of stored iron, for example in haemochromatosis and *porphyria cutanea tarda* and excess of red cells in polycythaemia.<sup>4</sup> In a sense one may regard these uses as a formal parallel with the Galenic opinion that bloodletting was appropriate in any *plethora*. What has changed is the nature of the excess constituting the plethora.

Though Osler recommended bloodletting in several conditions in which it was desirable to reduce the cardiac load by reducing the venous return, he pointed out that Helmont was vehemently opposed to bleeding but, as we shall see, his remark about the ‘bloody Moloch’ quotes Helmont somewhat out of context.

## Moloch

Why Moloch? Moloch or Molech or Molek – all varieties of transliteration of a Hebrew word – appears several times in the Old Testament as the name of a god, probably a Canaanite deity, to whom children were sacrificed, perhaps by being thrown or dropped into a fire in, or in front of, his idol. The practice was denounced by the prophets as abominable. Also in the Old Testament, the cult of Moloch was associated with a site in the Hinnom valley near Jerusalem. The Greek version, Gehenna, of the Aramaic name for this valley eventually became a name for hell because of its association with fiery sacrifices to the underworld god Moloch. Day’s article in *Religion Past and Present*<sup>5</sup> presents some conclusions of modern scholarship on the Moloch cult but rather obscures the amount of disagreement among scholars. Since the 17th century the worship of Molech/Molek has attracted much attention by archaeologists and philologists as well as biblical scholars. For a view of the complexity, and difficulty, of the arguments and a comprehensive historical overview of the scholarship see Heider’s 1984 Yale thesis.<sup>6</sup> But, taking account of the differences in the transliteration of Hebrew names by early biblical commentators and by modern scholars, the commentary of Jerome (ca. 347–420 AD) on Jeremiah,<sup>7</sup> is probably a reasonable approximation to what Helmont believed about Moloch and his worship. Jerome was the principal compiler of the 4th century Latin translation of the Bible which later became known as the Vulgate. For more information on Jerome’s commentary and a 17th century description of the Valley of Hinnom (Gehinnom/Gehinnon, Ben-Hinnom) see the Appendix.

A little after Helmont, Milton echoed all these grim associations in *Paradise Lost*:

**Figure 1** An 18th century illustration of how Moloch was imagined, probably based on mediæval Rabbinical commentary. ‘The Idol Moloch. How the children were put in his fiery arms as offerings.’ From a book on Jewish religious practices.<sup>19</sup> Image courtesy of Universitätsbibliothek, Goethe Universität, Frankfurt am Main. Compare this image with the description given by Sandys – see Appendix



First MOLOCH, horrid King besmear'd with blood  
Of human sacrifice, and parents tears,  
Though, for the noyse of Drums and Timbrels loud,  
Their children's cries unheard that passed through fire  
To his grim Idol.

.....

..... and made his Grove

The pleasant Vally of HINNOM, TOPHET thence  
And black GEHENNA call'd, the Type of Hell.

What is not entirely clear, however, is why Helmont, and indeed Milton, described Moloch as ‘bloody’. Osler’s quotation of Helmont is probably a slight paraphrase of Chandler’s translation of Helmont’s Latin which will be discussed below in more detail. For the moment, let us consider just the ‘bloody’ attribution. Helmont wrote: ‘At certe cruentum Moloch, Cathedris praesidere conspicuo medicis’ (‘For I see a bloody Moloch to preside in the chairs of medicine’). The Latin adjective translated as ‘bloody’ is *cruentum*. This adjective translates as bloody in two related, but distinct, senses. First it may mean bloody in the literal sense – covered, soaked or spotted with blood. But it may also mean bloody in a figurative sense indicating cruelty or bloodthirstiness. In the context of Helmont’s use it can be taken in either sense – or, indeed, in both. Milton’s use ‘besmeared with blood of human sacrifice’ seems unequivocally literal and does not appear to have any basis in Old Testament scripture. Later, in English lay writing of the 18th and 19th centuries, Moloch was used to signal butchery, usually metaphorical, and especially, but not exclusively, of children.

