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PLANT ALCHEMY, PARACELSIANISM AND INTERNAL SIGNATURE THEORY IN THE WRITINGS OF GUY DE LA BROSSE (1586–1641)

by

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In France, the Jardin des Plantes is one of the oldest surviving scientific institutions, the chief botanical garden and the host of many schools and centres studying the natural sciences. It was established in 1640 as the Royal Garden through the tireless labour of the physician Guy de La Brosse (1586–1641). The present article focuses on La Brosse's views of advancement of plant alchemy as the source of knowledge of plants. It discusses his adoption of the Paracelsian physician Joseph Du Chesne's (Quercetanus, 1546–1609) distinction between external and internal signature theory, opting firmly for the latter as the basis of true knowledge. The internal character, La Brosse argues, can only be revealed empirically, by fire analysis and the practice of distillation, which can also harness the occult properties of plants for human benefit.

Keywords: alchemy; plants; botanical gardens; alchemical laboratories; Paracelsianism; Guy de La Brosse; Jardin des Plantes; Joseph Du Chesne; signature theory; empiricism; distillation

> 'because one cannot find the secrets of nature with crossed arms'
>
> (Guy de La Brosse)[1]

In 1640, the Jardin Royal des Plantes Medicinales (Royal Garden of Medicinal Plants) opened to the Parisian public. It was the crowning moment of a two-decade effort by the physician Guy de La Brosse (1586–1641). A triumphant La Brosse announced it to the world by means of a small pamphlet called *The opening of the Royal Garden of Paris for the demonstration of medicinal plants* (*L'Ouverture de Iardin Royal de Paris, pour la demonstration des plantes medecinales*). In it, La Brosse claimed that the new garden was the greatest in Europe, being the largest, the most varied and the best structured.[2] He described it as an institution of practical education, which would increase and spread the

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1 Guy de La Brosse, *De la nature, vertu et utilité des plantes* (Baragnes, Paris, 1628), livre I, p. 45: 'car les bras croisez l'on ne trouve les secrets de la nature'. The translations from La Brosse are my own.

2 Guy de La Brosse, *L'Ouverture du Iardin Royal de Paris, pour la demonstration des plantes medecinales* (Iacques Dugast, Paris, 1640), pp. 6–8.

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knowledge of plants. Students at the Garden would benefit from two types of 'demonstrations'. The external demonstration would be undertaken in the garden, and here they would learn the appearance, name, origin and general characteristics of the plants found therein.[3] This would be augmented by an internal demonstration, taking place in lecture rooms as well as in the gallery laboratory. Three physicians would teach the 'interior of plants' by means of distillation and alchemy,[4] demonstrating their qualities, faculties, properties and uses.[5] The knowledge acquired by means of alchemy was not a small matter, La Brosse argued, because plants were 'more useful to the human condition than any other products of nature, not only for its livelihood and attire, but also as remedies for its infirmities and instruments for its arts'.[6] In this sense, he saw the Garden as a place where empirical knowledge could be acquired both outside in the garden and inside in the laboratory. For him, the Garden as a whole encompassed the laboratory, as this was where the insensible properties of plants could be made manifest.

The tremendous success of the Jardin Royal, now known as the Jardin des Plantes, has obscured its founder, and there is still limited scholarship on him and his work.[7] This article will investigate La Brosse's positioning of himself as the standard bearer of a specific form of Paracelsian alchemical philosophy, which focused on the study and medical application of plants. I will emphasize La Brosse's debt to a certain brand of Paracelsianism that was advocated by Joseph Du Chesne (also known as Quercetanus; 1546–1609), which itself drew on the work of Petrus Severinus (1540–1602).[8] I will particularly emphasize La Brosse's support for an internal signature theory, which he used to advance his views of plant alchemy.

Guy de La Brosse and his garden

Sometime around 1616, a youthful La Brosse first petitioned King Louis XIII (1601–1643) for the establishment of a large garden in Paris, modelled on the one that already existed

3 *Ibid*., pp. 33–35.

4 *Ibid*., pp. 9, 35–36. I am using alchemy here as an all-encompassing term for what used to be called by various names: alchemy, chemistry, iatrochemistry and variants.

