



Why was Alchemy Considered a *Pseudoscience*? Paracelsianism and the Controversies between the Scholars of the 16th and 17th Centuries

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Abstract

This paper has two main goals: firstly, to display the controversies between the physicians, natural and alchemical philosophers of the Scientific Revolution; and, secondly, to explain the factors which contributed in considering alchemy a *pseudoscience*. Through the study of primary and secondary sources as well as the comparative history it will be shown that the traditional historical view about the delay of the *Chemical Revolution*, according to which alchemy should not be considered a “science” and did not participate in the *Scientific Revolution*, was not created by the historians, but by the same alchemical philosophers of the sixteenth and seventeenth centuries, as they began to reject basic principles of alchemy by emphasizing it as a *pseudoscience*. Many factors contributed to this accusation, but this paper supports that one of the most important was the development and spread of Paracelsianism and the polemical debate existed among the *Paracelsians* (Paracelsus’s followers) and *anti-Paracelsians* (Paracelsus’s attackers) about the nature and scientificity of alchemy, as many supporters and opponents of Paracelsus labeled each other *pseudo-Christians*, *pseudo-philosophers* and *pseudo-chemists*.

Keywords: Paracelsianism; Anti-Paracelsians; Iatrochemistry; Scientific communities; Pseudoscience

Introduction

It is well known that Paracelsus wanted and tried to overthrow the theories of medieval alchemy, Aristotelianism and Galenic medicine supporting that he would promote the real knowledge and purpose of alchemy. As he states:

He will learn nothing from there is like the Heathen Masters and Philosophers, who follow the Substities and Crafts of their own Invention and opinions, such as are Aristotle, Hippocrates, Avicenna, Gallen etc, who grounded all their ARTS upon their own Opinions onely. And if it any time they learned anything from Nature, they destroyed it again with their own Phantasies, Dreams or Inventions, before

they came to the end thereof;¹

For him the alchemists must not follow Aristotle’s or Gallen’s pseudo-theories and alchemy should be put at the service of medicine. Thus, through his alchemical philosophy he prompted the alchemists to reject the previous theories explaining that his chymiatra is “superior” to the other theories and supporting a radical change. Indeed, Paracelsus’s philosophy, and especially his iatrochemistry, succeeded to shake the foundations of existing knowledge

1 Paracelsus, *Of the Supreme Mysteries of Nature. Of the Spirits of the Planets. Of Occult Philosophy. The magical, sympathetical and antipathetical cure of wounds and disease. The mysteries of the twelve signs of the zodiac*, trans. R. Turner, pr. J.C. for N. Brook and J. Harison (London, 1656), *The Prologue*, B2.

by offering a strong challenge to the authority of Galenic medicine and by extending or changing medieval alchemical theories. The significance of the Paracelsian theory became apparent as early as the beginning of the sixteenth century, when major scholars became followers of Paracelsus, such as Adam de Bodenstein (1528-1577), and began to edit and publish his manuscripts regardless of their authenticity. In fact, the chronicler and historian Daniel Specklin regarded the year 1517 as one of particular importance in the cultural history of Europe, marked by the theory of Paracelsus, who became known as the Luther of medicine.² Petrus Severinus (1542-1602), Michael Sendivogius (1566-1636) and Oswald Croll (1563-1609) were among the first well-known physicians to publish detailed responses about the German reformer. Particularly Severinus is considered as the most important of his followers, because through his book "Idea Medicinae (1571)" he explained Paracelsus's metaphysics and promoted his theory in whole Europe. As a result, during the second half of the sixteenth century, the manuscripts of Paracelsus circulated, studied and printed, and his alchemical philosophy (especially his matter theory of *tria prima*) was embraced by many scholars.

Paracelsus's alchemical philosophy was adopted, integrated and modified into many areas in different ways. Many physicians, natural and alchemical philosophers connected Paracelsianism with theological and political matters as well as with new philosophical streams, some of which were characterized by the anti-Paracelsians as *sects*, such as Rosicrucianism. For example, many Rosicrucians, who most of them were respectable scientists and some of them were members of the *Royal Society of London* or had connections with members of the *Royal Society*, like Michael Maier (1568-1622), were inspired by Paracelsian theory, which they used by including it even in a political context³ in order to promote and serve their own theories and personal interests. Hence, although Paracelsians shared some common ideas or features, such as that they believed in the "two-book" conception of nature⁴ and in the *action at distance*, or that they accepted the theory that the *like occurs the like*⁵, there was diversity in the Paracelsian dogma, because, depending on the country and their religious or political beliefs, they changed and modified their teacher's

theory and often signed their own works under the name of Paracelsus.