Given its associations it is not difficult to see why Helmont – a devout Catholic Christian to whom the text of the Vulgate would have been familiar – chose Moloch as a term to condemn as bloodthirsty and eager for sacrifice of human life the addiction of the Galenists (his ‘Humorists’) to bleeding their patients.

Helmont refers to ‘Moloch’ in an introductory chapter describing his studies in the *Ortus medicinæ*, published posthumously in 1648 by his son.<sup>1</sup> Having seen, he says, that God has not revealed to the Schools (of medicine) any useful means of healing fevers he asks (p.19) ‘An tibi placet holocaustum Moloch?’ – ‘Is the sacrifice of Moloch pleasing to thee?’ (translated thus in Chandler’s English translation of the *Ortus, Oriatrike*<sup>8</sup> in 1662, p. 14). A closer translation would be ‘Is the burnt offering to Moloch pleasing to thee?’ But, more specifically, Helmont uses Moloch as a term of derision at least twice in his writings, in chapter 56 of the *Ortus medicinæ* and in chapter 7 of *Febrium doctrina inaudita*<sup>9</sup> – one of his *Opuscula*, first published in 1642 and reissued in a second edition with the *Ortus* in 1648. Though on the title page of the *Opuscula* the treatise on fevers is called *Febrium doctrina inaudita* (‘Unheard [of] principles of fevers’), on the title page of the treatise itself it is called simply *De febribus* and it is this title that Chandler used in his English translation in the *Oriatrike*, calling it ‘A treatise of fevers’.

### Moloch in the *Ortus medicinæ*

The reference to Moloch is in the chapter *Pleura furens* (Helmont<sup>1</sup> p. 390 ff). Chandler,<sup>8</sup> in his translation of the *Ortus (Oriatrike, 1662)* renders *Pleura furens* as ‘A Raging or Mad Pleura’ – a fair translation of the words, though perhaps not a very illuminating description of the condition.

The reference to a ‘raging’ pleura arises from Helmont’s view of the causation of disease. Briefly, he considered that the body was controlled by a resident semi-psychic entity, the *Archeus influus* or governor, which regulated all its functions. In addition, each organ had its own local archeus (*Archeus insitus*) which regulated its local nutrition. Diseases were caused by *semina morbida* (morbid seeds) each of which had its own archeus that included an ‘image’ of the result it ‘wished’ to produce. The *archei* of the *semina* ‘confronted’ the body’s archeus, which reacted with rage or horror; the result of this rage, in turn, was to ‘conceive’ a distorted image. As a result, the functions of the body’s archeus were deranged, causing the disease specific to the particular *semen* which had confronted the archeus. Thus, in this case, the *Archeus insitus* of the pleura was enraged – ‘raging’ – because of its confrontation by the *semen* of pleural disease; hence the description of the disease as a ‘raging or mad pleura’. My paper<sup>2</sup> on Helmont’s proposed trial attempts to summarise Helmont’s theories of disease and refers to works which set out much more comprehensive descriptions and interpretations of his complex and convoluted theories.

From the descriptions in the text it is clear that, in *Pleura furens*, Helmont is speaking primarily of what would now be

called pleurisy, pleuro-pneumonia and pneumonia – though, characteristically, he digresses a good deal along the way in his attacks on the wicked Galenists and their bloodletting. The Moloch reference is in one of these digressions, on the bloody flux.

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.....

Clysterem vero, quia intestine peregrinum, dolore. Idcirco in dysenteria nocuum. Error iste fluit a Scholis, definientibus dysenteriam ulcus intestinorum. Quam utut inveteratam, ac paene desperatam sanari vidi saepissime, & quidem cum multa securitate. Exhibendo scilicet remedia quaedam specifica.

At certe cruentum Moloch, Cathedris praesidere conspicuo medicis. Retrospicite ergo confratres. Nam dirus ingruet horror, ad sonum tubae, dum quisque daturus est rationem sua villicationis.

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Finaliter dicam, quid observaverim pleuritisus. Tertio kal. Januarii invasit me repente febris cum rigore leviculo, sic ut dentes quaterent.

[My division of section 34 into paragraphs] (Helmont,<sup>1</sup> p. 397).