5 *Ibid*., p. 16.

6 *Ibid*., p. 19: 'plus utiles à la condition humaine que tous les autres produits de la Nature, tant pour son vivre & vestir, que pour remedes à ses infirmitez & instrumens à ses Arts'.

7 The only monograph-level treatment of Guy de La Brosse remains Rio Howard, *La bibliothèque et le laboratoire de Guy de La Brosse au Jardin des Plantes à Paris* (Droz, Geneva, 1983). On La Brosse, see also Fabrizio Baldassarri, 'Before vitalism: libertine botany and the non-obscure life of plants', *Scienza e Filosofia* **25**, 218–231 (2021); Natania Meeker and Antonia Szabari, *Radical botany: plants and speculative fiction* (Fordham University Press, New York, 2020), pp. 34–39; Matteo Fornasier, 'I principi epistemologici della botanica di Guy de La Brosse', *Noctua* **7**(2), 225–269 (2020); Didier Kahn, 'Plantes et médecine, (al)chimie et libertinisme chez Guy de La Brosse', *Medic@* (April, 2007), https://www.biusante.parisdescartes.fr/histoire/medica/presentations/brosse.php (accessed 7 July 2022); Rio Howard, 'Guy de La Brosse: botanique et chimie au début de la révolution scientifique', *Rev. Hist. Sci.* **31**(4), 301–326 (1978); Henri Guerlac, 'Guy de La Brosse and the French Paracelsians', in *Science, medicine and society in the Renaissance: essays to honor Walter Pagel*, 2 vols (ed. A. G. Debus), vol. 1, pp. 177–200 (Heinemann, London, 1972). René Pintard has placed La Brosse among the 'erudite libertines' of the early seventeenth century: *Le libertinage érudit dans la première moitié du xviie siècle* (Slatkine, Geneva, 1983, augmented edition), pp. 195–200, 202.

8 On Joseph Du Chesne, see Didier Kahn, *Alchimie et Paracelsisme en France à la fin de la Renaissance (1567–1625)* (Droz, Paris, 2007), pp. 233–278; Didier Kahn, 'L'interprétation alchimique de la Genèse chez Joseph Du Chesne dans le contexte de ses doctrines alchimiques et cosmologiques', in *Scientiae et artes. Die Vermittlung alten und neuen Wissens in Literatur, Kunst und Musik*, 2 vols (ed. Barbara Mahlmann-Bauer), vol. 3, p. 641–692 (Harrassowitz, Wiesbaden, 2004); Hiro Hirai, 'The world spirit and quintessence in the chymical philosophy of Joseph Du Chesne', in *Chymia: science and nature in medieval and early modern Europe* (ed. Miguel López Pérez, Didier Kahn and Mar Rey Bueno), pp. 247–261 (Cambridge Scholars, Newcastle upon Tyne, 2010).

in Montpellier. At this point La Brosse was the physician of the Prince de Condé, but soon he became one of the king's physicians in ordinary, being selected for this position by the First Physician of the King, Jean Héroard (1551–1628).

With Héroard's support, La Brosse obtained Louis XIII's approval for the set-up of a royal garden ten years later, on 6 January 1626. In July of the same year, the Parliament of Paris gave its consent, and in August Héroard passed the responsibility for setting up the garden to La Brosse as its Intendant.

The edict issued by the king was unfortunately vague, approving the establishment and construction of a Royal Garden of Medicinal Plants in one of the fauxbourgs (suburban areas) of Paris. Specifics were lacking, including funds. La Brosse immediately set himself to write letters petitioning support from the Cardinal de Richelieu (1585–1642), as well as from the Guardian of Seals and the Superintendent of Finances. To garner support for his endeavour and to prove his credentials in running the new institution, he also wrote a work called *On the nature, virtue and utility of plants* (*De la nature, vertu et utilité des plantes*, 1628, henceforth called *On the nature of plants*).

