

PARACELSIANISM AND THE THEORETICAL FOUNDATION OF CHEMICAL MEDICINE

An exploration of the role played by alchemy in the advent of chemical medicine in the sixteenth century reveals a link between alchemy and modern science. The most substantive contribution alchemy made to modern science was by way of the medical theory of a Swiss-German alchemist and physician, Paracelsus (1493-1541). The works of Paracelsus give substance to the proposal that alchemy went well beyond gold making and elixirs of life. Drawing upon a scientific spirit and the alchemical tradition of uniting theory and practice, he created a controversial chemical worldview that challenged orthodox Hellenistic ideas of medicine. Through their medical practices and the controversy that ensued, Paracelsus and his followers made lasting contributions to the medical, pharmaceutical and scientific worlds alike.*

The terms “alchemy” and “chemistry” were used interchangeably until the late seventeenth century. In order to highlight this fact and shake the preconception that the two disciplines were considered separate, some historians of science have recently stated preference for the term “chymistry” as an inclusive alternative.¹ As this paper is an exploration of the topic rather than an in-depth study, it will use the more familiar term “alchemy.”

I. A Brief History of Alchemical Tradition: Unifying Theory and Practice

Many people have a basic understanding of alchemy because it has historically enjoyed a place in the popular imagination. Transmutation, the act of turning base metals into gold, is perhaps alchemy’s most famous characteristic—although life-lengthening elixirs have received their share of fame as well. An entire generation of children recently became familiar with alchemical legend in J. K. Rowling’s *Harry Potter and the Philosopher’s Stone*. Unfortunately, while popular culture can lend awareness to a topic, it comes with many popularized

* I would like to acknowledge those who have read my work and provided feedback over the course of many months. This paper owes much to the generous suggestions and advice of Dr. Francesco Luzzini (University of Milan) and the guidance of Dr. Joanna Carraway Vitiello (Rockhurst University).

¹ See William Newman and Lawrence Principe, "Alchemy vs. Chemistry: The Etymological Origins Of A Historiographic Mistake," *Early Science and Medicine* 3 (1998): 32-65. *JSTOR*; Marcos Martínó-Torres, "Some Recent Developments in the Historiography of Alchemy," *Ambix* 58 (November 2011): 215-237.

misconceptions as well. As a result, it must be pointed out that alchemy was not simply a matter of combining pre-modern scientific ignorance with greed for wealth and desire for immortality. In fact, alchemical practices were supported by accepted philosophical theories at various points in history.

Transmutation in particular enjoyed a great deal of theoretical support. Lawrence Principe, a well-known expert on the history of alchemy, writes, “Many theoretical frameworks for alchemy would develop in various times and places, and these frameworks both supported the possibility of transmutation and suggested avenues for pursuing it practically.”² The union of Greek philosophy with long-established Egyptian chemical techniques, in fact, sparked the very genesis of alchemy.³ While crafts such as metallurgy, glassmaking, and embalming had been performed for years with only practical (rather than theoretical) knowledge necessary, the Greeks sought philosophical explanations as to why these chemical processes worked the way they did.⁴ The interaction between the theoretical and the practical began to shape the history of alchemy, which, as Principe says, is “. . . an endeavor of both head and hand.”⁵ By the fifteenth and sixteenth centuries, Paracelsus and the interface between the theory and practice would lead alchemy into the world of medicine.

The theoretical history of alchemy can be traced back to Empedocles, the philosopher who postulated that all matter was made up of four elements: air, earth, fire, and water. All substances on earth, he said, were mixtures of these four elements in varying proportions. Aristotle, having absorbed this theory into his own worldview, later attributed four qualities to the four elements: hot, cold, wet, and dry. Significantly, this model implied that one type of matter could be transmuted into another if the correct changes were made to the matter’s qualities.⁶ Therefore, it was early on that one of the primary goals of alchemy was the transmutation of metals. Around A.D. 300, the work of Zosimos of Panopolis illustrates how the fusion of theory and practice established an orderly method for pursuing transmutation. In the fragments of his texts there can be identified “. . . *theoretical principles* that guided his practical work, as well as *practical observations* that supported or modified his theories.”⁷ According to Zosimos, metal substances had two components, which he called their “bodies”

² Lawrence Principe, *Secrets of Alchemy* (Chicago: University of Chicago Press), 16.