In Chandler’s English translation of the *Ortus*<sup>8</sup> the passage is rendered thus:

...it is hurtful in the Bloody Flux. That error floweth from the Schools, who define the bloody flux to be an Ulcer of the Intestines or greater Bowels: The which, how inveterate soever, and almost desperate, I have seen to be very often cured, and indeed with much safty; To wit, by administering some special remedies. But surely I behold a bloody Moloch to sit president in the Chairs of Medicine. Look behind ye or recollect your selves therefore, my fellow Brethren; For a cruel horror will invade the world, at the sound of the Trump, when every one is to give an account of his Stewardship. (Helmont, *Oriatrike* 1662, p. 399)

So, as we see, Helmont was not decrying venesection specifically in ‘pleurisy’ in this passage, but was particularly prohibiting it in ‘the bloody flux’. However, no doubt his Moloch analogy was intended more generally. At section 35 he returns to considering ‘pleurisy’ and continues with an account of his personal experience of the condition:

Finally I shall recount what I observed when I had pleurisy. On 30 December (Tertio kal. Januarii) an insidious fever attacked me, with mild rigors, enough to make my teeth chatter. [my translation].

The illness developed with fever, pain in the chest on inspiration, and bloody sputum. Helmont treated himself ‘immediately with a piece of the genitals taken from a deer, this being to hand, and the pain at once diminished; then I

drank a drachm of goat's blood'. As a result of – or in spite of – these remedies he gradually recovered, without developing the splenic abscess he feared. Needless to say he was not bled (*Ortus* 1648, p. 397; *Pleura furens* sections 35–36).

### Moloch in *Februm doctrina inaudita*

Chapter 7 (p. 35) of the above deals with Helmont's manifold criticisms of the armamentarium of treatments used by physicians – that is, of course, by his enemies the Galenists. He repeats his view that removing blood from the periphery is of no use in treating deep-seated disease, then goes on to make a similar point about the ineffectiveness of paracentesis in dropsy. Helmont says:

Itemque paracentesis, sive apertio prope umbilicum in hydrope, hujusmodi spem extinguere dudum debuisse. Nam ibi obvium est, e propinquo centro, aquas depromere quotidie, de fructu parte aquae pro lubitu in dies haurire. At frustra, quia nequidquam de radice decedit. Adeoque Paracentesis, vitam ad paucos tantum dies dilatat. Vesicatoria autem summe semper nocua sunt, et a spiritu nequam Moloch excogitate. Nam aqua inde continuo stillans, nil nisi cruor transmutatus est. (*De febris* (in *Ortus* 1648<sup>1</sup>) p. 35, section 3)

Chandler translates this:

And likewise a Paracentesis or opening of the belly nigh the navil, in the dropsie, ought long since to have extinguished the like kind of hope. For there it is plainly an easie thing to draw out waters from the nigh Center, and daily to draw from the fruit a part of the water at pleasure : But in vain, because not any thing of the root departs : And so incision nigh the navil, doth only protract life for a few dayes. But let Vesicatories or embladdering Medicines be alwayes exceeding hurtful, and devised by the wicked spirit Moloch : For the water dropping continually from thence, is nothing but venal blood transchanged. Helmont, *Oriatrike*, 1662 p. 967 'A Treatise of Fevers' Ch. 7

For clarity I have retranslated the Latin:

In the same way, [experience of] paracentesis in dropsy - opening the belly near the navel - ought long ago to have extinguished hope of this kind. For, clearly, it is easy to draw off water from this region, and to draw off some of the water daily as one wishes. But this is vain, because it does not remove any of the root cause. Thus, paracentesis only prolongs life for a few days. In addition, vesicatories [blistering agents] are always very painful and were devised by that wicked spirit, Moloch. For the water that drains continually is nothing but transformed blood.

He then goes on to deny that serous fluid in burns arises from normal blood, that is, he believes 'water' is not normally present in healthy blood; he claims, rather, that blood is 'transformed into water' in burns, in dropsy and in the flux (diarrhoea).

From the analysis of these two uses of *Moloch* I think it is apparent that Helmont does, indeed, intend it in each case as a term of abuse rather specifically related to the unnecessary removal of blood in any condition, and not specifically in the treatment of pleurisy or pneumonia, as Osler's use of the quotation might imply.