However, simultaneously with the development and adoption of the Paracelsian dogma, there was an increasing debate about the "charlatany" of the Paracelsian theory, especially in the domain of medicine, as many Galenic doctors accused the Paracelsians of disrespecting human life and abusing the need of patients. While many scholars, some of whom were alchemical philosophers themselves, also criticized Paracelsus's philosophy by highlighting mainly his theological incorrectness. Therefore, throughout the sixteenth century the supporters and opponents of Paracelsus labeled each other "pseudo-Christians, pseudo-prophets, pseudo-philosophers, pseudo-alchemists, pseudo-chemists and pseudo-astronomers."⁶ In France, Paracelsianism reached at its zenith between 1610 and 1650 and the medical community was quickly split into Galenist and Paracelsian alchemical camps that violently argued about the therapeutic usefulness of alchemical prepared mineral-based drugs. Accordingly, in Germany, the Paracelsianism was mostly connected with religion. Protestant ideologists drew the Paracelsians into their seemingly endless debates about the nature of medicine and what the implications of the Paracelsian theory are used for the religious dogma and secondary texts proliferated.⁷ It is really interesting that even if in Germany Paracelsianism was considered a threat for the protestant church, in England Paracelsianism was identified with the radical Protestantism. The English Paracelsianism largely featured after 1650, where the English Paracelsians had to confront both Aristotelians and Galenists. The Paracelsians attacked on Galenists physicians supporting that only they could cure any kind of illness, unlike the Galenists who were based on outdated perceptions and, of course, did not know how to prepare medicines. Paracelsians declared that their vision was to replace the old doctrines with the new Christian, Neoplatonic, Paracelsian theory, which, as they claimed, could analyze all natural phenomena. Thereupon, it becomes obvious that Paracelsus's theory

2 Webster Charles, *From Paracelsus to Newton: Magic and the Making of Modern Science* (Dover Publications (republication form Cambridge University Press, 1982), 2005), 3-4.

3 Smith Bradford, "Resisting the Rosicrucians: Theories on the Occult Origins of the Thirty Years' War", *Church History and Religious Culture* 94(4) (2014): 415, 417.

4 Priesendorf Emma, "Paracelsianism and the Theoretical Foundation of Chemical Medicine", *History Matters* 12 (2015): 71.

5 Debus G. Allen, *Man and Nature in the Renaissance* (Cambridge University Press, 1978), 33-51.

6 Starkey George, "Natures explication and Helmont's vindication. Or A short and sure way to a long and sound life: being a necessary and full apology for chymical medicaments, and a vindication of their excellency against those unworthy reproaches cast on the art and its professors (such as were Paracelsus and Helmont) by Galenists, usually called Methodists. Whose method so adored, is examined, and their art weighed in the ballance of sound reason and true philosophy, and are found too light in reference to their promises, and their patients expectation. The remedy of which defects is taught, and effectual medicaments discovered for the effectual cure of all both acute and chronical diseases", pr. E. Cotes for Thomas Alsop (London, 1657), Chap. I, 48. See also Frietsch Ute, "The Boundaries of Science/ Pseudoscience" (2015): paragraph 10 (available online in: <http://ieg-ego.eu/en/threads/crossroads/knowledge-spaces/ute-frietsch-the-boundaries-of-science-pseudoscience#>).

7 Shackelford Jole, "Early Reception of Paracelsian Theory: Severinus and Erastus", *The Sixteenth Century Journal* 26(1) (1995): 123.

caused so strong reactions that almost all the scholars of that period dealt with the Paracelsian doctrine, regardless of whether they supported it or opposed it, and that is why Paracelsianism is considered the main reason that influenced alchemy's *scientificity*.

Why was Alchemy Considered a Pseudoscience?