³ Richard Morris, *The Last Sorcerers: The Path from Alchemy to the Periodic Table* (Washington D.C.: Joseph Henry Press), 4.

⁴ Trevor Levere, *Transforming Matter: A History of Chemistry from Alchemy to the Buckyball* (Baltimore: John Hopkins University Press), 4.

⁵ Principe, *Secrets of Alchemy*, 207.

⁶ Levere, *Transforming Matter*, 4-5.

⁷ Principe, *Secrets of Alchemy*, 16.

and “spirits.” The spirits, which carried the identifying properties of the metal, could be changed. The bodies, which were understood to be consistent across all metals, could not. Furthermore, the spirits could actually be separated from the bodies using methods such as distillation and sublimation.⁸ With this model in mind, it is easy to see how, theoretically at least, new metals could be formed using the “spirits” of other metals.

Following the birth of Islam, alchemy underwent an important stage of development. In A.D. 640 the Islamic Empire conquered the Egyptian city of Alexandria, and as a result Muslims encountered Greek culture. The alchemical works of Hellenistic Greeks were translated into Arabic, and soon thereafter, significant advances were being made in the field. Many alchemical manuscripts available from this time are attributed to the mysterious “Jabir.” Historians of science doubt whether “Jabir” was an actual person—it seems more likely that his name was simply a pseudonym representing many different authors. Nevertheless, the works of Jabir are valuable to historians of science who wish to gain an understanding of the theories and practices of alchemy during the Islamic period.⁹ Specifically, Jabir introduces the theory that “. . . metals were mixtures of sulfur, mercury, and arsenic, except for gold, which was made up of sulfur and mercury alone.”¹⁰ Jabir’s sulfur and mercury, however, were “different from and purer” than what naturally occur; “. . . by purifying everyday mercury and sulfur and appropriately adjusting their proportions, the alchemist could make gold.”¹¹ (This theory was to become a great influence for later European alchemists.) It is also in the Islamic period that the idea of the Philosopher’s Stone makes its first appearance. It was believed by many alchemists that from the legendary Philosopher’s Stone, an elixir could be made that would extend the length of life. Consuming the elixir continuously would render the drinker, for all practical purposes, immortal. Thus, in Islamic alchemy, the extension of life became an important goal in addition to the creation of gold. It would remain so for the rest of alchemy’s history.

The next great change for alchemy came when, in the twelfth century A.D., Christian monks began translating Arabic alchemy texts into Latin, making Western Europe the third culture in which alchemy would prosper. Tellingly, the first alchemical text to be translated was *On the Composition of Alchemy*, which famously contained instructions for creating the Philosopher’s Stone.¹² For many European alchemists, the search for the Philosopher’s Stone would become a

⁸ Ibid.

⁹ Principe, *Secrets of Alchemy*, 33.

¹⁰ Morris, *The Last Sorcerers*, 7.

¹¹ Levere, *Transforming Matter*, 7.

¹² Principe, *Secrets of Alchemy*, 51-52.

lifelong ambition.¹³ In this period, some truly revolutionary contributions to alchemical knowledge were made by an Italian Franciscan alchemist who wrote under the name of Geber in the thirteenth century. The pseudonym was a nod to his Arabic predecessor Jabir; Geber probably sought to capitalize on Jabir's reputation as a celebrated alchemist by association. Geber expanded upon many ideas of Arabic alchemy, inventing a type of corpuscularianism “. . . such that inner and outer qualities could be reinterpreted in terms of inner and outer layers of minute particles.”¹⁴ These particles, called corpuscles, are strikingly similar to the concept of atoms in modern science, except Geber's corpuscles could be divided. He even explained chemical processes such as sublimation (the purification of a substance by heating it to a vapor state, which forms a solid deposit upon condensation) by insisting that the “parts” (or corpuscles) of some substances are less densely held together than others.¹⁵ Another intriguing aspect of Geber's writings is that he indicates “. . . alchemical success was God-given, an attitude that reinforced the spiritual aspects of medieval alchemy.”¹⁶ In Medieval Europe, many features of alchemy took on a spiritual meaning. Finding the Philosopher's Stone became a symbol for saving one's soul, and transmutation of a common metal into the ever more desirable gold became associated with the Christian concept of resurrection.¹⁷

