

# “It All Depends on the Dose”

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## Poisons and Medicines in European History

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## Chapter 5

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### Alchemy, potency, imagination

Paracelsus's theories of poison

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## 5 Alchemy, potency, imagination

### Paracelsus's theories of poison

*Georgiana D. Hedesan*

'All things are poison, and nothing is without poison', declared the maverick Swiss physician Theophrastus Bombastus von Hohenheim, called Paracelsus (1493–1541) in a late defence of his works.<sup>1</sup> This affirmation sounds harshly dualistic and, like much of Paracelsus's rhetoric, is intended to shock its reader. Nevertheless, it also contains in a nutshell the core theory of poison that he expressed at least ten years before and remained essential to his philosophy.

Paracelsus has long been recognised as one of the chief exponents of the medical Renaissance of the sixteenth century. He was much more radical than other reforming physicians: while most contemporary efforts were directed at humanist reappraisals of ancient medicine, he rejected authority in favour of personal experience and practice.<sup>2</sup> He was scathing of the Galenic medical system of his era, and particularly of the theory of four humours on which it was based. Instead, he proposed a new medical framework based on four pillars of knowledge (philosophy, astronomy, alchemy and virtue); amongst other things, his approach led to the gradual acceptance of chemical medicine in the medical pharmacopoeia. His emphasis on treating the causes of disease rather than its symptoms also led to major change in medicine. Certainly, many of his ideas were not new, but the emphasis he put on them and the influence he had on the next generations of medical practitioners made him a central figure of medical reform.

Despite the recognition of Paracelsus's medical innovations, classical historians of science have hesitated to approach his ideas in detail. There are three main types of difficulties in reading Paracelsus: the first is his style that alternates clear pronouncements with obscure references, the second is the apparent inconsistency of ideas across treatises and the third is the framework, which is often radically different from that of modern medicine. Thankfully, due to the extraordinary research of dedicated scholars like Karl Sudhoff, Kurt Goldammer and the late Joachim Telle, we now understand that many of Paracelsus's inconsistencies can be explained by intellectual development or misattribution. At the same time, and with all the effort made by scholars like Walter Pagel or Charles Webster, we are still a long way from grasping Paracelsus's system of thought.

A case in point is Paracelsus's view of poisons, which have a richness that has not been captured in previous scholarship. Most scholars only touched on the subject of poison and did not fully reflect on the complexity of its meaning. Consequently, I have decided to explore Paracelsus's ideas and bring together the various connotations he conferred to the term 'poison'. For the purpose of this chapter, I have chosen a methodology that would take account of the timing of Paracelsus's writings as well as their relevance to the subject at hand. I have consequently decided to take a treatise-based approach that would not only focus on works that have a particular emphasis on the topic of poison, but also reflect, to the best extent possible, the chronology of these treatises. The chapter is thus focussed on seven writings, although it makes references to other works where appropriate. At the end, I have tried to synthesise the views of these works and consider the question of consistency of ideas on 'poison' throughout Paracelsus's writings.

### Two fundamental theories of poison in *Super Entia Quinque* (1520s)

Paracelsus's treatise *Super Entia Quinque* (*On the Five Entities*) is included in a fragmentary work called *Volumen Primum Medicinae Paramirum Theophrasti de Medica Industria*. *Super Entia Quinque* has been considered as one of Paracelsus's earliest writings by Karl Sudhoff, who dated it from the (early) 1520s and described it as incomplete (*Bruchstücke des Buches von den fünf Entien*).<sup>3</sup> This view has not been contested, but the question remains as to why this treatise was included in the *Volumen Paramirum*, whose title connects it to Paracelsus's mature Paramiran writings (1531).<sup>4</sup> Moreover, its reference to the famous treatise *Archidoxis* (c. 1525–6) suggests it may not have been such an early work after all.<sup>5</sup>

In this treatise, Paracelsus attributes disease to five entities: the entity of stars (*ens astrale*), of poison (*ens veneni*), of nature (*ens naturale*), of spirit (*ens spirituale*) and of God (*ens Dei*). Andrew Weeks has argued that these five types are inspired by theories of plague causation found in medieval treatises.<sup>6</sup> The entity, *ens*, is described as 'a cause or a thing which has the ability to govern the body',<sup>7</sup> meaning that it is a force that rules matter. For the purpose of this analysis, I will focus on the first and second entities, the *ens astrale* and the *ens veneni*, which put forth two important theories of poison.

#### *Poison as vapour: the theory of ens astrale*

In the first chapter on the *ens astrale*, the term 'poison' (*Gifft*) represents a power causing disease. Thus, Paracelsus states that 'poison is the origin of every disease, and all diseases are brought on by poison, be they of the body or a wound, nothing excluded'.<sup>8</sup> He argues that poisons originate from five metals and minerals: arsenic, salts, mercury, realgar and sulphur.<sup>9</sup> There is

no one-to-one correspondence between a type of poison and a disease; a poison can, in fact, result in many separate diseases. Consequently, Paracelsus argues that it is more important for a physician to uncover the cause out of which a disease springs, rather than the reasons of its development. We can detect here a clear bias for identifying the fundamental ‘causes’ rather than the ‘effects’ of a phenomenon, because it is more efficient to tackle the former rather than the latter.<sup>10</sup>

Paracelsus explains how people become afflicted by disease originating from the *ens astrale*. First, he postulates that all life in things is sustained by a medium he mysteriously calls ‘M.’ or ‘M. magnum’. This ‘M.’ is a vital substratum that permeates all things and supports all creatures both in heaven and on earth.<sup>11</sup> When M. becomes poisoned, it in turn affects the life of the beings it sustains.

The medium of M. also transmits and captures the influences of the stars to earth. Stars, we are told, are ‘just like people on earth’; they have personalities, and when they are badly disposed, ‘their wickedness comes to the fore’.<sup>12</sup> Negative influences are materialised in the form of poisonous invisible vapours or odours. These vapours of poison pollute the air, and more importantly the life-medium ‘M’, which weakens and thus allows living things to become diseased.<sup>13</sup> Astral poisons affect an entire ecosystem: they corrupt water, earth and air in specific areas, poisoning all its living inhabitants, from fish to human beings and fruit.<sup>14</sup> In the human body, astral poison manifests itself in various ways. It can affect the skin, the internal organs, the blood or the entire body. The type of disease and location within the body depends on the underlying chemical that causes it: mercury, for instance, affects the head, but realgar only the blood.<sup>15</sup>

Not everyone who is exposed to the poisonous vapours becomes ill. Paracelsus argues that only those antagonistic or incompatible with it are infected. Persons whose nature is ‘compatible’ to the vapours and those who can overcome poison by medical preparation or by ‘the refined nature of blood’ remain healthy.

This theory of the *ens astrale* is essential to the understanding of Paracelsus’s view of poison as a type of invisible vapour or air that insinuates itself in the human body and causes disease. This view seems to draw on the Galenic theory of the plague as a poisonous vapour.<sup>16</sup> Here, the vapours originate from the stars, but in other works, Paracelsus extends the ability to emanate vapours to earthly bodies as well.

### *The poison in all things: the theory of ens veneni*

In the chapter on *ens astrale*, Paracelsus taught that all diseases are caused by poison and that some diseases originate from the ill-disposition of the stars. In the next chapter, he went further to explain that disease was also caused by *ens veneni*, the entity of poison. Paracelsus ties *ens veneni* with a theory of universal poison; according to him, everything that we ingest

contains some poison in it.<sup>17</sup> This may seem like a straightforward dualistic view of the universe, but Paracelsus immediately complicates it. Beings are not poisonous in themselves; in fact, God created all things perfect and good.<sup>18</sup> However, in respect to others, creatures are poisonous: none can be ingested as such. As Paracelsus points out in respect to the ox, '[h]ad he been created merely on man's account and not also for his own sake, he would need neither horns, bones, nor hoofs. For these do not constitute food'.<sup>19</sup> The existence of indigestible parts is the proof that God made beings for their own sake, not for consumption by others.