Already from the 1570s there has been a huge segregating between the scholars who followed Paracelsus, *Paracelsians*, his attackers, *anti-Paracelsians*, and the *compromisers*. *Compromisers* are usually labeled the alchemists, who were not followers of Paracelsus, but many times, even if they accused him, they were inspired by his doctrines and tried to use them in their theories. Many Paracelsians tried to adopt and modify Paracelsus's theory in order to attack to their "scientific opponents" and identify themselves as "scientists." Petrus Severinus emphasizing that Galen's remedies were inadequate, praised Paracelsus, although he found difficult to comprehend his writings. Wanting to create a new alchemy, which could coexist with Galenism and Lutheran church of Denmark, Severinus through his "Idea Medicinae philosophicae (1571)" presented Paracelsus as a medical innovator⁸ advocating an eclectic Paracelsianism. His Severian Paracelsianism had strong support within the government and university of Denmark until the seventeenth century. For example, Johannes Pratensis (1543-1576), professor of medicine at the University of Copenhagen, inspired by the Severian Paracelsianism and taught within the university the Paracelsian medicine along with the traditional curriculum⁹. From the 1660s onwards, especially in the English scene Paracelsians' polemical debates reach a peak, as Noah Biggs, John Webster (1610-1682), George Thomson (1619-1676), and George Starkey (1628-1665) and other important alchemists and physicians launched virulent attacks on Galenic medicine through their works. Robert Fludd (1574-1637) answering in Marin Mersenne's (1588-1648) severe criticism called him a "roaring, bragging, and fresh-water Pseudophilosopher."¹⁰ In his "Matoeotechnia medicinae (1651)" Biggs attacked on the medical establishment stressing that the Galenic physicians had relied upon fallacious remedies "for they went (...) to the immeasurableness of the imaginary fain'd humors," while the Paracelsian *Chymistry* is superior because it

penetrates the "hidden things of nature."¹¹ Accordingly, in 1657 Starkey's works represent an attempt to prove the superiority of the *science* of alchemy as opposed to Galenism. Starkey always accused, through his published works, Galenic physicians and a great example of his "polemical" work is "Natures Explication & Helmont Vindication," which was opposed to Aristotelians and Galenists¹². While, in 1665 George Thomson also attacked on Galenic physicians through his "Loimologia (1665)." What is really fascinating about the polemical oeuvres of these Paracelsians is that not only did they want to reply and support their theories against their opponents, but they also tried to promote their own "scientific community" according with the standards of *Royal Society of London* and *College of Physicians*. That period many Paracelsian alchemists, like John Webster (1610-1682), entered or had links with the *Royal Society of London*, despite the fact that many respectful members of the *Royal Society* called Paracelsianism a "sect." Inspired by them, the Paracelsians wanted to establish their own scientific *Society of Chemical Physicians*. Bearing in their mind the standards of the *College of Physicians* and *Royal Society* and the harsh criticism of their members to them, Paracelsians supported their own "scientific community" through their works. They realized that only if they attack on morality of their opponents, they will be able to identify themselves as *scientists*. Two important examples of how the alchemists tried to rename themselves through their polemical works are George Thomson and Robert Fludd. Fludd in his work "Summum bonum (1629)" tried to differentiate between the parts of science and magic, which he viewed as *scientia* and *sapient vera* (which are unproblematic parts) and those which are *pseudosophia* and *cacosophia*. With this distinction Fludd tried to "purify" alchemy of doctrines, which may be regarded by anti-Paracelsians as a *pseudoscience* or "black magic." Respectively, Thomson in his "Alchymical Trial of the Galenists (1665)" tried both to oppose to Galenists and to promote the use of new terms. Through the terms of "Alchymists," "alchymy," and "Chymistry," Thomson and many other Paracelsians redefined themselves as "scientists" in order to differentiate from their medieval alchemical ancestors and the charlatans of their era.

8 Shackelford Jole, "Early Reception of Paracelsian Theory: Severinus and Erastus" (1995): 124.

9 Shackelford Jole, "Paracelsianism and the Orthodox Lutheran Rejection of Vital Philosophy in Early seventeenth-Century Denmark", *Early Science and Medicine* 8(3) (2003): 215.