II. Paracelsus and Paracelsianism

In the sixteenth century, a Swiss-German physician altered the world of alchemy forever by tying it to medicine. His name was Philipus Aureolus Theophrastus Bombastus von Hohenheim, known to most of history as Paracelsus, considered the founder of *iatrochemistry*, or chemical medicine. Historical sources as well as Paracelsus's own writings paint a picture of a revolutionary and iconoclastic figure who rejected canonical medical knowledge. As early as fourteen, Paracelsus became a wandering scholar and physician, traveling from town to town in search of teachers and, later, patients to heal. He objected to the pursuit of transmuting base metals into gold, believing to be a waste of time.¹⁸ He believed alchemy should be put to chiefly medical use,

¹³ Morris, *The Last Sorcerers*, 10-24.

¹⁴ Levere, *Transforming Matter*, 7.

¹⁵ Principe, *Secrets of Alchemy*, 57-58.

¹⁶ Levere, *Transforming Matter*, 8.

¹⁷ Ibid.

¹⁸ Lest modern readers put Paracelsus on too high a pedestal, however, it should be noted that he was not the first to object to transmutation. Trevor Levere, history of science professor at the University of Toronto, notes that even during the Arabic period of

considering it to be one of the four pillars of medicine, along with philosophy, astronomy, and virtue of the physician. He wrote in one treatise, “The third fundamental part, or pillar, of true medicine, is Alchemy. Unless the physician be perfectly acquainted with, and experienced in, this art, everything that he devotes to the rest of his art will be vain and useless.”¹⁹ With this outlook, Paracelsus and his followers (the various schools of thought inspired by Paracelsus came to be known as “Paracelsianisms”) attempted to take medicine in a decidedly alchemical direction. Paracelsianism’s effect on medicine was shaped, as the effects of alchemy often were, by the interaction of theory and practice. The theoretical component of this interaction, Paracelsus’s medical worldview, is commonly referred to as the Chemical Philosophy.

Like many Renaissance natural philosophers influenced by Hermeticism, Paracelsians believed in the “two-book” conception of nature. This is the idea that God wrote two books, one literal and one metaphorical, both of which physicians should “read” in order to understand the cosmos. The two books are the Holy Scriptures and the Book of Nature. A seventeenth century Paracelsist named Thomas Tymme claimed that the study of the Book of Nature, or natural philosophy, was, as such, a way to glorify God.²⁰ What distinguished Paracelsians from other Hermeticists, however, was their belief that *alchemy* provided the necessary foundations to understanding the Book of Nature, through experimenting in laboratories and through analogy. For these men, the Creation of the world was a chemical event, which “. . . accounted for the production of the three principles as well as the four elements.”²¹ (Where some traditional medieval alchemists had accepted sulfur and mercury as the foundation of all metals, Paracelsus added salt. These three principles came to be known as the *tria prima*, which is one of the most enduring characteristics of alchemical theory, usually illustrated in the form of a triangle.²² Although there is some debate on the topic of whether Paracelsus intended for the *tria prima* to take the

alchemy many believed “metals were natural species, just like animals and plants, and were not interconvertible or transmutable.” (See Levere, *Transforming Matter*, 8.) Indeed, theories regarding the generative and reproductive properties of metals continued to be a topic of debate for centuries after Paracelsus. (See Hirai 2012, Hirai-Yoshimoto 2005, and Luzzini 2011.)

¹⁹ Paracelsus and Arthur E. Waite. *The Hermetic and Alchemical Writings of Paracelsus, Volume II*, 148.

²⁰ Debus, *The Chemical Philosophy*, chapter 2 (subsection: Chemistry and the New Science).

²¹ *Ibid.*

²² John Read, *Prelude to Chemistry: An Outline of Alchemy* (Cambridge: MIT Press, 1966), 27.

place of the four Aristotelian elements, many Paracelsists accepted both concepts and used each of them at their discretion. Some found the *tria prima* particularly attractive because it was commonly seen as analogous to the Holy Trinity.²³ Chemical philosophy went deeper than just a chemical interpretation of Creation, however. The proponents of this theory concluded that if Creation had been a chemical process, it followed that there should still be chemical processes at work in the world. The late Allen Debus, historian of science at the University of Chicago, explains that Paracelsians held a “. . . belief in the macrocosm-microcosm relationship: the universe was conceived to be a vast system with all its parts interconnected; in particular, man was seen as a small copy of the great world, and therefore it was valid to draw analogies between him and the earth or the universe as a whole.”²⁴ This macrocosm-microcosm concept is what enabled Paracelsians to apply chemical philosophy to medicine.