Paracelsus hence distinguishes between beings-in-themselves and beings in relationship with others. To clarify his point, he does not engage in a complex philosophical discussion; rather, he, in a typical move, offers two illustrative examples. The first example is very simple. Grass is not poisonous in itself, but it contains poison when ingested by cattle. The second example is much more elaborate and is based on a political analogy. A ruling Prince and his servants are 'perfect' in themselves. Yet they are not so in relationship with the other. The Prince needs his servants to rule, while the servants need to be compensated for their work on behalf of the Prince. This symbiotic relationship means that the Prince and the servants are both imperfect in their dependency towards each other. Seen from the Prince's point of view, a servant is both a gain and a loss.<sup>20</sup>

These two analogies are important in understanding Paracelsus's thinking. In the first, the example refers to straightforward ingestion. The Swiss physician claims that the act of consumption is incomplete, as beings can never completely digest food. The second example does not refer to digestion in itself; nevertheless, one can easily recognise the expansion of the act of consumption to a universal process. Digestion, it suggests, is an act of hierarchy: the superior creature consumes the inferior one. In the first example, grass is hierarchically subordinate to cattle. In the second, the Prince is superior to the servant.

We can recognise in this hierarchical view of nature both Aristotelian and Christian views; indeed, Paracelsus's discussion seems to draw on the Scholastic distinction between *ens* (being) and *esse* (existence), famously developed by Thomas Aquinas.<sup>21</sup> The Swiss physician accepts the basic idea that human beings stand at the top of both the ladder of being and of the food chain. On the downside, this means that they are also the most likely to be poisoned of all creatures.

Thankfully, this bleak view of a world in which poison is universal is balanced by the idea that God has gifted a way of eliminating poison from food. The method by which this is done is 'alchemy' (*Alchimey*). To understand this, we must first quickly examine what Paracelsus meant by 'alchemy'. He explains it in the following way: '[i]t divides the evil from the good, changes the good into a tincture, conditions the body so it will live, attunes the subject to nature, conditions nature so she becomes flesh and blood'.<sup>22</sup> This definition implies that alchemy is not simply an art invented by man but a

natural process that takes place on a universal scale, which alchemists copy in the laboratory. Indeed, Paracelsus posits that an 'alchemist of nature' resides in all beings and is in charge with the separation of the good and evil in food. Paracelsus defines the good as 'essence' (*Essentia*)<sup>23</sup> and evil as 'poison' (*Venenum*). The *Essentia* sustains, while *Venenum* causes disease.<sup>24</sup>

Paracelsus further posits that the inner 'alchemist', like the exterior one, is an artisan (*Künstler*) that possesses knowledge (*Erkanttuss*) given by God.<sup>25</sup> It contains 'virtue, strength and art'<sup>26</sup> whereby the nourishment is taken into the body, while the residue is expelled. The degree of the inner alchemist's ability differs across the natural world. For instance, Paracelsus posits that the peacock's inner alchemist is superior to that of any other animal as it can consume poisonous snakes and lizards, while the pig's is better than that of man since it can digest excrements.

According to Paracelsus's view, the inner alchemist works continuously at separating the useful from the harmful. Unsurprisingly, the alchemist is found in the stomach, and his separation is a form of digestion whereby food is synthesised in products necessary for the body. Yet the process of digestion is not complete: some impurity always remains, which must be expelled via an assigned emunctory channel. For instance, mucus is described as the poison that the brain has eliminated.<sup>27</sup> This process is not always successful; when proper digestion fails, undigested matter accumulates in the organs and putrefies. This putrefaction leads to corruption, which gives rise to disease. Hence, disease fundamentally arises from the inner alchemist's failure to properly incorporate nourishment and expel what is harmful.<sup>28</sup>

Putrefaction can occur in two locations: in the organs the *Essentia* is destined for (but for failure of alchemy some *Venenum* passes through), or in the organs assigned for elimination of waste. The skin eliminates the 'mercury' of the *Venenum*; the nose, eyes and anus the 'sulphur'; the ears the 'arsenic'; and the urinary tract the 'salt'.<sup>29</sup> The implication is that when an organ fails or malfunctions due to the accumulation of *Venenum*, a disease of these four kinds arises in the body.

To conclude the analysis of *Super Entia Quinque*, we should observe that Paracelsus uses the term 'poison' in two fundamental ways. First, in the chapter on *ens astrale*, he describes poison as a spiritual vapour, which can be transmitted to the stars and then infect the earth and cause disease. Second, in the chapter on *ens veneni*, poison denotes a destructive essence in all types of food, which must be eliminated by the inner 'alchemist of nature' in the act of digestion. These two views of poison remained consistent in Paracelsus's later works, which expand their meaning without fundamentally denying their validity.

### Theory of tartar in *Opus Paramirum* (1531)

The *Opus Paramirum* (1531) has been praised as one of the most influential mature treatises of Paracelsus, not least because it outlines very clearly the

theory of the *tria prima*, the three principles.<sup>30</sup> According to this doctrine, the three principles of salt, mercury and sulphur are the basic building blocks of all things; together, they form everything that exists.

*Opus Paramirum* also outlines Paracelsus's theory of a disease called 'tartar', which is later expanded on in several treatises. The concept of 'tartar' disease had a strong afterlife amongst Paracelsian physicians. Its demise was at least partially brought about by the Flemish medical alchemist Van Helmont, who derided the notion of such a disease.<sup>31</sup>

In *Opus Paramirum*, Paracelsus argues that human beings swallow things that are not in conformity with themselves. These form a residue, alternatively called *stercus* or *excrementum*, which lies in opposition with nourishment, *nutrimentum*.<sup>32</sup> The dualism *nutrimentum*–*stercus* parallels that of *Essentia*–*Venenum* in *Super Entia Quinque*, except for the fact here *stercus* and *nutrimentum* represent physical and tangible products.

The *stercora* are described as stony residues or coagulations. According to *Opus Paramirum*, 'that which never coagulates is *nutrimentum*; that which does coagulate is *stercus*'.<sup>33</sup> Accumulated *stercus* in the body yields tartar.<sup>34</sup> Consequently, Paracelsus defines tartar as

merely *excrementum* of the nutrition and of the drink, in and of themselves, which, in the human being, are then coagulated by the immanent *spiritus* ... Thus we eat and drink the *tartarus*... Out of this, many diseases result in many ways.<sup>35</sup>

As scholars have pointed out, the concept of tartar is related to the residue left by wine in casks.<sup>36</sup> Indeed, Paracelsus himself also refers to tartar as the stone of wine (*Weinstein*). At the same time, the word 'tartar' may also recall medieval fears of the non-Christian outsider, who was sometimes blamed for bringing epidemics to Europe.<sup>37</sup>

*Opus Paramirum* divides tartar into four types: *calculus* (stone), *arena* (sand), *bolus* (clay) and *viscus* (lute or glue). Generally, Paracelsus describes the viscose matter that results from digestion as tartar.<sup>38</sup> Consequently, he argues that the gluten or gum of legumes and the clay of meats are the source of disease in the human body. This is presumably so because of their sticky quality that adheres to the walls of organs just like tartar adheres to wine casks.

Tartar can form in any part of the body where digestion occurs. By comparison with *Super Entia Quinque*, Paracelsus now postulates that digestion occurs throughout the digestive tract. Thus, he maintains that the first digestion happens in the mouth, where tartar may form in the throat, on the tongue, or on the gums.<sup>39</sup> Next, tartar can form at the orifice of the stomach, where it manifests itself through heartburn and *paroxysmus calculi*. Finally, tartar can also form in the stomach and the lower organs, such as the intestines, liver, kidneys, bladder and others.<sup>40</sup> The result is symptoms

such as cramps, vomiting and fevers, and diseases like hepatitis, dropsy and kidney stones.