10 Huffman H. William, *Robert Fludd and the end of the Renaissance* (Routledge, London and New York, 1988), 67.

11 Biggs Noah, *Mataeotechnia medicinae praxeos. The Vanity of the Craft of Physick, or, A new dispensatory wherein is dissected the errors, ignorance, impostures and supinities of the schools in their main pillars of purges, blood-letting, fontanels or issues, and diet, &c., and the particular medicines of the shops : with an humble motion for the reformation of the universities and the whole landscap [sic] of physick, and discovering the terra incognita of chymistrie : to the Parliament of England*, pr. Edward Blackmore (London, 1651), 50.

12 Starkey George, "Natures Explication and Helmont's Vindication, Chap. 1" (1657), 2-36. See also Clericuzio Antonio, "From van Helmont to Boyle. A Study of the Transmission of Helmontian Chemical and Medical Theories in the Seventeenth-Century England", *The British Journal for the History of Science* 26(3) (1993): 321.

Correspondingly, many anti-Paracelsians studied Paracelsus in detail as well as the philosophical theories of his followers, so that they could overthrow him by connecting Paracelsian philosophy with religious and political matters. The polemical tone of anti-Paracelsians critics became more strident throughout the sixteenth century, as critics (who usually hold university positions) challenged the philosophical and material claims of alchemy and accused alchemists for *charlatanism*, *blasphemy* and *illiteracy*.¹³ It is really important the fact that the Paracelsian ideas, especially in English early medical literature, indicate that many English physicians, alchemical and natural philosophers first learned about Paracelsus through Thomas Erastus's (1524-1583)¹⁴ and Andreas Libavius's (1550-1616) censure. These two scholars intensively criticized the work of Paracelsus and Severinus and are considered as two of the most important attackers of the Paracelsian theory, as they accused Paracelsianism for heresy. Erastus's "Disputationum de medicina nova Paracelsi (1571 first ed.)" and "De occultis pharmacorum potestatibus (1574)" constitute the most important anti-Paracelsian works, which presented and spread Paracelsian ideas. Into these works Erastus began a religious campaign against the heresy and sorcery of Paracelsianism. In fact, he stressed that it was not necessary to study the pharmacological aspects of Paracelsus, because Paracelsian alchemy is *heretic* and, according to him, Paracelsus was not a scientist. So, Erastus criticized the Paracelsian theory based on the work of Severinus indicating that Paracelsus's works should not be studied. It is interesting though, that he relied on the Severian Paracelsianism, probably because he had not studied the authentic works of Paracelsus or he was not able to understand his works. Thus, he chose to study Paracelsus through the work of Severinus. This was really common that period, as many important theories were studied and became well known through the analysis of other scholars. A great example of this phenomenon is the spread of *Newtonianism*, as many scholars followed Newton's theory without having study his work *Principia*, instead they were based on the interpretation of this work by other scholars. Hence, Erastus accused the Paracelsians mostly because they were not religious people, but "Theophrastines."¹⁵ "neither Arius, Photin, nor Mohamed nor any Turk or heretic were ever so heretical as this unholy magus."¹⁶ His works influenced important scholars, like Conrad Gessner (1516-1565) and Johannes Crato von Crafftheim (1519-1585), who

saw Paracelsus as an Arian-heretic and bewitcher. At the same time, many *Paracelsians* accused Erastus for Arianism supporting that the Galenists, who followed him, were corrupted school teachers, just like Thomas Moffet (1553-1604) did through his work "De anodinis medicamentis (1578)." While some other *Paracelsians*, like Bernard Penot (1519-?), supported that Paracelsus was a religious man, who was inspired directly by God. Indeed, Oswal Croll proudly promoted the "new religion" of Paracelsus "Theophrastia Sancta," as the "right religious." For him Paracelsus's theory presents the truth word of God; it is a religious into which "The book of Grace and the book of nature are joined together"¹⁷ and that is why all the physicians should follow Paracelsus. While Michael Maier trying to respond in Erastus and Erasmus's satirical "Alchumistica" referred to alchemy as "chymia" or "chemia" and its practitioners as "chymici" with main goal to distinguish his science from the charlatanism of some pseudo-alchemists.¹⁸ Hence, it becomes clear again how and why some alchemists tried to promote the use of new terms in order to be accepted by their colleagues as *scientists*.