The prevailing medical wisdom of Paracelsus's time was based on Hippocrates' theory that the human body contains four humors (blood, phlegm, yellow bile and black bile), the imbalance of which causes illness. A sick person could be healed, in theory, if a physician could restore the balance of the four humors. Famously, one of the ways this was done was through “bloodletting,” or the draining of blood from feverish patients. Paracelsus, however, rejected the theory of the four humors outright, instead choosing to focus on chemical cures for illnesses. As a result of the macrocosm-microcosm medical philosophy, he pictured the human body as a sort of chemical laboratory, positing that bodily problems could be corrected by finding the appropriate chemical compound.²⁵ Bruce T. Moran, a professor of history at the University of Nevada, elaborates on Paracelsus's chemical philosophy:

“The world so constructed amounted to a gigantic pharmacopeia in which the heavens, as well as plants, animals, and minerals, brought their spiritual forces to bear upon individual parts of the human body. Portions of the terrestrial world could thus be made into medicines for treating specific illnesses by the physician who was led not by ancient texts, but who read instead the “book of nature” and was thus guided by experience.”²⁶

²³ Debus, *The Chemical Philosophy*, chapter 2 (subsection: Chemical Theory and the Elements).

²⁴ *Ibid*, chapter 2 (subsection: Chemistry and the Geocosm).

²⁵ Morris, *The Last Sorcerers*, 35.

²⁶ Bruce T. Moran, “The ‘Herbarius’ of Paracelsus” in *Pharmacy in History* 35 (1993): 99.

These chemical remedies were spiritually innate in nature, only hidden. The job of the physician was to recognize the appropriate qualities inside nature and interpret how they could be used pharmaceutically. Writes Paracelsus:

“ . . . since, in this place, the true basis of preparing remedies, in which lies the whole essence of medicine, is laid down and established, be well assured of this, that such a foundation must be extracted from the most secret recesses of Nature, and not from the imaginative brain, as a cook dresses a mess of pottage, according to his own judgment.”²⁷

In this sense, the alchemist physician does not *create* remedies as a painter would create a painting. Rather, “. . . whatever is poured forth from the bosom of Nature, he who adapts it to that purpose for which it is destined is an Alchemist.”²⁸ Here, Paracelsus emphasizes that alchemists contribute to human progress by procuring new remedies to ease the suffering of the sick *as well as* glorifying God by discovering the true virtues and remedies inherent within the natural world (Book of Nature).

Paracelsus did not believe his cures were magical, although he did sometimes describe them as miraculous. Instead, he insisted the cures were simply a part of nature. In his *Herbarius*, he explains the healing properties of the essence of the persicaria plant. He claims it is incomparable in its ability to heal open wounds, especially if his prescribed regimen is followed:

“ . . . one takes the plant and draws it through a fresh stream. Thereafter, one lays it on that [injury] which one wishes to heal, and this for as long as it would take to eat half an egg. Then one buries the plant in a moist place so that it will decay. In this way, the injury is made healthy. If I must tell you that some [people] make a cross over the wound and others, in addition, pray [when treating it], I should also add that such things are unnecessary. They do not belong to the cure, for there is [in the plant] an action that works naturally, not superstitiously and magically.”²⁹

This passage illustrates Paracelsus’s conviction that his chemical philosophy was sound. No magic or prayers would be necessary. One did not need God’s help to make the cure work, as God had already ordained the curative properties of the

²⁷ Paracelsus and Arthur E. Waite, *The Hermetic and Alchemical Writings of Paracelsus, Volume II*, 149.

²⁸ *Ibid*, 148.

²⁹ Paracelsus and Bruce T. Moran, *Herbarius*, in *Pharmacy in History* 35 (1993): 111.

plant at the time of Creation. It was the alchemist's task, then, to unlock the secrets of the Book of Nature and apply them to medicine.