Up to this point, Paracelsus has described tartar as a disease affecting the digestive system. Yet he is tempted to go further. He now affirms that each part of the body has its own 'stomach' that retains what it needs and rejects the rest. Thus, the brain takes nutriment and expels the excrement via the nose; the lungs take in the air and expunge the excrement in the same way.<sup>41</sup> In this sense, tartar can affect all organs and cause a wide range of life-threatening diseases like asthma, phthisis, consumption, mania, madness, cardiac diseases and others.

If we compare *Opus Paramirum* on tartar and *Super Entia Quinque on ens veneni*, it is clear that the two treatises belong to the same conceptual system. In both cases, disease is due to faulty digestion. The view of tartar fits the *Super Entia Quinque*'s theory of the nourishment-poison dualism of an ingested being. Moreover, *Opus Paramirum*'s extension of tartar from the digestive system to the entire body develops *Super Entia Quinque*'s statement that poison is expunged not only from purely digestive organs, but also from others such as the brain. Although *Super Entia Quinque* fails to mention that 'stomachs' exist everywhere in the body, it generally offers a much stronger theoretical view of disease and poison than *Opus Paramirum*. Clearly, the sophisticated view of beings containing both poison and nourishment is at the root of the more modest concept of tartar in *Opus Paramirum*. This implicitly confirms that *Super Entia Quinque* was written earlier than the *Opus*, but it also indicates that they should be read in conjunction.

### Poisoned imagination in Paracelsus's pest treatises

The theory of the *ens astrale* was based on the notion that heaven infected human beings with poison. As we have seen, this action was due to a vague concept of the ill-disposition of the stars.<sup>42</sup> Yet in Paracelsus's first plague treatise (*Zwey Bucher von der Pestilenz* – the Nördlingen tract, dated 1529/1530), a major shift of perspective occurs. According to it, heaven continues to be the direct cause of the plague, but it is not its first fundamental cause; rather, the disease is produced by human beings themselves, who project it unto the heaven as unto a mirror. Heaven then reflects it back to us.<sup>43</sup> *Von der Pestilenz* classifies the plague as a 'supernatural' disease that is caused by human beings.<sup>44</sup>

This is a radical conceptual reversal. Where the power of the *ens astrale* was attributed to heaven in *Super Entia Quinque*, Paracelsus now chiefly blames man himself for this force, at least as far as the plague is concerned.<sup>45</sup> In this sense, heaven acts as a passive *medium* between the generator of the plague and its recipients. A clear association is hence made between the generation of plague and magical action, which traditionally needs a *medium*.<sup>46</sup> The intermediary is the imagination, as Paracelsus himself puts



it. He suggests that the stars are poisoned by our corrupt imagination and then impress this poison on earth: '[s]o it is that magical imagination proceeds from us to [heaven], and from them again back to us'.<sup>47</sup> The idea that the imagination could cause illness or monstrous births was a familiar trope in Renaissance medicine, although physicians disagreed on whether it could work transitively (outside the body) or only within it.<sup>48</sup>

Heavenly infection has two main causes. One is *libido* or concupiscence; the other is witchcraft. These 'irritate' heaven.<sup>49</sup> Paracelsus points out that the ancient prophets understood the process since they warned people that their libidinous actions have angered their 'father', who would send back the plague.<sup>50</sup> By 'father', Paracelsus understands heaven, the macrocosmic counterpart of man.

Further on, *Von der Pestilenz* affirms that the plague is caused by the principle of sulphur.<sup>51</sup> By this, Paracelsus obviously means the fiery component of the *tria prima* out of which all bodies are made.<sup>52</sup> The sulphur that causes the plague lies hidden in three minerals: antimony, arsenic and marcasite. Each of these minerals affects a certain part of the body: thus, antimonial sulphur affects the groin, the arsenical one the chest and the marcasite the ears. Further, Paracelsus maintains that the sulphur is the corporeal counterpart of the astral spirit of Mars. In a rather unclear passage, he compares the process of the creation of pestilence with the engendering of a Basilisk (a mythical creature that had the power to poison at a distance) by the father alone. In a similar way, the planet Mars, infected by human imagination, can engender a pestilential 'Basilisk' and project the plague on earth by its gaze.<sup>53</sup>

The process of plague causation is more alluded to than explained in *Von der Pestilenz*.<sup>54</sup> More enlightening is the fragmentary and repetitive *De Peste Libri Tres*, dating from around 1535.<sup>55</sup> This treatise reaffirms the close kinship between the macrocosmic heaven and the microcosmic man.<sup>56</sup> It postulates the alliance between human beings and heaven in the production of the plague: 'the planet and man are one thing, not two, just as fire and wood are one'.<sup>57</sup> According to *De Peste*, heaven is the father of the human being and will not inflict disease on him unless it is enraged by man's behaviour, particularly envy, avarice, wars, lies and hate.<sup>58</sup> Indeed, Paracelsus clearly states that the birth of poison should be sought within ourselves, rather than in benevolent and pure heaven.<sup>59</sup> This statement confirms the change in Paracelsus's thought on heaven, already implied in *Von der Pestilenz*: while in *Super Entia Quinque*, the heaven contains and expels poison based on its own mysterious whim, here it is clearly described as a munificent being. Does this mean that we should now understand all diseases caused by the *ens astrale*, not just the plague, as actually inflicted by man's imagination? Logic would dictate it so.

Once again, we are told that the infection of heaven is done by the power of the imagination, which is described as an expulsive power.<sup>60</sup> Corrupt imagination ascends to heaven where it breeds the pest. We are once more

referred to the Basilisk as a metaphor for how it is done, but this time the process is much clearer: human beings engender a 'heavenly Basilisk' (*Basiliscum coeli*) in heaven, which then projects it by means of its light rays unto the earth.<sup>61</sup> These plague rays are deemed extremely powerful; they are compared to swords that cause 'wounds', to sparks out of stone or to thunderclaps.<sup>62</sup>

The mechanism of pestilence is further detailed in *De Pestilitate*, a treatise that was deemed spurious by Sudhoff,<sup>63</sup> but is consistent with *Von der Pestilenz* and *De Peste* on the subject of the plague. It is also much more articulate on the mechanism of poisonous imagination.

Like the previous plague treatises, *De Pestilitate*'s logic is based on the macrocosm-microcosm parallel that is present throughout Paracelsus's work. First, the treatise maintains that in the universe, everything corporeal is generated by a heavenly seed that impregnates the matrix of water. Heaven, however, can also carry the seed of human imagination, which is a spiritual force. It does so because, *De Pestilitate* says, nature 'apes' man. Tradition had man 'aping' nature, but here the influence is the other way around. In fact, heaven copies what human beings do; the macrocosm follows the microcosm.<sup>64</sup> The sky reproduces the seed of human imagination, which it then implants into the waters, giving it life and corporeality.

In line with *De Peste*, *De Pestilitate* sees poison as a type of an 'occult sulphur' lying 'under the skin'.<sup>65</sup> This sulphur can be projected onto the stars. The sulphur in the stars is described as being of three kinds: 'arsenical', 'antimonial' and 'realignic'. These sulphurs are transferred back to earth by means of the celestial rays, which infect the water and the earth, and subsequently human beings.

*De Pestilitate* further asserts that heaven is only one way of transmitting the plague. Contagion is also caused by human eyes.<sup>66</sup> According to the author, the eyes of human beings act like those of the mythical Basilisk, which was reputed to kill with its regard.<sup>67</sup> Here, *De Pestilitate* seems to transcend the context of *Von der Pestilenz* and *De Peste* since it bypasses heaven as a means of causing epidemic. This is complemented by a heightened emphasis on the role of witchcraft in the plague. In this sense, it elaborates on *Von der Pestilenz*'s implied association between the production of the plague and magic. The treatise proceeds to describe the figure of the *venefica*, the witch who poisons by using her evil imagination. This is in turn aroused by Satan.<sup>68</sup> In fact, *De Pestilitate* fully accepts the contemporary belief that witches contribute to the spread of the plague by manipulating putrefied reproductive matter.<sup>69</sup>

Clearly, then, Paracelsus's pest treatises reflect an increased emphasis on human agency in disease. Poison is a chemical substance, but in the case of the plague, it is found in the human body itself. From it, by the mechanism of the imagination, it is projected into the macrocosm. This reflects it as a mirror back unto other human beings, activating and propagating it in the form of epidemic.