### Helmont's reasons for rejecting bloodletting

It is tempting for us modern 'moderns' to praise those of our predecessors who advocated some treatment of which we now approve, for, we believe, good reasons; equally we regard as foresighted those who avoided remedies that we believe to be harmful. Even more admirable appear those who taught that such treatment was harmful and to be eschewed, and campaigned against it. Thus, Helmont would seem wise and far-seeing in his condemnation of bloodletting, a procedure which, in the 21st century, we have good reason to avoid in almost all circumstances.

But we would be very mistaken if we were to conclude that Helmont's condemnation of bloodletting means that he had in some way come to an understanding that treatment by depletion of the volume of circulating blood has very rarely any basis in pathophysiology properly understood (specifically, taking account of the circulation of the blood), nor much basis in empirical observation of its malign effects.

There seems to be no reason to suppose that Helmont accepted Harvey's doctrine of the circulation of the blood (*De motu cordis*, 1628<sup>10</sup>) if, indeed, he even knew of it. Pagel<sup>11</sup> is persuaded that Helmont must have known of Harvey's work because he corresponded with the theologian, philosopher and mathematician Marin Mersenne – who certainly did accept Harvey's views (see Keynes<sup>12</sup>). But it is mere conjecture that Mersenne must have told Helmont of the opinions Harvey published in *De motu cordis* – though, by the 1640s when Helmont seems to have written this treatise, Harvey's *De motu cordis* had been published for more than a decade.

Fourteen letters from Helmont to Mersenne have survived but Mersenne's side of the correspondence apparently has not.<sup>13</sup> From the description of these 14 letters given by Nève de Mévergnies<sup>13</sup> it seems that none discussed the blood in any way – let alone Harvey's discovery of its circulation. Examination of the text of the letters published between 1932 and 1988 by Tannery and Waard,<sup>14</sup> including those that became available after Nève de Mévergnies's work, confirms that the only letters extant are those from Helmont to Mersenne and none concerns the circulation of the blood. So Pagel's conjecture that Helmont must have known from Mersenne of the discovery of the circulation is just that – conjecture. Had he known of Harvey's claims but rejected them, one might have expected Helmont would have said so; he is usually voluble in his attacks on those whom he rejects.

We may reasonably conclude that there seems nothing to indicate that Helmont knew of, let alone approved of, Harvey's claims. But we may agree with Pagel that, if Helmont *did* know

of the discovery of the circulation, he did not incorporate this knowledge into his scheme of things – though whether this rejection, if indeed it occurred, was for the reasons that Pagel suggests is, again, surely just speculation.

However, before concluding that, had Helmont accepted Harvey's doctrine this would necessarily have been incompatible with his making a distinction between actions on 'good' and 'bad' blood, it is worth spending a moment on beliefs in the period between Helmont and us. Acceptance of the existence of the circulation would also appear to us to be incompatible with a belief that bloodletting from veins in different parts of the body could have different therapeutic effects.

Though now one might suppose that the acceptance of the fact of the circulation of all the blood throughout the whole body would necessarily result in the abandonment of any belief that one should bleed from different sites for different diseases, in the 18th century we find that this was not always the case. An 18th century physician, Butler,<sup>15</sup> stoutly maintained both a belief in Harvey's discovery and in the differential efficacy of bleeding from different sites for different afflictions. He based his views on claims – not substantiated by any experiments – of local increases in the velocity of flow of the blood in particular parts of the body produced by bleeding from one site or another. These increases in flow he regarded as beneficial – again purely on the basis of theoretical argument and without any relevant observations.

Robert Whytt, a most rational physician and an avowed experimenter, who emphatically accepted Harvey's work on the circulation, occasionally recommends bleeding from a particular site or vessel and apparently finds no inconsistency in this. For example, in his work on 'Nervous hypochondriac or Hysterical Diseases'<sup>16</sup> he says (p. 503) 'It may be proper to observe, that in all violent headaches, we ought to begin the cure with bleeding, either by applying leeches to the temples, or opening the artery there' Opening the temporal artery for headache was an ancient remedy. And, speaking of headache associated with 'suppression of the menses' (p. 502), he recommends 'bleeding especially at the ancles...' So, though Whytt completely accepts circulation of all the blood through the whole body, he believes that bleeding from one site rather than another may be more effective for a particular malady. Old therapeutic habits die hard. But even Butler does not claim that 'pure' and 'impure' blood can be affected selectively by bloodletting and Whytt does not mention such a distinction.