When put into practice, Paracelsus's unconventional theories resulted in novel and useful medical advancements. His acceptance of the homeopathic Germanic folk tradition ". . . that like cures like, that the poison in proper dosage would also be the cure," influenced his followers and resulted in the introduction of inorganic compounds to chemical medicine. While often criticized for their use of potent metallic compounds and apparent toxins, Paracelsians proved to be on the right track. Their use was actually of medical importance, as many were included in the pharmacopeias of the seventeenth century. Mercury, in fact, later asserted itself as the only effective cure against syphilis and was widely used by many physicians who were also critics of iatrochemistry. Paracelsians were ever mindful of their alchemical heritage and proud to be distinguished from other chemical physicians by their meticulous observation of dosages and use of alchemy to extract only the valuable quality from the dangerous substances with which they worked.³⁰

Paracelsus's imagined world system, in which God was the "Master Chemist" and chemical processes explain all natural phenomena in the physical world and within the human body, gave him the theoretical framework he needed to prepare powerful medicines.³¹ However, the theoretical framework needed to be supported by practical experience and observation. Paracelsus's travels had introduced him to Germanic folk medicine. He had observed the cures of healers ignorant of Galenic philosophy and he incorporated these observations into his own medical practices.³² Thus, Paracelsus combined his theoretical ideas about chemistry with the practical medical results he had personally observed. In this way, the interaction of the theoretical and the practical led to the foundation of Paracelsus's work, as it had for many alchemists before him.

III. The Reception and Controversy of Paracelsianism

The controversy of Paracelsianism began with Paracelsus himself. An excellent illustration of this is his time at the University of Basel. After he had spent several years wandering around Europe as a young man, Paracelsus returned to the city of Basel and the Swiss university where he himself had

³⁰ Paracelsus and Bruce T. Moran, *Herbarius*, in *Pharmacy in History* 35 (1993): 111.

³¹ Principe, *The Secrets of Alchemy*, 128.

³² Allen Debus, "The Chemical Philosophers: Chemical Medicine from Paracelsus to Van Helmont," *History of Science* 12 (1974): 235.

studied. He had been offered a position as a lecturer there.³³ His idiosyncrasies immediately stirred up controversy and annoyance among his colleagues. These included lecturing and writing in his native Swiss German vernacular instead of Latin, inviting the general public to attend his lectures, refusing to participate in the university's "act of reception as an external graduate" (perhaps because he would have had to produce a diploma from another university, and it is suspected that he did not have one)³⁴ and "promoting the use of German medicinal plants over the more established classical Mediterranean ones."³⁵ When he first arrived at the university he reportedly performed a public burning of the medical texts of ibn-Sīnā (Avicenna), which was a symbolic rejection of the canonical medical education of the time.³⁶ To the faculty he released a dissenting proclamation, his *Intimatio*, in which he announced that he would be lecturing for two hours every day, not on the accepted medical curriculum of the time, but rather his ". . . original experience in unraveling the secrets of nature and disease."³⁷ On one occasion he invited the faculty to attend a lecture, promising he would be revealing the "ultimate secret" of medicine. When they arrived, Paracelsus began by unveiling a plate of feces. Insulted and disgusted, the doctors in attendance stood up to leave. Paracelsus shouted after them, "If you will not hear the mysteries of putrefactive fermentation, you are unworthy of the name of physicians."³⁸ Obviously he became unpopular rather quickly. Paracelsus only lasted for ten months at the University of Basel before he a dispute with the municipal authorities resulted in his being chased out of the town, after which he began traveling once more.³⁹

It is now easier to understand why Paracelsus was so disliked by other physicians. Dane T. Daniel, historian at Wright State University, asks, "How could the medical establishment, which was grounded in Hippocratic-Galenic theories, e.g., the traditional humoral theories consistently and vehemently

³³ Walter Pagel, *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance* (Karger Medical and Scientific Publishers, Basel: 1982), 20.

³⁴ *Ibid.*

³⁵ Principe, *The Secrets of Alchemy*, 127-128.

³⁶ This symbolic rejection, however, should not lead us to believe that Paracelsus and other iatrochemists were completely unguided by the works of Avicenna—he inspired Paracelsus's interest in the idea of spontaneous generation, for example.

³⁷ Pagel, *Paracelsus*, 20.

³⁸ Arthur Edward Waite, preface to *The Hermetic and Alchemical Writings of Aureolus Philippus Theophrastus Bombast, of Hohenheim, called Paracelsus the Great* (London: J. Elliot and Co., 1894), xiii.