***Von der Bersucht* (c. 1533/4, but probably earlier):  
continuity and change**

*Von der Bersucht und anderen Bergkrankheiten* (*On the Miners' Sickness*) is a brilliant example of how Paracelsus applied and expanded on *Super Entia Quinque's* twin theories of *ens veneni* and *ens astrale*. Sudhoff has proposed the tentative date of 1533 or 1534 for the authorship of the work. Nevertheless, there is scope to question this, as *Von der Bersucht* displays the *Super Entia Quinque's* view of heaven rather than that of the pest treatises (of which the first is dated c. 1529/1530). An earlier dating of this work is also supported by the analysis of *Von der Bersucht* by Edwin Rosner.<sup>70</sup>

***Expanding on ens astrale and ens veneni: poisonous vapours in minerals***

According to *Von der Bersucht*, diseases of the element 'air', including the plague, are caused by the power of the stars.<sup>71</sup> The mechanism reflects the theory of the *ens astrale*: stars act by infecting a medium (no longer called 'M.' but 'chaos') with poisonous exhalations. Yet the attention of Paracelsus now shifts from the upper heaven and stars to subterranean earth. The treatise suddenly postulates that the upper heaven has a correspondent, inner heaven, inside the earth. As Paracelsus puts it, 'heaven and earth are two similar heavens, and the minerals and the stars are two similar stars'.<sup>72</sup> Thus within the earth, another 'chaos' can be found with its own 'stars': these are the minerals.

This was not the first time that Paracelsus has made the argument of the existence of other 'heavens' than the upper one. Indeed, in the chapter on *ens naturale* of *Super Entia Quinque*, he maintained that '[s]imilarly as the heavens are in themselves with their entire firmament and constellations, excepting nothing, so is man constellated mightily in and by himself'.<sup>73</sup> Here, the principle is the familiar one of the microcosm-macrocosm correspondence.<sup>74</sup> Yet by positing an upper and lower heaven, Paracelsus seems to draw here on the Hermetic-chemical notion of 'as above so below', as well as the parallel notion of alchemy as lower astronomy present, for instance, in pseudo-Aristotle's *De perfecto magisterio*.

By positing this correspondence, Paracelsus can now extend the theory of the *ens astrale* and its poison to illness caused by metals and minerals in mines. He argues that, just like stars, minerals have their own area of 'influence' and act by emanating spirits.<sup>75</sup> A natural philosopher must know the characteristics of the earthly stars just as the astronomer must know those of the heavenly ones.

The emphasis, as in *ens astrale*, is on vapours and exhalations. However, Paracelsus now has to account for the possibility of ingesting the actual body of a mineral 'star'. He observes that eating a poisonous mineral like arsenic has a quicker impact than breathing in its vapours: 'whatever the body accomplishes in ten hours, the spiritus does in ten years'.<sup>76</sup>

The fact that the body of arsenic is such a strong poison might suggest that it should be cast away altogether as inimical to health. However, Paracelsus perseveres in his belief expressed in *Super Entia Quinque (ens veneni)* that everything has a good and an evil side. In fact, he now extends this view to argue on behalf of a special view of the 'like for like' cure. Thus, gold ore containing arsenic causes disease, but the same gold ore also hides the medicine for that disease, the *Arcanum*.<sup>77</sup> Thus, Paracelsus's 'like for like' principle should better be understood as a principle of complementarity: the same chemical that causes illness also contains the cure for it. The separation of the medicine from the poison is, of course, done by the art of alchemy.

Going further, Paracelsus observes that when a mineral is put in fire, it separates into a 'fixed' and a 'transient' body. The 'transient' body is its poisonous part. According to the *tria prima* theory, Paracelsus divides this transient body into the three principles of salt, mercury and sulphur. The sulphur (the 'fire') and the mercury (the 'smoke') cause diseases, as they mix with air and are breathed into the lungs. The 'adulterated' air dries up the walls of the lungs and then precipitates itself on them, causing various kinds of putrefactions.<sup>78</sup>

By comparison, Paracelsus seems to think that salt, whether in the transient body or as a whole substance, is generally good for health. Yet this affirmation becomes problematic when he names vitriol and alum amongst the salts. According to him, vitriol air 'has the same properties as salt in the brain, lungs and stomach'<sup>79</sup>; that is, it purges the internal organs of diseases. Even more, it contains *Arcana* against serious diseases like jaundice or overflow of the bile. It is surprising that Paracelsus does not address the obvious fact that ingesting vitriol is poisonous; instead, he only perceives the impure ores of salts as being so. Even then, the poison only affects human bodies externally, not internally.<sup>80</sup>

### *Poison as imperfect metals, minerals and gems*

Up to this point, *Von der Bersucht* is based on the *Super Entia Quinque* framework of the *ens astrale* and *ens veneni*. Yet the third book of the treatise adds a new dimension to the discussion of poisons: a theory that originates, like *ens veneni*, from alchemy. Thus, Paracelsus maintains that metals that have not yet reached their 'perfection' contain poison.

The Swiss physician chooses to focus on mercury (quicksilver) as the archetypal poison. He argues that mercury's poisonous quality is due to the fact that it has not reached metallic perfection, that is, 'coagulation'.<sup>81</sup> In line with traditional alchemical theory, all metallic bodies have a preformed fluid state that precedes solidifying into the actual metal. Thus, Paracelsus explains, '[e]very coagulated metal has in it the type of mercurius'. We recognise here the medieval alchemical theory of mercury and sulphur as the origin of all metals. The conclusion is unescapable: 'every metal can arise

from the *argentum vivum* by means of the vulcanic fire, as it is found and seen in its origins'.<sup>82</sup> Clearly, Paracelsus evokes here the theory of metallic transmutation, to which he gives a characteristically medical spin. While they are in their fluid state, metals are inherently poisonous. Once they become coagulated, they lose not only the poison, but also, paradoxically, their 'life': for instance, Paracelsus describes gold as a type of mercury that has been coagulated and is now 'dead'. The only metal that escapes this destiny is quicksilver, which remains fluid, alive and poisonous. The 'reason' for this anomaly seems to be a type of divine predestination since of all metals, it is easiest to prepare medicine out of quicksilver.<sup>83</sup>

Further, Paracelsus expands the theory of poisonous fluidity to stones and gems as well. They too have a liquid state that is dangerous to human health; indeed, he wonders rhetorically, 'if they were not coagulated, who would remain on the earth without an evil? That is, without disease?'<sup>84</sup> Human beings can only survive unharmed because most metals, gems and minerals can be found in a coagulated state.

Since quicksilver is the paradigm of his new theory, Paracelsus proceeds to analyse the poison that exists in this metal, and by extension, in all fluid metallic states. He argues that the essence of mercury is a certain coldness, or 'winter' that is opposed to the warmth of human bodies. Hence, its poison manifests itself by the shivering and chattering of the teeth.<sup>85</sup> The coldness of mercury drives the heat of the human body inward; hence, the heat becomes concentrated in central organs, where it triggers putrefaction. The result is serious disease: ulcers, consumption, paralysis, apoplexy, madness and others, depending on which organ the heat concentrates in. Paracelsus here observes that it 'would therefore be good if the mercurial physicians who prescribe mercurial medicines in the form of salves, fumes, precipitate, corrosive water and the like, would be better instructed concerning the nature of mercurius and would reflect upon it'.<sup>86</sup> The criticism of these physicians is implicit, but Paracelsus avoids polemics here. Instead, he focusses on medicinal recipes for mercurial diseases. The treatise is unfortunately unfinished; some fragments survived but do not add anything important to the discussion.