Helmont rejected bloodletting, I believe, principally as a result of arguments based on his own conceptions of the causes of diseases. He was also influenced by empirical observations which, although they would be much more persuasive for us, were, I think, of secondary importance to him and just served to reinforce his belief in its inefficacy. Of the empirical observations, the best known is the case of Ferdinand, Cardinal of Toledo:

In the year 1641, November 8 the body of Prince Ferdinand, brother to the King of Spain, and Cardinal of Toledo, was dissected, who being molested with a Tertian ague for 89 dayes, dyed at 32. years of age : For his heart, liver, and lungs being lifted up, and so the veins and arteries being dissected, scarce a spoonful of blood flowed into the hollow of his breast: Indeed he shewed a liver plainly bloodless, but a heart flaggy like a purse : For but two dayes before his death, he had eaten more if it had been granted unto him. He was indeed, by the cutting of a vein, purges, and leeches so exhausted, as I have said, yet the Tertian ceased not to observe the order of its intention and remission. What therefore hath so great an evacuation of blood profited? or what hath that cooling plainly done, unless that those evacuators were vain, which could not take away so much as a point of the Fevers. (Included in *Ortus*, 1648 and as the translation above in *Oriatrike*, 1662, *A Treatise of Fevers*, Ch 4, p. 951, sections 16, 17)

The last phrase of the Latin could be more clearly translated as:

...or what was the use of the cooling, [but to show] that those evacuations were useless, since they could not reduce the fever even a little.

Here, Helmont concentrates on the ineffectiveness of the 'cooling', which was attributed by the Galenists to the removal of 'hot' blood, in reducing the patient's fever. A few paragraphs later he points out that the patient could have been more effectively cooled by immersion in cold water or exposure to cold air. Not that Helmont believed that cooling was any more effective than bleeding; his case is that even if bleeding were to be effective in producing 'cooling', it was ineffective in reducing the fever. But here he is being disingenuous or, more probably, is deliberately traducing the Galenists' position. For them, cooling by bloodletting was not 'cooling' as we would understand it – and as Helmont here chooses to understand it – that is, reduction in temperature. The Galenists' position was that phlebotomy removed an excess of 'hot' humour; that is, bloodletting removed from the body a substance that was regarded as being present in excess. It was not the changing of the temperature of the body, even if that might be one of the secondary effects of blood loss, which they believed produced the therapeutic effect.

As to the ineffectiveness of the blood loss per se, his arguments are quite convoluted and seem to depend partly on his view – supported, as he says, by Scripture – that life itself resides in the blood:

Because, according to the Scripture, the Soul or Vital Spirit is in the blood. *De febribus* (Helmont 1648) *A Treatise of Fevers* p. 950, 5 (in *Oriatrike*)

So, logically enough, Helmont concludes that throwing away this life-force is unlikely to aid Nature in combating fever (or any other disease, unless that disease is associated with an excess of blood – a *plethora*).

## Pure and impure blood

Helmont's position on bloodletting (*Ortus*, p. 955) is comprehensible if we recall that he completely rejects the doctrine of the humours; but this rejection is not, I think, really the basis for his vituperative rejection of venesection. That basis seems to have had two sources; a belief that blood is the seat of some vital essence or spirit – which he supports by quotation from holy writ (as we have seen) – and the belief that, far from removing the 'vitiating matter', venesection concentrates it by selectively removing 'pure' blood. This, of course, is consistent both with Helmont's disbelief in the humours and his insistence on the existence of diseases as entities, differing among themselves. But it is absolutely contrary to the Galenic belief that there were no diseases as entities but only diseased patients whose maladies were due to various combinations of the patients' temperaments and the imbalances of their humours, together with assorted other factors including climate, diet and – for many Galenists – astral influences. Thus, patients of similar temperaments, disturbed in similar ways – all other things being equal (which, in practice, they were very rarely considered to be) – would exhibit similar signs and symptoms and thus have similar 'maladies'. For Helmont, however, diseases were truly due to external causes and differed as those external causes differed. So far, apparently, so 'modern'. But Helmont's pathophysiology had as little basis in sound evidence as had that of the Galenists. The 'wroth' of the Archeus was surely as little susceptible of proof – or disproof – as was the imbalance of the humours – were the very existence of either to be accepted.