Andreas Libavius also considered Paracelsus's theory as intertwined with religious dissent in the earliest Rosicrucian texts.¹⁹ Due to the fact that the Paracelsian science was an integral and important part of the Manifestos of Rosicrucians, Libavius accused Paracelsus for being an unfaith man, who was possessed by demonic powers and prompted heresy. He criticized the Paracelsian and Rosicrucian theories and dogmas stressing that Paracelsians promoting *non-scientific* and "magical" theories, which harm alchemy and religion. He considered the meetings of the Paracelsian alchemists sectarian and even compared them to "like the witches Sabbath and its members like witches."²⁰ For him these foremost opponents of Aristotle practiced their magic in their master's *Philosophia sagax*²¹. Nevertheless, Libavius was not so rigorous with the Paracelsians, as there were times where he expressed them his respect. For instance, he showed support to Du Chesne (1544-1609) and Turquet de Moyenne (who were Paracelsians), when their alchemical

13 Bloemendal Jan, Fantazzi Charles, Ford Philip, *Brill's Encyclopaedia of the Neo-Latin World* (Leiden, Boston, 2014), 708.

14 Shackelford Jole, "Early Reception of Paracelsian Theory: Severinus and Erastus" (1995): 124, 126.

15 Bloemendal Jan, Fantazzi Charles, Ford Philip, *Brill's Encyclopaedia of the Neo-Latin World*, (2014), 708.

16 Erastus Thomas, *Disputationum de medicina Nova Philippi Paracelsi Pars Prima-Quarta* (Basel, 1572), 389.

17 Croll Oswald, *Veterani Haffi Basilica Chymica* (Frankfurt, 1611), 69. See also Grell P. Ole, *Paracelsus: The Man and his Reputation, his Ideas and their Transformation* (Grell, Brill: 1998), 152-165.

18 Bloemendal Jan, Fantazzi Charles, Ford Philip, *Brill's Encyclopaedia of the Neo-Latin World* (2014), 710.

19 Moran T. Bruce, "Danish Paracelsianism vs. Lutheran Orthodoxy", *Pharmacy in History* 38(4) (1996): 184.

20 Smith Bradford, "Resisting the Rosicrucians: Theories on the Occult Origins of the Thirty Years' War", *Church History and Religious Culture* 94(4) (2014): 419.

21 Forshaw J. Peter, "Paradoxes, Absurdities, and Madness: Conflict over Alchemy, Magic and medicine in the Works of Andreas Libavius and Heinrich Khunrath", *Early Science and Medicine* 13(1) (2008): 54.

medicine was censured by the Parisian medical faculty²². Thus a closer examination of Libavious's works shows that he was not a severe foe, as many historians usually support, but he tried to link the Paracelsian *spagyria* to atomism through the intermediary of Aristotle's "Meteorology." Into his works Libavius did accept that the Paracelsian *semina* theory trying to reconcile the Democritean atomism and Aristotelian hylozoism by viewing *semina* as *atoms* manifesting unbreakable unions of secret first principles²³. In addition, he drew support from Paracelsian works in the defense and promotion of chrysopoeia and certain kinds of chymiatra²⁴ admitting that these alchemical physicians did indeed enter inside the universities and help in the establishment of the chemical medicine²⁵. Thereupon, Libavius truly supported alchemical medicine and constitutes a great example of how an alchemist chose to become an anti-Paracelsian, because he wanted to "purify" alchemy from "magic." Libavius strongly opposed to Paracelsians and called alchemy "chymistry," in order to save alchemy from criticism and differentiate it from the past and to identify alchemy as a "real science," so as to be incorporated into the corpus of universities. On that account, Libavius's main aim was alchemy to be taught properly inside universities, and not to be adopted by anyone who, without having a university degree, identifies himself as a physician or chymist. And probably, one of the main reasons of his attack on Paracelsianism was that the Paracelsians claimed that anyone, who is interested in alchemy, could be taught by them without having to study at a university.