The theory of the liquid state of metals as being poisonous appears to move beyond the *Super Entia Quinque* framework. Still, it is interesting to note that there is some foreshadowing in the latter treatise. In the chapter on *ens naturale*, Paracelsus states that the humour of the *liquor vitae* in human bodies 'is an *Ens* in its own right and is the power which produces ores in the soil and in the body'.<sup>87</sup> In light of *Von der Bersucht*, this rather obscure statement suggests that Paracelsus already believed in the pre-metallic fluid state, which he associated with a living state, though at this time he did not necessarily deem it poisonous.

The liquid state theory represents a step towards accounting for the fact that the bodies of certain substances like quicksilver or arsenic are fundamentally poisonous. As we recall, in *Super Entia Quinque* and the pest

treatises, Paracelsus defined poison idiosyncratically, as a subtle vapour that harms the human being. Yet he, of course, knew that some substances, like arsenic or mercury, are more harmful to man than others. His *ens veneni* theory does not really account for substantial poison since it considers all things as containing poison to some degree.

Consequently, Paracelsus moves towards a new theory of poison, which fuses the *ens veneni* theory with the concept of poisonous substances. Combining the two ideas results in something that can be called the ‘potent poison’ theory, according to which substances that have stronger poisons than others, like arsenic, also contain more potential for medicine. Indeed, in *Von der Bersucht*, Paracelsus expresses his belief that quicksilver contains within the key of a great art ‘which expels both its own malady and other evils’.<sup>88</sup> Yet this view remains underdeveloped in this work and is better explained in his later treatises, particularly *Sieben Defensiones* (1538).

### Curing with poison in *Sieben Defensiones* (1538)

Let us now review the *Sieben Defensiones* statement, the essay began with ‘All things are poison, and nothing is without poison’. Clearly, this is a reaffirmation of the views expressed in *Super Entia Quinque* (*ens veneni*). That ‘nothing is without poison’ confirms the central theory of the *ens veneni*, according to which alchemy is the key to eliminating the poisonous part of substances. By ‘all things are poison’, Paracelsus also restates his theory of the imperfection of beings in relation with others, although he does so in a much more polemical and stark fashion than in *Super Entia Quinque*.

To this declaration, however, Paracelsus adds the following sentence: ‘the *Dosis* alone makes a thing not poison’. This statement has been celebrated, rightly or wrongly, as the beginning of the modern science of toxicology.<sup>89</sup> Yet the concept of *Dosis* does not come into play in *Super Entia Quinque*, where the poison within all things should be fully eliminated, not dosed.<sup>90</sup>

In this sentence, Paracelsus is clearly no longer referring to the poison within things (the *ens veneni*), but to poisonous substances: ‘I admit that poison is poison’, he says.<sup>91</sup> Yet, as he puts it, ‘every food and every drink, if taken beyond its Dose, is poison’. This affirmation suggests that he is trying to apply the *Super Entia Quinque* principle of ‘all things are poison in relation with others’ to dietary use. He maintains that, in some sense, the consumption of substances that we deem nutritive can become poisonous. We are not told why this happens, but we can speculate it is so because the ‘alchemist of nature’ in the stomach, is not strong enough to separate and eliminate the poison if too much of a substance is ingested. We may recall that, in *Super Entia Quinque*, the failure of the inner alchemist’s digestion is given as a reason for disease; however, here this failure is much more clearly linked with the quantity of the food or medicine being consumed.

Intertwined with this discussion of *Dosis* is the ‘potent poison’ theory, only vaguely expressed in *Von der Bersucht*. In *Sieben Defensiones*,

Paracelsus is obliged to defend his medical use of poisons, so becomes more eloquent about this principle. What ordinary physicians deemed ‘poison’ he sees as potential medicine. Precisely because a dangerous substance is eminently capable of hurting health, it must be wondrously capable of restoring the human body as well: the power resident in the substance can be harnessed to good rather than evil. As Paracelsus puts it,

Behold the toad, how poisonous indeed and detestable a creature it is; behold also the great *Mysterium* which is in it concerning the pestilence... For the *Arcanum* which is in the poison is so blessed, that the poison detracts nothing from it, nor harms it.<sup>92</sup>

The teaching is simple: poison is harnessed into medicine if alchemy is applied to it. The principle is still that of the *ens veneni*, adjusted to account for potent poisons.

Paracelsus further contends that Galenic physicians already know the close relationship between medicine and poison when they prescribe doses to patients.<sup>93</sup> Indeed, the logical implication of dosage is that if the dose is too high, poisoning occurs: this phenomenon Paracelsus interprets as a vindication of his theories of *ens veneni* and of potent poison. Overdosing reveals the poisons that lie hid within apparently inoffensive medicines. Paracelsus also points out that physicians already use small quantities of poison in their recipes. The eminent example is the *theriac*, a medicine that had been praised by Galen himself. An essential component of *theriac* was serpent venom, which acted as antidote to the venom present in the patient’s body.<sup>94</sup>

On the other hand, the Galenic physicians are blamed as being inconsistent with their dosing principle. Paracelsus uses this opportunity to criticise once again the supporters of indiscriminate use of mercury, which ‘know not the correction of mercury, nor its *Dosin*’.<sup>95</sup> As in *Von der Bersucht*, Paracelsus argues against understanding the principle of ‘like cures like’ simplistically, as ‘poison cures poison’. One does not cure mercury poisoning by applying more untreated mercury to it. Poison that is not alchemically treated harms the body.<sup>96</sup>

Moreover, even when properly employed, the Galenic employment of dosage to ‘correct’ poisons is inferior to alchemy, which is solely able to eliminate them. Alchemy allows a physician to use powerful poisons like arsenic and vitriol and turn them into *Arcana* where no poison remains.<sup>97</sup> Arsenic, for instance, when treated with salt nitre loses its poisoning quality. An alchemist can similarly eliminate the poison in vitriol so only its sweetness, *Dulcedine* remains; this is the medical power hidden in the mineral.<sup>98</sup>

## Conclusions

This analysis of several key treatises of Paracelsus (*Super Entia Quinque*, *Opus Paramirum*, the pest treatises, *Von der Bersucht* and *Sieben*

*Defensiones*) sought to show that the Swiss physician created complex and idiosyncratic philosophical theories around the notion of poison. The first, and most enduring theory, is that of the *ens veneni*, the universal poison in all things, first introduced in *Super Entia Quinque*. According to it, all beings are good in their essence but are not perfect in relationship with other beings. More specifically, a being contains both *Essentia* (good and nourishing) and *Venenum* (evil and poisonous). Paracelsus posited the existence of an agent, here called ‘the alchemist of nature’, and later *Archeus*, which separates the *Essentia* from the *Venenum*.

This theory remains a mainstay in the works of Paracelsus. In *Opus Paramirum*, it informs the theory of tartar disease as failed alchemical separation in the stomach. In other works, like *Von der Bersucht*, *Grosse Wundartzney* (1536) and *Sieben Defensiones*, the theory leads Paracelsus to reject a simple ‘poison cures poison’ principle in favour of careful segregation of the medical *Arcanum* from a poisonous substance. The ‘potent poison’ theory, where Paracelsus acknowledges the power resident in specific substances, does not diminish the explanative force of the *ens veneni*. On the contrary, it serves to heighten the importance of alchemy as the supreme key to unlocking powerful remedies.

Another important theory is that of the poison that resides within human beings. This poison is generated by negative emotions and manifested by a corrupt imagination. For Paracelsus, this inner poison hidden in the human spirit bears no redeeming quality. In fact, *De Pestilitate* puts this evil imagination in the context of Adam’s Original Sin, which is described as a type of ‘hereditary poison’ that causes incurable diseases and cannot be eliminated by any physician except by Christ himself. The pest treatises’ view of poison is highly anthropocentric since it shifts attention of medicine from natural factors to man-made ones. The Swiss physician’s insistence on the ability of human beings to poison themselves and their environment would not be ignored by later medical practitioners.