³⁹ Pagel, *Paracelsus*, 21-22.

chastised by Paracelsus, not help but be angered and threatened?”⁴⁰ It is likely that established physicians felt their expertise was insulted by Paracelsus, who was known for his pompous nature and flamboyant disregard of authority. His reputation was that of being a perpetually drunk but lucid surgeon who frequently wandered about the countryside carrying a sword named Azoth.⁴¹ His written criticisms were often indelicate, such as in his *Herbarius* when, after providing an apparently foolproof cure for dropsy using an alchemical preparation of hellebore and iron, he chastised, “Do it, you doctor of humors, then timidly shut your trap. What an ass! It is a great disgrace that you cannot heal dropsy. For you have no idea of the correct method and do not know where you are going. Learn to walk along the right path and do not wander in the labyrinth.”⁴² Older doctors felt threatened, too, by the fact that Paracelsians wanted chemical medicines to *replace* the traditional Galenic cures and not simply be added to the medical literature.⁴³ Furthermore, Paracelsus’s theological ideas gave further fodder to his critics: while he began his life as a Catholic, he became known as a religious radical as his life progressed. All of this added to his reputation as an ignominious figure.

Unsurprisingly, Paracelsus continued to manufacture controversy long after his death, though his theories continued to attract many followers. It is difficult to overstate Paracelsus’s later intellectual influence on the European medical and chemical world. Even so, Allen Debus claims this influence would have been hard to predict at the time of his death in 1541. Very little of Paracelsus’s works had been published during his lifetime. In the 1550s, however, a flood of his texts began appearing touting and stories of his miraculous cures.⁴⁴ His writings were then disseminated across Europe and became quite popular, especially among theological and medical renegades.⁴⁵ Some of the noted authors who interacted with Paracelsian ideas include Girolamo Cardano (1501-1576),⁴⁶ Robert Boyle (1627-1691),⁴⁷ Johann Joachim Becher

⁴⁰ Dane T. Daniel, “Coping with Heresy: Suchten Toxites, and the Early Reception of Paracelsus’s Theology” in *Chymists and Chymistry: Studies in the History of Alchemy and Early Modern Chemistry*, ed. Lawrence M. Principe (Sagamore Beach, MA: Science History Publications, 2007), 54.

⁴¹ *Ibid.*

⁴² Paracelsus and Bruce T. Moran, *Herbarius*, 110.

⁴³ Debus, *The Chemical Philosophy*, chapter 2 (subsection: The New Medicines).

⁴⁴ Debus, *The Chemical Philosophy*, chapter 2 (Introduction).

⁴⁵ Principe, *Secrets of Alchemy*, 129-130.

⁴⁶ Girolamo Cardano, *De subtilitate libri 21* (Norimbergae: Apud Ioh. Petreium, 1550).

⁴⁷ Robert Boyle, *Tracts* (London: Printed by W.G. and are to be sold by M. Pitt, 1674).

(1635-1682),⁴⁸ Robert Fludd (1574-1637),⁴⁹ Daniel Sennert (1572-1637),⁵⁰ Jan Baptist Van Helmont (1579-1644),⁵¹ and Athanasius Kircher (1602-1680).⁵² Scholars such as Debus and Walter Pagel have attempted to classify responses to Paracelsus in the medical world, placing them into three categories: supporters, dissenters and compromisers.⁵³ Supporters (the Paracelsians) were often opposed and heavily criticized by the far more numerous dissenters. Supporters, compromisers, and dissenters could be found all over Europe, often engaging in public disputes.

Llorenç Coçar was a prominent practitioner of chemical medicine with “clear Paracelsian affinities” in Valencia, Spain.⁵⁴ He held the apparent support of the Spanish monarchy, as he was named *protomédico* by Phillip II, a post that gave him the responsibility of overseeing the creation and sale of medicine in Valencia pharmacies. Soon after his appointment, however, he began to receive vehement resistance from colleges, apothecaries and others, who believed he was unfit for the job of *protomédico* on the grounds that he practiced iatrochemistry.⁵⁵ The opposition became so intense that Coçar eventually filed a suit against several groups, claiming he only wanted to be allowed to perform the job to which he had been appointed. Importantly, “. . . the apothecaries relied on the authority of university physicians and Galenic medicine to establish the inefficacy and dangerousness of Coçar’s remedies.”⁵⁶ Coçar, a chair at a medical college, suffered strained relationships with his colleagues—often, they opted to simply ignore his medical proposals in professional meetings.⁵⁷ After Coçar’s death in 1592, chemical medicine in Valencia entered into a long period of

⁴⁸ Johan Joachim Becher, *Actorum Laboratorii chymici Monacensis, seu Physicae subterraneae libri duo...* (Francofurti : Imp. Joh. Davidis Zunneri, 1669).