Helmont's position is not even as simple as this, however, because he subscribes to the presence in disease of both 'pure' and 'impure' blood. He approves of the removal of the 'impurities' from the latter but, he argues, the Galenists' procedures do not remove the impure blood; rather, they *preferentially* drain the 'pure' blood, thus making things even worse because the 'impure' blood remains behind working its evil. And, because of the draining of some of the 'life force', the Archeus is enfeebled and even less able to fight against the seeds of disease that lie at the root of the fever. His arguments for this selective removal of one component of the blood – the 'pure' blood – are no more convincing (for us) than are those of the Galenic 'revulsion' and 'derivation' that he decries. In 'revulsion' the patient was bled at a site remote from the seat of disease before the disturbed humours had settled; in 'derivation', once the humours had settled, the patient was bled as close as possible to the affected region to remove the corrupt material that had settled there (for more detail see, for example, Saunders and O'Malley,<sup>17</sup> p. 235).

Helmont's knowledge of, or ignorance of, the circulation of the blood is important because, as we have seen, Helmont supposed that 'good' blood is distinguishable from 'bad' blood and, indeed, that they can be separately affected by bloodletting – a view which we would surely find it was not possible to maintain if one believed in the circulation of *all* the blood through the *whole* body as Harvey's discovery implies.

With the acceptance of the circulation, all Helmont's arguments about selective draining of one rather than another type of blood become meaningless; as meaningless as the Galenic 'revulsion' and 'derivation'.

Helmont summarises his view of the genesis of fever thus:

Therefore a Fever is not a naked Tempest of heat, but an occasional vitiated matter is present; for the expelling whereof, the *Archeus* being as it were wroth, doth by accident inflame himself: The which as long as it shall be neglected in the Schools, the curings of fevers will be rash, destructive, and conjectural, therefore none shall owe anything worthy of giving thanks unto Physitians, seeing they are cured by the voluntary goodness of nature: and I wish they were not put back [i.e. disregarded] by Physitians. (*Oriatrike*, p. 952, 20; *De febribus* 20, 20)

In setting his heretical views against those of the Schools, Helmont was guilty of *impietas* and *hubris* and was reviled for his views. From our standpoint it is laudable that he allowed himself at least to be swayed by empirical observation and experiment. Yet it seems to me that the fundamental basis of Helmont's rejection of bloodletting is that it was as contrary to his (conjectural) system of the genesis of disease as it was consistent with the Galenists' (no less – but also no more – conjectural) system. Since, for Helmont, the Galenists' system was wrong, treatments based upon it must be both mistaken and dangerous.

Although his campaign against bloodletting was based largely upon what appear to us to be mere conjectural explanations of disease, just as much as were the explanations of his opponents, Helmont does differ from them in a striking way. For Helmont sometimes appeals – or at least he says he appeals – to empirical verification of his views in a way that is quite foreign to the teachings of the Schools. And this we may see as consistent with experimentalism in his chemical (and alchemical) studies. The qualification 'says he appeals' is needed because, though we know that he proposed a 'trial' of the efficacy of bloodletting as a treatment for fever, we do not have any evidence that he did, in fact, conduct any experiment or trial of the empirical effect of treating fevered patients with and without phlebotomy. We have become so accustomed to requiring that our beliefs be tested by experiment that we need frequently to remind ourselves that in the mid-17th century the use of directed observation or experimental manipulation was only just beginning to be advocated. It was a minority of scholars and medical practitioners who would consider valuing such observations as highly as the teaching of the Schools and the accumulated wisdom of the ages, as expressed through established authority. Even fewer would accept that 'ocular demonstration' – Harvey's phrase (*De motu cordis*, 1628<sup>10</sup>, p. 5) – was sufficient reason for a mere modern not only to question but to overturn the teaching of his masters. The maintenance of *pietas* and the avoidance of *hubris* were much more powerful forces than we are inclined to remember. Honouring one's teachers and masters was no idle phrase.