By 1633, the energetic physician had managed to ensure the purchase of the land for the Garden. He immediately set to work in coordinating its set-up. The Garden looked functional by 1636, according to an engraving by Frédéric Scalbergé (figure 1).[9] The actual public opening had to wait until 1640, but the concept proved an instant success. By 1641, no fewer than 227 students had attended the demonstrations promised by La Brosse in *L'Ouverture*.[10] That same year, La Brosse died suddenly. After his death, the Garden fell into a state of apparent neglect until 1648, when the Scot William Davisson (1593–1673) was appointed Intendant.

Before reviewing La Brosse's views, it is worth investigating his Paracelsian background in a bit more detail. La Brosse came from an established medical family, with his father, Isaie de Vireneau, Sieur de La Brosse, being a physician at the royal court. The La Brosses originated from the south of France, and it is very likely that they were in the retinue of Henri IV de Bourbon (1553–1610), as he moved to take the crown of France in Paris in 1589. It has been suggested that the family was originally Protestant, but may have converted to Catholicism; in any case, Guy is known to have died in the Catholic faith.[11]

At the turn of the seventeenth century, the physicians of Henri IV formed a powerful faction that supported the new medical philosophy of Theophrastus von Hohenheim, called Paracelsus (1493–1541). The Paracelsian movement customarily rejected the teachings of Galen and Aristotle in favour of a new form of medicine based on empirical experience and the tenets of medical alchemy and astrology. In Paris, their views were countered by the powerful Medical Faculty of the University, a bastion of Galenic teaching, leading to a number of notorious confrontations that resonated throughout Europe.[12]

9 This engraving was included in Guy de La Brosse, *Description du Iardin Royal des plantes medecinales estably par le roi Louis le Juste à Paris, contenant le catalogue des plantes qui y sont de present cultivées, ensemble le plan du Iardin* (Paris, 1636).

10 Guy de La Brosse, *Catalogue des plantes cultivées à present au Iardin Royal des plantes medecinales* ([Jacques Dugast], Paris, 1641), pp. 1–8. On La Brosse's teaching, see Didier Kahn, 'The first private and public courses of chymistry in Paris (and Italy) from Jean Beguin to William Davisson', *Ambix* **68**(2–3), pp. 247–272 (2021) (https://doi.org/10.1080/00026980.2021.1922019), at pp. 265–267.

11 Guerlac, *op. cit.* (note 7), p. 180.

12 On Paracelsianism in France and its confrontations with the Medical Faculty in Paris, see Kahn 2007, *op. cit.* (note 8); Allen Debus, *French Paracelsians* (Cambridge University Press, Cambridge, 1991), pp. 46–65.