⁴⁹ Robert Fludd, *Philosophia moysaica* (Goudae: Excudebat Petrus Rammazenius, bibliopolae, 1638).

⁵⁰ Daniel Sennert, *Epitome scientiae naturalis* (Wittenberg, 1618).

⁵¹ Jan Baptist Van Helmont, *Opera omnia* (Francofurti: Sumptibus Johannis Justi Erythropili, Typis Johannis Philippi Andreae, 1682).

⁵² Athanasius Kircher, *Mundus subterraneus in XII libros digestus* (Amsterodami: Apud Ioannem Sansonium et Elizeum Weyerstraten, 1665).

⁵³ Jole Shackelford, “Early Reception of Paracelsian Theory: Severinus and Erastus,” *The Sixteenth Century Journal* 26 (1995): 124.

⁵⁴ Marialuz Lopez Terrada, “The Making of Chemical Medicines in Valencia during the 16th Century: Llorenç Coçar” in *Chymia: Science and Nature in Medieval and Early Modern Europe*, ed. Mar Rey Bueno et al. (Newcastle upon Tyne, UK: Cambridge Scholars, 2010), 262.

⁵⁵ *Ibid*, 262-265.

⁵⁶ *Ibid*, 267.

⁵⁷ *Ibid*.

decline, as there seem to have been few physicians practicing iatrochemistry in Spain at the time.⁵⁸ This dispute between Coçar and the medical establishment of his city serves as a representative illustration of the tension between traditional and Paracelsian medicine in the sixteenth century.

Another controversy surrounding Paracelsianism was the aforementioned conviction of Paracelsists that some toxins (including “mercury, arsenic and antimony”⁵⁹) could be used as medicines. Allen Debus provides details of an exchange between two Frenchmen, Loys de Launay and Jacques Grévin, in the latter half of the sixteenth century. De Launay had become enthusiastic about the medical use of antimony after reading a manuscript by Pietro Andrea Mattioli. Grévin, a physician, replied that while he was not averse to the practice of alchemy itself, he believed antimony was dangerous, and he had the advantage of having taken it himself, writing that “. . . It was indeed a purgative, but a violent one that left him weakened for eight days.”⁶⁰ Responses between the two were sent back and forth, serving as a public platform for the debate about the use of chemical medicine. The published tracts between de Launay and Grévin were, Debus indicates, a controversial debut of Paracelsian ideas in France.⁶¹

In England there lived one of the strongest and most famous critics of Paracelsus: Thomas Erastus, also a Swiss physician. In 1572, Erastus wrote a tract, *Disputationes de medicina nova*, which lambasts Paracelsian philosophy and everything to which it leads. He appears to personally detest Paracelsus, even resorting to name-calling at one point. Notably, “Erastus opens Paracelsian metaphysics to criticism on theological and religious grounds by characterizing his views as impious, even heretical.”⁶² The criticism did not do any favors for Paracelsus’s popularity, although ironically, many English physicians only heard of Paracelsus by way of Erastus’s critique.⁶³ Perhaps most importantly, Jole Shackelford, historian of medicine at the University of Minnesota, believes that Erastus’s criticism frightened Severinus, an early follower of Paracelsus, and deterred him from composing more works on iatrochemistry, which of course raises the question of how many other Paracelsists were silenced in this way.

⁵⁸ Ibid, 269-270.

⁵⁹ Principe, *Secrets of Alchemy*, 130.

⁶⁰ Allen Debus, *The French Paracelsians: The Chemical Challenge to Medical and Scientific Tradition in Early Modern France* (Cambridge: Cambridge University Press, 1991), 21-26.

⁶¹ Ibid, 29-30.

⁶² Shackelford, “Early Reception of Paracelsian Theory,” 127.

⁶³ Ibid., 126.