We must acknowledge the fact that Paracelsus’s view of poison fundamentally differs from our own. For Paracelsus, poison is chiefly a spiritual power or an active principle that is harmful towards human health. As he points out in *Sieben Defensiones*, ‘[p]oison is alone what turns out to the harm of man, what is not of service to him but injurious’.<sup>99</sup> True poison is not visible: it is a force visible only by its negative effects. Even when seen in substantial terms, it is perceived as a fluid or volatile being, such as a vapour, an exhalation or a liquid.

The present review of Paracelsus’s poison theories can aid us to refine our view of the Swiss physician’s philosophy. For instance, it furthers the current scholarly view that Paracelsus was keen on basing his natural philosophical system on Christian concerns.<sup>100</sup> Paracelsus’s notion of poison reveals a specifically Christian approach to Renaissance thought. The first characteristic of this was an emphasis on the power of divine agency over the heavenly one; although, for instance, Paracelsus recognised both the



*ens astrale* and the *ens Dei* as causes of disease, the power of the physician could only extend to the former. The second characteristic is the emphasis on human ability to cause widespread disease. This view, strongly affirmed in the pest treatises, describes human beings as eminently capable of infecting others and even the natural environment. The poison in human beings is evidently tied with the notion of the Original Sin. Consequently, the importance of piety, religious faith and the right use of imagination became highly important to Paracelsus's medical views and those of his followers. Finally, the recognition of the existence of poison in all things is combined with an insistence on God having made everything good and perfect in its essence. This should give food for thought to those that present Paracelsus as fundamentally a Gnostic.<sup>101</sup>

Another aspect that arises from the analysis of Paracelsus's poison theories is the depth and importance of alchemy in framing his medical and philosophical views. It is, of course, a well-known fact that Paracelsus was influenced by alchemy, but recent scholarship has highlighted the role played by other disciplines in the formation of his thought, particularly religion and magic.<sup>102</sup> Even Charles Webster, otherwise supporter of the importance of alchemy in Paracelsus's thought, has derived Paracelsus's 'homeopathic' principle ('like cures like') from his mining experience revealed in *Von der Bersucht*, maintaining that 'he was struck by the existence of beneficial and harmful substances in close proximity'.<sup>103</sup> From this, Paracelsus would have extended this insight to chemistry and medicine. In reality, as I have shown, *Von der Bersucht* is posterior and tributary to *Super Entia Quinque*, which expresses Paracelsus's theory of the dual existence of poison in all things in unmistakably alchemical terms. In turn, the homeopathic principle emerges as a system of complementarity between *Venenum* and *Essentia*. Moreover, his adoption of the homeopathic principle was conditioned by his alchemical experience, and as such was far more nuanced than it appears at first glance. As Paracelsus pointed out time and again, one does not simply cure poison with more poison; instead, the poison must first be treated alchemically to yield its medicine.

In the category of myths that should be completely eliminated stands the idea that Paracelsus advocated the indiscriminate use of mercury in medicine. This image of him emerged due to his involvement in the syphilis controversy, supporting mercury over guaiacum as the more effective cure for the disease. Yet in the syphilis treatises, he upheld a very mild use of mercury in comparison with the harsh prescriptions of his day; moreover, he was certainly not the introducer of mercury as treatment for syphilis!<sup>104</sup> Instead, he recognised mercury as a powerful and harmful poison that was responsible for many diseases, and condemned those physicians who did not understand its nature. Paracelsus's advocacy of mercury as medicine was in turn deeply linked with alchemical practice: he viewed mercury as a potentially powerful medicine only after its 'Essence' was separated from its 'Poison' by alchemical means.

The general picture that emerges from the analysis of the poison theories is that Paracelsus's thought was highly complex and informed. Paracelsus is sometimes portrayed as an unlearned empiric, but the analysis does not support this view. *Super Entia Quinque*, which is after all one of the earliest Paracelsian treatises, shows that he treated the subject of poisons from a profoundly philosophical standpoint. He betrays familiarity with Scholastic philosophical distinctions and employs them to preserve the benevolence of God in the face of the empirical evidence of widespread poison. Similarly, in the pest treatises, he clearly reflects on the problems of the *ens astrale*, which not only presents heaven as unjustified originator of disease, but also sets too much weight on the role of stars in illness. His solution is to pass the blame of disease on human beings; in doing so, he manages to preserve the idea that nature is essentially good while accentuating the Christian nature of his philosophy. Such aspects confirm Paracelsus as a reflective, learned and subtle thinker.

## Notes

- 1 Theophrastus von Hohenheim called Paracelsus, 'Seven Defensiones, the Reply to Certain Calumniations of His Enemies', trans. C. Lilian Temkin, in Henry E. Sigerist (ed.), *Four Treatises*, Baltimore: Johns Hopkins University Press, 1941, p. 22.
- 2 There was hardly any medical authority that Paracelsus left uncriticised; see, for instance, his attack on Galen, Avicenna, Pliny and Aristotle in Theophrastus Bombastus von Hohenheim, Paracelsus (1493–1541), 'Paragranum', in Andrew Weeks (ed.), *Essential Theoretical Writings*, Leiden: Brill, 2008, pp. 74–81. See Charles Webster, *Paracelsus: Magic and Mission at the End of Time*, New Haven: Yale University Press, 2008, pp. 113–117. Paracelsus famously burnt Avicenna's books in the public square at Basel, leading to his exile from the city.
- 3 Karl Sudhoff, 'Vorwort', in Theophrast von Hohenheim, gen. Paracelsus, *Sämtliche Werke*, 14 vols, I:1, Munich: R. Oldenbourg, 1929, pp. XXXIX–XLIV.
- 4 Andrew Weeks remarked this incongruity but did not challenge Sudhoff's dating; see *Paracelsus: Speculative Theory and the Crisis of the Early Reformation*, New York: State University of New York Press, 1997, p. 60.
- 5 Philippus Theophrastus Bombast von Hohenheim, Paracelsus genannt, *Der Bücher und Schriften*, ed. Johannes Huser, 9 vols, I, Basel, 1589, pp. 60, 63.
- 6 Weeks, *Paracelsus*, pp. 68–69; Paracelsus does mention the five types of pestilence in his introductory remarks.
- 7 Theophrastus von Hohenheim called Paracelsus, 'Volumen Medicinae Paramirum', trans. Kurt F. Leidecker, in Owsei Temkin (ed.), *Supplements to the Bulletin of the History of Medicine*, Baltimore: John Hopkins University Press, 1949, p. 8, *Der Bücher und Schriften*, I, 8: 'Ens ist ein ursprung oder ein ding / welchs gewalt hatt den leib zu regiren'.
- 8 Paracelsus, 'Volumen Medicinae Paramirum', 21, *Der Bücher und Schriften*, I, p. 20: 'Dann / Gifft ist einer jedlichen krankheit anfang / und durch diese gifft werden alle krankheiten / Leib unnd Wundt / nichts entschlossen'.
- 9 Paracelsus, 'Volumen Medicinae Paramirum', p. 21; *Der Bücher und Schriften*, I, pp. 20–21. Walter Pagel, *Paracelsus: An Introduction to Philosophical*