However, the most interesting protagonists of these polemical debates are not the *Paracelsians* or *anti-Paracelsian*, but the *compromisers*, or as I prefer to call them the "pseudo-antiParacelsians" or "Crypto-Paracelsians," because, even though they criticized Paracelsus, they were influenced by his theory and, despite denying it, they often used the Paracelsian terminology or concepts in their own theories, such as Walter Charleton (1619-1707), van Helmont (1580-1644) and Robert Boyle (1627-1691) did. The pseudo-antiParacelsians are really significant as through their works and polemical debates the causes about why alchemy was confronted by many scholars as a *pseudoscience* become more comprehensible. Van Helmont and Robert Boyle, although they considered themselves alchemists and respected Paracelsus as an important teacher, tried to distinguish alchemy from occult forces and dogmas in order to make it

a respectable *science*. For example, when Pierre Gassendi (1592-1655) and Mersenne attacked Fludd describing him as a "practitioner of magic," van Helmont supported them by expressing a negative opinion of his colleague Fludd. In fact, van Helmont tried to distinguish the "respectable" followers of Paracelsus from those like Fludd and into his philosophy he criticized specific Paracelsian doctrines, like the doctrine of signatures²⁶. While, Boyle in his work "Sceptical Chymist (1661)" called *Paracelsians* "vulgar spagyrist,"²⁷ despite the fact that if someone examines the same work he can understand that he was inspired by Paracelsian ideas and used many Paracelsian terms.

Furthermore, Walter Charleton in his works "The Darkness of Atheism Dispelled by the Light of Natures (1652)" and "Physiologia-Epicuro-Gassendo-Charltoniana (1654)" decried the Paracelsian doctrines and alchemical vitalism with main goal to promote Gassendi's matter theory. However, in the "Spiritus Gorginicus" he made references to hermetic authors, like Petrus Severinus, and in the "Ternary of Paradoxes" he translated the van Helmont's essays "The Magnetic Cure of Wounds," "The Nativity of Tartar in Wine," and "The Image of God in Man." Also, in the "Prolegomena" he referred to Robert Fludd and Sir K. Digby, clarifying that he had studied the hermetic literature and that he believed in a kind of spiritual influential interdependence of various parts of the universe. Therefore, despite the fact that he criticized Paracelsians, he had studied them carefully. In fact, he was influenced by Paracelsian dogmas and this influence becomes obvious into his own matter theory, which can be considered both vitalistic and mechanistic, that means that he followed an eclecticism. His eclecticism was not a consequence of improving and supporting his theory, but he tried to avoid a threat of a rampant sectarianism in order to be acceptable by his colleagues in the *College of Physicians*. He knew that many members of the *Royal Society of London* and *College of Physicians* were anti-Paracelsians and in order to be a part of the "elite" of those scholars, due to which he would have a career, he had to pay close attention on how he defined his views and theory²⁸.

Thereupon, it is perceived that these strident debates between Paracelsians, anti-Paracelsian and crypto-Paracelsians or pseudo-antiParacelsians (*compromisers*)

22 Forshaw J. Peter, "Paradoxes, Absurdities, and Madness" (2008): 74.

23 Chang (Keving) Ku-ming, "Alchemy as Studies of Life and Matter: Reconsidering the Place of Vitalism in Early Modern Chemistry", *ISIS* 102(02) (2011): 325.

24 Forshaw J. Peter, "Paradoxes, Absurdities, and Madness" (2008): 73.

25 Moran T. Bruce, "A Survey of Chemical medicine in the 17th century: Spanning, Court, Classroom and Cultures", *Pharmacy in History* 38(4) (1996): 122.

26 Frietsch Ute, "The Boundaries of Science/ Pseudoscience" (2015), paragraph 13. See also Clericuzio Antonio, "From van Helmont to Boyle"(1993): 309.

27 Harding Tim, "The Transition from Alchemy to Chemistry", *The Skeptic* 39(1), (2019) (available online in: <https://yandoo.wordpress.com/2019/03/06/the-sceptical-chymist-the-transition-from-alchemy-to-chemistry/>).

28 Papanikolaou Elli, "Walter Charleton's Theory of Matter: How Politics and Scientific Societies Influenced his Works", *Athens Journal of History* 6(3) (2020): 294-296.

were the outcome of different causes, many of which were not actually related to Paracelsus's philosophy. Of course the Paracelsian alchemists (or better *alchymists* and *chymists*, as they wanted to call themselves) tried to support their theories against the accusations of other scholars, but many anti-Paracelsians were also alchymists, such as Andreas Libavius, who wanted to promote chymistry as a "science," which has distanced itself from occult philosophy. Of course, these alchymists did not realize that by accusing alchemy as *pseudoscience*, they destroyed themselves by harming their domain and therefore their main goal to promote alchemy as *science*. While, many anti-Paracelsians or pseudo-antiParacelsians accused Paracelsus without having study his works supporting that his theory was "pseudoscience," "heretic" and "revolutionary."