Shackelford fears Paracelsian theory was crippled by Erastus's early condemnation of it as heretical.⁶⁴

IV. Conclusion

In consideration of the research delineated in the previous paragraphs, we may conclude that the Paracelsian legacy is a threefold one. First, Paracelsus was chiefly an alchemist, and he challenged the medical establishment of his day in historically alchemical fashion, marrying theory and practice. Rather than just studying the ancients, Paracelsus wandered across Europe and utilized folk remedies, a close analysis of nature and knowledge gained from centuries of metallurgical crafts, incorporating all of this into his theory of how the world was formed. At the same time, he developed his chemical philosophy, which guided his practical work. Tara Nummedal writes that "Like medicine, alchemy has always been both an intellectual and a practical pursuit. . . . Practitioners frequently took books with them into the laboratory; likewise, recipes, descriptions of processes, and images of distilling equipment found their way back into alchemical texts."⁶⁵ A long line of alchemists who allowed philosophy and experimentation to guide each other came before Paracelsus. The Paracelsians appropriated this alchemical heritage and used it to transform the medical world.

The second piece of Paracelsus's legacy is that he utilized what a modern scientist might call an experimental approach in his quest for making sense of how the world worked. He aimed to explore his theories, even if it meant challenging authority and being ridiculed by his colleagues. He investigated the chemical foundations of life itself. He sought a way to understand the composition of the universe, and this without any knowledge of the chemical elements. While he was not a chemist in the modern sense, he did help pave the way for the development of chemistry. Experimentation and a questioning spirit led him to become the renegade he undoubtedly was. (Francis Bacon, the much celebrated "Father of Empiricism," supposedly "read the works of Paracelsians with great care."⁶⁶) No, Paracelsus did not have the answers, but his philosophy and his medical cures contributed to the evolution of medical and scientific knowledge both.

⁶⁴ *Ibid.*, 124.

⁶⁵ Tara Nummedal, "Words and Works in the History of Alchemy," *Isis* 102 (June 2011): 331.

⁶⁶ Debus, *The Chemical Philosophy*, chapter 8 (subsection: The Chemical Philosophy in Retrospect).

Finally, while Paracelsus's chemical philosophy did provide some contributions to medical knowledge, the so-called "Paracelsian Debates" which ensued after Paracelsus's death were significantly more important. Allen Debus admits that if these debates had not been so contentious, the Paracelsians would have far less historical importance. As it happened, the debate over chemical philosophy was ". . . one of the most crucial scientific and medical problems of the late sixteenth and seventeenth centuries."⁶⁷ Everyone within the scientific and medical communities, whether they supported chemical philosophy and medicine or not, was forced to evaluate their thoughts on Paracelsus's theology, his rejection of the medical canon and the severe critiques of men like Thomas Erastus.⁶⁸ Furthermore, Paracelsus's personal character likely contributed to his lasting legacy. If Paracelsus had not been such a controversial figure, had his methods been more tolerable or his personality more subtle, his chemical philosophy may have been overlooked by his Galenic opponents. Even more significant, his followers adopted his iconoclastic attitude, insisting on a complete medical revolution rather than a mere tolerance for, or incorporation of, their ideas. This stubborn inclination may have been what provoked their opponents to respond with such vitriol (and perhaps it was even designed to do so). Either way, there is no doubt that Paracelsianism inspired spirited debates about matters that hadn't been debated in centuries.

The confidence in Paracelsus's writings would suggest that he felt his chemical philosophy was the key to understanding the universe. Indeed, he appears to be as sure of it as other alchemists were sure of their ability to make gold or the fabled Philosopher's Stone. While modern science appears to illuminate the erroneous nature of these claims, it must be remembered that alchemists, like philosophers, were in the business of pursuing knowledge, and in this sense they actually helped pave the path to modern science. While alchemy's detractors might call it a pseudoscience or an esoteric cult—and there are some truths in those claims, to be sure—Paracelsus proves that alchemy *inspired* much more. As a true alchemist, he did not rely solely on books and the wisdom of the ancients; he also sought practical experience. He insisted upon investigation of the natural world, experimentation in the laboratory and, if necessary, outright rejection of the status quo. As a result, Paracelsus and his chemical philosophers inspired a renewed examination of traditional medical thought.

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⁶⁷ Ibid.

⁶⁸ Ibid.

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