For all that Helmont was an experimenter, he was certainly no Harvey; but his effect on the *practice* of medicine in the 17th century – on the practicalities of treatment – was undoubtedly much greater than Harvey's. Aubrey says of the discovery of the circulation:

With much adoe at last, in about 20 or 30 yeares time it was recieved [sic] in all the Universities in the world; and, as Mr Hobbes says in his booke ...he is the only man perhaps that ever lived to see his owne doctrine established in his life-time<sup>18</sup>

'Received in all the Universities' Harvey's doctrine may have been, but a very considerable time was to elapse before knowledge of the circulation of the blood made a jot of difference to the diagnosis of disease or to its treatment. In marked contrast, the 'chemical' remedies of which Helmont came to be regarded as the doyen had an immediate, and long-lasting, effect on medical practice and materia medica. But, whether or not they used Helmont's chemical remedies, most physicians went on bloodletting just as before...

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## Appendix

**Jerome on Moloch in his commentary, written shortly before his death in 420 AD, on the Book of Jeremiah, Chapter 32 verse 35.**

**Figure 2** St Jerome's commentary on the text of Jeremiah Chapter 32<sup>7</sup>

(Vers. 35.) « Et ædificaverunt excelsa (sive aras) Baal : quæ sunt in valle filii Ennom : ut initiarent filios suos, et filias suas idolo Moloch. » Pro *initiarent* in Hebraico scriptum est עביר (עביר), quod Aquila et Symmachus, *transducerent* ; Septuaginta et Theodotio interpretati sunt, *offerrent*. De valle filiorum Ennom, quæ Hebraice dicitur גענום (גינום), supra plenius diximus : quod subjaceat Siloe fontibus, et amœnitate sui, quia locus irriguus est, populum [Al. addit ; Israel] provecaverit ad luxuriam, quam idolorum cultus sequitur. Notandum quoque quod aræ et excelsa, Hebraico sermone appellantur באמות (במות), propter eos qui in Samuelis et Regum volumine quid significet hoc verbum dubitant. Moloch idolum Ammonitarum est, quod in regem vertitur, Significat autem Scriptura divina, quod non solum Baal idolo, sed et Moloch cunctisque dæmonibus in ipso loco populus servierit.

Jeremiah Chapter 32: verse 35 'And they built high places (or altars) to Baal which are in the valley of the son of Ennom: that they might sacrifice [*initiarent*] their sons and their daughters to the idol Moloch.'

For *initiarent* the Hebrew word is EBIR, which Aquila and Symmachus render *transducerent* [might lead]; [but] in the Septuagint and by Theodotius it is translated *offerrent* [they offer]. Of the valley of the sons of Ennom, which is in Hebrew GEENNOM, we have spoken very fully above. Since it lies close to the springs of Siloam, for it is well-watered, its pleasantness encouraged the people to extravagance which was followed by the worship of idols. It is to be noted, for the sake of those who are doubtful of what the word means in the books of Samuel and Kings, that *aræ et excelsa* [altars and high places] are called in the Hebrew tongue BAMOTH. Moloch, which is translated 'king' is an idol of the Ammonites. Divine Scripture also points out that the people served not only Baal but all the demons of Moloch in that place [the valley of the sons of Ennom]...  
*Translation IMLD.*

In Jerome's commentary on just how the Hebrew word he transliterates as EBIR had been translated by earlier scholars we see the roots of a possible controversy about just what happened to the sons and daughters who were taken to Moloch. This controversy actually arose later as we shall see. Returning to Jerome's commentary, *initiarent* might mean they were sacrificed, but it might also mean that they were admitted to some cult without losing their lives. From other parts of his commentary I think one can be tolerably certain that Jerome used *initiarent* to mean sacrificed. *Transducerent*, however, suggests more a procession than a sacrifice while *offerent* returns to the possibility of sacrifice. Elsewhere in Jeremiah (Ch. 7, V. 31), and in other books of the Old Testament, it is made clear that the children were