- Medicine in the Era of the Renaissance*, 2nd edition, Basel: S. Karger, 1982, pp. 174–177, has maintained that Paracelsus's theory of the chemical origin of disease may have been influenced by Marsilio Ficino's work on pestilence.
- 10 Paracelsus, 'Volumen Medicinae Paramirum', p. 21; *Der Bücher und Schriften*, I, p. 21: 'wissen / das ihr vergebens erfarend einer iedlichen krankheit sein sonderen ursprung / dieweil Ein ding sovil krankheiten macht'.
  - 11 Paracelsus, 'Volumen Medicinae Paramirum', pp. 18–19, *Der Bücher und Schriften*, I, p. 18.
  - 12 Paracelsus, 'Volumen Medicinae Paramirum', p. 20; *Der Bücher und Schriften*, I, p. 19: 'Die Astra haben ihr natur / und ihr mancherley eigenschafft: wie dann auff Erden die Menschen'.
  - 13 Paracelsus, 'Volumen Medicinae Paramirum', p. 20; *Der Bücher und Schriften*, I, pp. 19–20.
  - 14 Paracelsus, 'Volumen Medicinae Paramirum', p. 22; *Der Bücher und Schriften*, I, pp. 21–22.
  - 15 Paracelsus, 'Volumen Medicinae Paramirum', p. 23; *Der Bücher und Schriften*, I, p. 22.
  - 16 Pagel, *Paracelsus*, pp. 174–177.
  - 17 Paracelsus, 'Volumen Medicinae Paramirum', p. 24; *Der Bücher und Schriften*, I, p. 24.
  - 18 Paracelsus, 'Volumen Medicinae Paramirum', p. 25; *Der Bücher und Schriften*, I, p. 24.
  - 19 Paracelsus, 'Volumen Medicinae Paramirum', p. 33; *Der Bücher und Schriften*, I, pp. 33–34: 'wer er allein beschaffen von wegen des menschen / und nit sein selbst auch / so bedörfft er der hörner nit / noch der bein / noch der flawen: wann darinn ist kein nahrung'.
  - 20 Paracelsus, 'Volumen Medicinae Paramirum', pp. 25–26; *Der Bücher und Schriften*, I, p. 25.
  - 21 The classical treatment on the subject is by Etienne Gilson, *The Christian Philosophy of St Thomas Aquinas*, New York: Random House, 1956, pp. 29–45.
  - 22 Paracelsus, 'Volumen Medicinae Paramirum', p. 29; *Der Bücher und Schriften*, I, p. 28: 'Er scheidet diese böß vom gutten / Er verwandelt das gutt in ein Tinctur / Er tingirt den leib zu seim leben / Er ordinirt der Natur das subject in ihr / Er tingirt sie / das sie zu Blut und Fleisch wirdt'.
  - 23 Paracelsus, *Der Bücher und Schriften*, I, p. 24, also calls this essence 'the great nature' (*die gross Natur*). This terminology is repeated in *Sieben Defensiones*, where 'nature' is the force opposite to 'poison'.
  - 24 Paracelsus, 'Volumen Medicinae Paramirum', p. 29; *Der Bücher und Schriften*, I, p. 29: 'Essentia ist das / dass den menschen auffenthalt: Venenum das / dass ihm krancckheit zufügt'.
  - 25 Paracelsus, 'Volumen Medicinae Paramirum', p. 29; *Der Bücher und Schriften*, I, p. 25.
  - 26 Paracelsus, *Der Bücher und Schriften*, I, p. 26: 'Tugent, krafft / und kunst'. Leidecker has this as 'quality, ability and dexterity', which is less forceful; 'Volumen Medicinae Paramirum', p. 26.
  - 27 Paracelsus, 'Volumen Medicinae Paramirum', p. 17; *Der Bücher und Schriften*, I, p. 30.
  - 28 Paracelsus, 'Volumen Medicinae Paramirum', p. 16; *Der Bücher und Schriften*, I, p. 29.
  - 29 Paracelsus, 'Volumen Medicinae Paramirum', p. 33; *Der Bücher und Schriften*, I, p. 33.

- 30 This was not the first time the three principles made an appearance in Paracelsus's treatises; as Webster pointed out, they also appear in the *Elf Tractat, Von der natürlichen dingen, Von den ersten dreien principiis, and De mineralibus; Paracelsus: Magic and Mission*, 140–142. Yet it is *Opus Paramirum* that articulates the theory in its full and comprehensive form.
- 31 For a good analysis of the tartar theory, as well as Van Helmont's rejection of it, see Pagel, *Paracelsus*, 153–165.
- 32 Theophrastus Bombastus von Hohenheim, Paracelsus (1493–1541), 'Opus Paramirum', in *Essential Theoretical Writings*, ed. Andrew Weeks, Leiden: Brill, 2008, p. 517.
- 33 Paracelsus, 'Opus Paramirum', p. 517.
- 34 The process of formation of the *stercus* is described analogically as 'wood yields ashes; ash yields salt; salt yields the lapis [stone]; Paracelsus, 'Opus Paramirum', p. 519.
- 35 Paracelsus, 'Opus Paramirum', pp. 519, 521.
- 36 Paracelsus, 'Opus Paramirum', p. 525.
- 37 For instance, the 'Tatars' were blamed for spreading the Black Death; see, for instance, Ole J. Benedictow, *The Black Death, 1346–1353: The Complete History*, Woodbridge: Boydell Press, 2004.
- 38 Paracelsus, 'Opus Paramirum', p. 527.
- 39 Paracelsus, 'Opus Paramirum', p. 533.
- 40 Paracelsus, 'Opus Paramirum', p. 539.
- 41 Paracelsus, 'Opus Paramirum', p. 559.
- 42 This was also upheld in the foundational treatise 'Paragranum', in *Essential Theoretical Writings*, ed. Andrew Weeks, Leiden: Brill, 2008, p. 177: 'It must be understood that the human being does not poison the external [world], but vice-versa'.
- 43 Paracelsus, 'Zwey Bücher von der Pestilenz unnd Ihren Zufellen', in *Der Bücher und Schriften*, III, 134: 'Im Himmel ist nie kein Pestis gewesen: Alle die ubernatürlichen krankheiten entspringen in uns/ und seind ohne würckung eindringend durch den Himmel / in demselben generirt es sich / und falt auss demselbigen wider auff uns'.
- 44 Paracelsus, 'Von der Pestilenz', p. 134.
- 45 This was not a completely original view; as Anna Montgomery Campbell points out, some plague treatises attributed the epidemic to 'accidents of the soul' caused by intemperate emotions; *The Black Plague and Men of Learning*, New York: AMS Press, 1966, p. 77. See also Karl Sudhoff, 'Pestschriften', *Archiv für die Geschichte der Medizin* 7:2 (1913): pp. 96, 98.
- 46 Paracelsus, 'Von der Pestilenz', pp. 134–135. On this subject, see D.P. Walker, *Spiritual and Demonic Magic from Ficino to Campanella*, London: Warburg, 1958, p. 76.
- 47 Paracelsus, 'Von der Pestilenz', p. 135: 'Darum so gehet *Magica Imaginatio* von uns in ihn / von ihm wider auff uns'.
- 48 See, for instance, the excellent discussion of these views in Guido Giglioli, *Immaginazione e Malattia*, Milan: Franco Angeli, 2000, pp. 58–67.
- 49 Paracelsus, 'Von der Pestilenz', pp. 147–148.
- 50 Paracelsus, 'Von der Pestilenz', pp. 135–136.
- 51 Paracelsus, 'Von der Pestilenz', p. 136.
- 52 Paracelsus, 'Von der Pestilenz', p. 136.
- 53 Paracelsus, 'Von der Pestilenz', p. 138.
- 54 I am not focussing on *Von den Pestilenz ein Büchlein: Beschrieben an die Statt Sterzingen* (written around 1534), as this work mainly contains recipes for curing the plague.