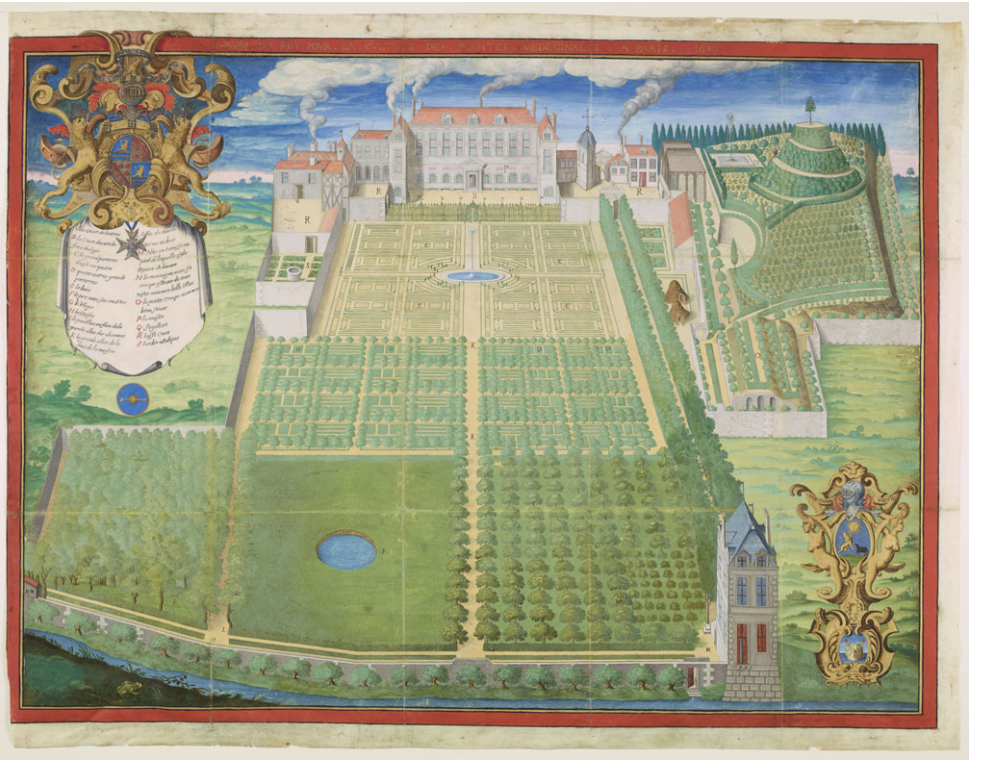

Figure 1. The Jardin du Roy in 1636, according to an engraving by Frédéric Scalbergé. This version on vellum, painted in gouache, survives in the Muséum national d'Histoire naturelle. A black and white version was published in Guy de La Brosse, *Description du Iardin Royal des plantes medecinales estably par le roi Louis le Juste à Paris, contenant le catalogue des plantes qui y sont de present cultivées, ensemble le plan du Iardin* (Paris, 1636). Source: Muséum national d'Histoire naturelle. Public domain.

La Brosse seems to have been associated with the physicians of Henri IV early on in his career; indeed in 1607 he was condemned by the faculty, together with other Paracelsians, for treating patients with alchemical medicine.[13] His later praise for Jean Ribit de la Rivière (1546–1606), the First Physician of Henri IV, suggests that he may have been part of his entourage.[14] Ribit de la Rivière was seconded by the most outspoken of the Paracelsian group, Joseph Du Chesne, a Gascon physician and prolific writer of alchemical treatises. Together with the younger Theodore Turquet de Mayerne (1573–1655), the three built a strong alliance;[15] years later, La Brosse described the Paracelsian medical 'sect' as the most powerful that ever existed.[16]

13 Kahn 2007, *op. cit.* (note 8), p. 389.

14 On Jean Ribit de la Rivière, see Hugh Trevor-Roper, 'The Sieur de la Rivière, Paracelsian physician of Henri IV', in Debus (ed.), *op. cit.* (note 7), vol. 2, pp. 227–250.

15 Hugh Trevor-Roper, *Europe's physician: the various life of Sir Theodore de Mayerne* (Yale University Press, New Haven, 2006).

16 Guy de La Brosse, *Advis defensif du Iardin royal, des plantes medecinales à Paris* (Paris, 1636; first printed in La Brosse, *op. cit.* (note 1), pp. 745–809), p. 33, 'Entre les François, il a esté suiuy de Ioseph du Chesne, d'Harvet, de Baucinet, de Claude Dariot, de Mayerne, & de plusieurs autres encores vivans: & depuis que la Medecine a esté donnée aux hommes, il n'y a point eu de si puissante secte.'

After Henri IV's death, La Brosse continued to be allied with members of the Paracelsian faction who were close to the new king, Louis XIII. He seems to have been acquainted with Jean Beguin (ca 1550–ca 1620), who had been appointed by Du Chesne and Mayerne as the teacher of the first courses of chymistry in France.[17] La Brosse was certainly close to Jean Héroard, who had Paracelsian sympathies as well.