burnt in the sacrifices in the valley of Hinnom and, no doubt, this was the reason for the interpolation of 'through the fire' in the Authorized (King James, 1611) version of Jeremiah 32:35 : '... to cause their sons and their daughters to pass through the *fire* unto Molech;'. Luther's translation (1534) makes the same interpolation of burning '...daß sie ihre Söhne und Töchter dem Moloch verbrennten'. Arguments suggesting that the ritual might not, or not always, involve the death of the children seem to be more modern – though Calvin, apparently without any biblical evidence or any other authority whatsoever, did suggest that some parents did not have their children sacrificed but pursued some gentler path. For discussion of opinions on whether the worship of Moloch/Molech/Molek might have involved rituals not amounting to actual child sacrifice see the work of Day and Heider<sup>5,7</sup> and the sources therein. Overall, most current opinion seems to conclude that actual sacrifices of children did occur in the valley of the Son(s) of Hinnom. For our purposes, I believe we can be assured that the pious of the 17th century, such as Belmont, would have had no doubt about the reality of the sacrifices or the bloody significance of the idol Moloch.

**Figure 3** A description of the Valley of Gehinnon as seen by an English traveller in the first quarter of the 17th century

186 *Mount Sion. The valley of Gehinnon.* LIB.3.

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Church, vpon a large altar lieth a stone, that (as they say) which was rolled against the mouth of the Sepulcher. From hence we descended into the valley of *Gehinnon*, which diuideth mount *Sion* from the mountaine of *Offence*; so called for that *Salomon* by the persuasion of his wives there sacrificed to *Chamoth* and *Molech*; but now by these Christians called the mountaine of *Illeconsell*; where they say the Pharisees tooke counsell against Iesus: whose height yet shewes the reliques of no meane buildings. This valley is but litle high, now ferting for litle vse; heretofore most delightfull, planted with groues, and watered with fountaines: wherein the *Hebreys* sacrificed their children to *Molech*: an Idoll of brass, hauing the head of a Calfe, the rest of a kingly figure, with armes extended to receive the miserable sacrifice, seared to death with his burning embracements. For the Idoll was hollow within, and filled with fire. And left their lamentable shrieks should fad the hearts of their parents, the Priests of *Molech* did deafe their eares with the continuall clangs of trumpets and timbrels; whereupon it was called the valley of *Topbet*. But the good *Isias* brake the Idoll in peeces, hewed downe the groues, and ordained that that place (before a *Paradise*) should be for euer a receptacle for dead carcasses and the filth of the Citie. *Gehenna*, for the impiety committed therein, is vsed for hell by our Sauiour. On the South side of this valley, neare where it meeteth

This is the description of the Valley of Gehinnon and the worship of Molech by George Sandys.<sup>20</sup> Note that Sandys' description of the Moloch sacrifice accords exactly with the early 18th century image (Figure 1) of how Moloch was imagined.

Sandys' description is so similar to the later lines of *Paradise Lost* that it may well have been the inspiration for the properties Milton ascribes to Molech/Moloch. It also describes the placing of the child sacrifice in the heated arms of the idol as shown in the 18th century depiction of the form of the idol (Figure 1).

But here we must beware. The descriptions of this method of sacrifice to Moloch – bizarre as well as horrific – in which the child was destroyed by the heated metal idol itself, derive from mediæval Rabbinic commentary on the Torah (Midrash).



It seems there is no evidence at all that they represent any Israelite ritual. The commentators of the Midrash appear to have acquired them from classical sources describing sacrifices by the Carthaginians, whose religious practices did, as the mediæval commentators knew, derive from the Phoenician branch of the ancient Canaanite religion. For details see Moore<sup>21</sup> in which he writes:

There is nothing in the Old Testament to suggest this gruesome description of the idol of Moloch and the peculiar way in which children were offered to him; nor do we find any traces of either in the Talmud.

.....

The Old Testament represents the offering of children by fire to Moloch as one of the enormities of the Canaanites;

what more natural than that, when Jewish scholars came upon accounts of the sacrifices of the (Canaanite) Carthaginians such as we have read, they should take them for authentic descriptions of the Moloch worship at Jerusalem?

However, clearly, the descriptions of the Moloch sacrifice in mediæval commentary still influenced European views and imagination in the 17th and 18th centuries.