Conclusion

Consequently, through this analysis it has been proved that the main cause of the polemical debates between the Paracelsians, anti-Paracelsians and crypto-Paracelsians or pseudo-antiParacelsians is not, in reality, Paracelsus's philosophy. Paracelsianism triggered these polemical debates, which, in fact, concerned the nature of the scientificity of alchemy. Hence, the true important reasons for these disputes are three; the religious and political factors as well as the academic communities, which started to appear at that period. However, because of the sudden development and spread of Paracelsus's theory, many scholars used Paracelsianism as the primary reason in order to attack alchemy to identify themselves as scientists, or in order to "change" alchemy for making it a more "respectable science." More detailed, the first cause is the political and religious disturbances of the sixteenth and seventeenth century. The alchemists, trying to find patrons and funds or trying to promote their theory, connected Paracelsianism with political ideas. For example, in the periods of Interregnum and Restoration in England Paracelsians' doctrines were used to provide the content of a radical political programme. Accordingly, many anti-Paracelsians criticized Paracelsus as a heretic and rebellious person, who wants to control the people, with the main purpose of promoting themselves as the "right scientists", whom people should trust; and they did this in order to marginalize the Paracelsians and acquire funds.

Furthermore, in the period of *Scientific Revolution* there was a reorganization of universities. During these centuries the universities underwent major changes as new chairs were established and many domains began to emerge. A great example is that, after Galileo's discoveries, the mathematics acquired a different and most important place in universities' corpus, as the mathematics became "science." Therefore, with the founding of Paracelsian iatrochemistry,

the Galenic physicians began to attack on Paracelsians with the main goal of keeping their primacy. Respectively, many alchemists, wanting to "purify" alchemy, in order to include it in the universities' corpus, attacked on the scientificity of the Paracelsians, who in turn retaliated against the accusations trying to support the "superiority" of their chymiatry. Last but not least, the establishment of the *Royal Society of London* and the *College of Physicians* also provoked these polemical debates by influencing their outcome. These foundations identified themselves as "scientific communities" by characterizing other communities *pseudoscientific* and *sectaries*. Thus, from 1650 onwards, the members of these communities labeled Paracelsianism a *sect*. Despite the fact that many *Paracelsians* had connection with members of the *Royal Society* and *College of Physicians*, the members of these communities condemned hermetic philosophy and named Paracelsians as *pseudoscientists*. It is really fascinating that simultaneously with these accusations the members of these communities called important alchemists to present their works in the *Royal Society*. For instance, in 1670 the alchemist Johann Joachim Becher performed an experiment before Elector Johann Philipp in Mainz and this process was so interesting that became known to some members of the *Royal Society of London*, who asked him to present his experiments before them²⁹. Hence, despite the fact that there are many examples where the members of these societies respected specific alchemists and had connection with them or inspired by them, they continued to oppose to alchemy and specifically to Paracelsianism. Probably that is why many alchemists were pseudo-antiParacelsians or crypto-Paracelsians and why many Paracelsians started to promote the terms of *alchymists* or *chymists* in order to re-identify themselves.

These three basic causes provoked intense criticism to Paracelsians, who tried to "save alchemy" as the truly superior *science*. Unfortunately, the severe criticism of the anti-Paracelsians and crypto-Paracelsians or pseudo-antiParacelsians (compromisers) provoked negative thought of Paracelsianism, which was close related with the general term of alchemy. Thus, around 1730s Paracelsianism connected with pseudoscience, and this accusation was not an outcome provoked by Paracelsus's theory but a result of these polemic debates. Although, chrysopoeia was an integral part of chymistry, the anti-alchemical rhetoric inside universities had an augmentation in the late of the seventeenth century. A great example is Herman Boerhaave, who did not mock chemistry's past, but he did find it necessary to apologize for it³⁰. Therefore, in the early of eighteenth century the banishment of Paracelsianism and

29 Smith H. Pamela, *The Business of Alchemy: Science and Culture in the Holy Roman Empire* (Princeton University Press, 1994), 18.

30 Principe M. Lawrence, "Alchemy Restored", *Isis* 102(2) (2011): 305.

chrysopoeia (increasingly called alchemy) contributed to link alchemy to the term *pseudoscience*.

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