- 55 Or could this treatise be simply another version of *Von der Pestilenz*, thus written around the same time?
- 56 Paracelsus, 'De Peste Libri Tres, cum quibusdam ipsius Autoris Additionibus', in *Der Bücher und Schrifften*, III, p. 153.
- 57 Paracelsus, 'De Peste Libri Tres', p. 154: 'Der Planet und der Mensch ist Ein ding / nicht zwey / gleich als Few und Holz ein ding ist'.
- 58 Paracelsus, 'De Peste Libri Tres', p. 156.
- 59 Paracelsus, 'De Peste Libri Tres', p. 162: 'Nuhn der Himmel ob uns / ist nit wider uns / sondern mit uns: Aber so wir den vergifften / so schütt er diese Gifft über uns auß. Der anfang ist in uns / und alle falschen tücken in uns / und Untugend'.
- 60 Paracelsus, 'De Peste Libri Tres', p. 159.
- 61 Paracelsus, 'De Peste Libri Tres', pp. 163–164.
- 62 Paracelsus, 'De Peste Libri Tres', pp. 165, 169, 170.
- 63 Karl Sudhoff, 'Vorwort', XIV, p. XXXIII.
- 64 (Pseudo-)Paracelsus, 'De Pestilitate, Das ist / vom Ursprung unnd Herkommen Pestis', in *Der Bücher und Schrifften*, III, p. 47.
- 65 Pseudo-Paracelsus, 'De Pestilitate', p. 75.
- 66 Similarly, Paracelsus states that stars, particularly the Sun, and the Moon are the eyes of the macrocosm, and they too can infect the world below.
- 67 Pseudo-Paracelsus, 'De Pestilitate', pp. 76, 77.
- 68 Pseudo-Paracelsus, 'De Pestilitate', pp. 91–94.
- 69 Pseudo-Paracelsus, 'De Pestilitate', p. 92:
- Es ist auch zu Sanct Veyt und zu Villach erfahren / das solche Heren haben genommen die Erden unnd Staub vonn den Gräbern der Todten in der zeit der Pestilenz / und die zugericht mit ihrer Zauberkunst / unnd eine hefftige Pestilenz damit angerichtet / dardurch viel 1000. Menschen Inficirt und gestorben seindt.
- 70 Edwin Rosner, 'Hohenheims Bergsuchtmonographie', in Rosemarie Dilg-Frank (ed.), *Kreatur und Kosmos: International Beitrage zur Paracelsusforschung*, Stuttgart: Gustav Fischer Verlag, 1993, pp. 20–52.
- 71 Theophrastus von Hohenheim called Paracelsus, 'On the Miners' Sickness and Other Miners' Diseases', trans. George Rosen, in Henry E. Sigerist (ed.), *Four Treatises*, Baltimore, 1941, pp. 58, 59, *Der Bücher und Schrifften*, V, pp. 3–5.
- 72 Paracelsus, 'On the Miners' Sickness', p. 66, *Der Bücher und Schrifften*, V, p. 12: 'Himmel und Erden seindt zwey gleich Himmel / und die Miner und das Sydus seind zwey gleiche Sydera'.
- 73 Paracelsus, 'Volumen Medicinae Paramirum', p. 35; *Der Bücher und Schrifften*, I, p. 36.
- 74 On this topic, see Pagel, *Paracelsus*, pp. 55–56.
- 75 Paracelsus, 'On the Miners' Sickness', p. 65, *Der Bücher und Schrifften*, V, p. 11.
- 76 Paracelsus, 'On the Miners' Sickness', p. 69, *Der Bücher und Schrifften*, V, p. 15, 'das ist / was das Corpus zuwegen bringt in 10. Stunden / daran macht das Spiritus 10. Jahr'.
- 77 Paracelsus, 'On the Miners' Sickness', p. 72, *Der Bücher und Schrifften*, V, p. 18.
- 78 Paracelsus, 'On the Miners' Sickness', pp. 80–85; *Der Bücher und Schrifften*, V, pp. 26–31. Interestingly, there is no mention of the disease of tartar in this treatise.
- 79 Paracelsus, 'On the Miners' Sickness', p. 93; *Der Bücher und Schrifften*, V, pp. 38–39.
- 80 Paracelsus, 'On the Miners' Sickness', p. 94; *Der Bücher und Schrifften*, V, p. 39.

- 81 Paracelsus, 'On the Miners' Sickness', p. 104; *Der Bücher und Schriften*, V, p. 50.
- 82 Paracelsus, 'On the Miners' Sickness', p. 104; *Der Bücher und Schriften*, V, p. 50.
- 83 Paracelsus, 'On the Miners' Sickness', p. 107; *Der Bücher und Schriften*, V, p. 53.
- 84 Paracelsus, 'On the Miners' Sickness', p. 106; *Der Bücher und Schriften*, V, p. 52.
- 85 Paracelsus, 'On the Miners' Sickness', p. 114; *Der Bücher und Schriften*, V, p. 61.
- 86 Paracelsus, 'On the Miners' Sickness', pp. 117–118; *Der Bücher und Schriften*, V, p. 65.
- 87 Paracelsus, 'Volumen Medicinae Paramirum', pp. 44–45.
- 88 Paracelsus, 'On the Miners' Sickness', p. 105; *Der Bücher und Schriften*, V, p. 51.
- 89 On this subject, see B. Diechmann, D. Henschler, B. Holmsted and G. Keil, 'What Is There That Is Not Poison? A Study of the Third Defense by Paracelsus', *Archives of Toxicology* 58 (1986), pp. 207–2013 (212).
- 90 Webster thinks that dosage was of limited concern to Paracelsus in comparison to chemistry and that 'Paracelsus was only to a limited extent the anticipator of the modern dose-response relationship, or of the homeopathic principle of serial dilution', *Paracelsus: Magic and Mission*, p. 150.
- 91 Paracelsus, 'Seven Defensiones', p. 22.
- 92 Paracelsus, 'Seven Defensiones', p. 21.
- 93 Paracelsus, 'Seven Defensiones', p. 22.
- 94 See Antoine Calvet, 'A la recherche de la médecine universelle. Questions sur l'élixir et la thériaque au 14<sup>e</sup> siècle', in Chiara Crisciani and Agostino Paravici Bagliani (eds.), *Alchemia e medicina nel Medioevo*, Florence: Micrologus Library, 2003, pp. 117–216.
- 95 Paracelsus, 'Seven Defensiones', p. 22.
- 96 Paracelsus, 'Seven Defensiones', p. 22.
- 97 Paracelsus, 'Seven Defensiones', p. 23.
- 98 Paracelsus, 'Seven Defensiones', p. 23.
- 99 Paracelsus, 'Seven Defensiones', p. 24.
- 100 This is obvious in the case of the recent treatments of Paracelsus, including Webster, Weeks and Ole Peter Grell's edited collection *Paracelsus: The Man and His Reputation, His Ideas and Their Transformation*, Leiden: Brill, 1998. This scholarship has sought to correct the views of Pagel and even Allen Debus, who set aside Paracelsus's religious views.
- 101 Walter Pagel was particularly keen on portraying Paracelsus as a Gnostic but based most of his arguments on the probably spurious *Philosophia ad Atheniensis*, 'The Prime Matter of Paracelsus', *Ambix* 9:3 (1961): 117–136. Pagel seems to have taken the original criticism of Thomas Erastus, Paracelsus's arch-enemy, seriously. It is true that Paracelsians found it difficult to explain *ad Atheniensis* in an orthodox fashion; see my article 'The Mystery of *Mysterium Magnum*: Paracelsus's Alchemical Interpretation of Creation in 'Philosophia ad Atheniensis' and Its Early Modern Commentators', in Caroline Vander Stichele and Susanne Scholz (eds.), *Hidden Truths from Eden: Esoteric Interpretations of Genesis 1–3*, Atlanta: Society of Biblical Literature Semeia Studies, 2014, pp. 141–162.
- 102 Recent scholarship includes Karl Möseneder, *Paracelsus und die Bilder: Über Glauben, Magie und Astrologie*, Tübingen: Niemeyer, 2009, the edited collection *Paracelsus im Kontext der Wissenschaften seiner Zeit*, Berlin: Niemeyer, 2010, Jean-Michel Rietsch, *Théorie du langage et exégèse biblique chez Paracelse (1493–1541)*, Bern: Peter Lang, 2002, the books of Webster and Weeks, and articles written by Urs Leo Gantenbein, Hartmut Rudolph, Ute Gause, Heinz Schott and Dane T. Daniel. In these otherwise important works,

alchemy is secondary to other frameworks deemed more important to Paracelsus's thought, or integrated within them.

103 Webster, *Paracelsus: Magic and Mission*, pp. 148–149.

104 The Science Museum website, for instance, erroneously states that 'Paracelsus introduced new chemical substances into medicine, for instance the use of the metal mercury for the treatment of syphilis', [www.sciencemuseum.org.uk/broughttolife/people/paracelsus.aspx](http://www.sciencemuseum.org.uk/broughttolife/people/paracelsus.aspx) [accessed 1 December 2015].