At the beginning of the 1620s, however, the Paracelsian current was facing new challenges, both without and within. An important impact was that of the 1623 Rosicrucian hoax, as Didier Kahn has called it, which prompted a condemnation by the Jesuit Father François Garasse (1585–1631), including an attack on one of La Brosse's friends, the poet Théophile de Viau (1590–1626).[18] The following year Étienne de Clave (1587–1645) parted ways with the Paracelsians by proposing a new philosophy opposed to both Aristotelians and Paracelsians; in response, the Parliament of Paris cast de Clave out of France in 1624.[19] In 1625, the Theological Faculty of the University of Paris condemned Heinrich Khunrath's (ca 1560–1605) alchemical work *The amphitheatre of eternal wisdom* (*Amphitheatrum sapientiae aeternae*).[20]

In the middle of this storm, La Brosse continued to advance the Garden project. Apart from a treatise in support of Viau and another on the plague, he was quiet but efficient.[21] The 1626 approval of the Garden must have stunned the Galenic Medical Faculty, which would spend the following years trying to reverse, delay or appropriate La Brosse's project. What they were most worried about was his plan to teach alchemy at the Garden.[22] In the end, however, they could not stop the intrepid physician.

There were several reasons why La Brosse was so successful. Scholars have highlighted his ability to cultivate friendships in high places. He must have also realized that the advancement of plants was a subject that the supporters of traditional medicine could hardly object to, and in turn used plants as a way of creating a firm base for alchemical teaching in Paris. This is not to say that he saw plants only as a means of establishing Paracelsianism in Paris: as we will see, he actually worked hard to carve a space for the alchemy of plants in the intellectual landscape of the era.

Plant alchemy, distillation and the influence of Joseph Du Chesne

La Brosse was a supporter both of plants and of Paracelsianism, but scholars have not traditionally associated the Paracelsian current with plants and herbalism. This view has now begun to change.[23] Paracelsus himself was interested in plants as well as minerals and animals, employed distillation and wrote a fragmentary *Herbarius*.[24] His thinking about

17 On Jean Beguin's teaching, see Kahn, *op. cit.* (note 10), pp. 249–254.

18 Kahn 2007, *op. cit.* (note 8), pp. 413–499; Didier Kahn, 'The Rosicrucian hoax in France (1623–24)', in *Secrets of nature: astrology and alchemy in early modern Europe* (ed. William R. Newman and Anthony Grafton), pp. 253–344 (MIT Press, Cambridge, MA, 2001).

19 On the affaire of Etienne de Clave and Antoine de Villon, see Kahn 2007, *op. cit.* (note 8), pp. 501–567.

20 On Khunrath's condemnation, see *ibid*., pp. 568–593.

21 Guy de La Brosse, *Traicté de la peste … avec des remedes preservatifs* (Jérémie et Christophe Périer, Paris, 1623); Guy de La Brosse, *Traicté contre la Mesdisance* (Jérémie et Christophe Périer, Paris, 1624).

22 Rio Howard, 'The founding of the Jardin des Plantes in Paris', *J. Western Soc. French Hist.* **2**, 138–150 (1974), at p. 147.

23 For instance, there has been renewed interest in one of the first Paracelsian followers, Leonhard Thurneisser: see Bruce T. Moran, 'Medical performance and the alchemy of plants in the ventures of Leonhard Thurneisser zum Thurn', *Ambix* **69**(2), 95–117 (2022) (https://doi.org/10.1080/00026980.2022.2042058).

24 Matti Leprêtre, 'Paracelsus, his *Herbarius*, and the relevance of medicinal herbs in his medical thought', *Daphnis* **49**(3), 324–378 (2021). As Leprêtre points out, Paracelsus's interest in plants has not been researched as much as that on minerals because of

plants has particularly been tied in with the notion of the doctrine of signatures, present in several of his treatises, some of which may not be authentic.[25] This doctrine has been discussed by many different scholars in the wake of Michel Foucault's highly influential *Les mots et les choses* (1966, translated as *The order of things*, 1973).[26] Paracelsus's support of this concept led to a fashion for the signature theory at the turn of the seventeenth century, exemplified particularly by Oswald Croll (ca 1563–1609), and applied specifically to plants by Johann Popp (fl. 1617–1629).[27] Yet it was Paracelsus's support for mineral medicine, including antimony and mercury, that captured the imagination of physicians, and became most closely associated with his name.

The reason for this is, perhaps, because the notion of distilling plants was much less controversial and had a longer pedigree. Indeed, while we often associate medical alchemy with Paracelsus, in fact it had much older roots. It was linked with the discovery of alcohol by thirteenth-century Salernitan monks, and afterwards with the notion of quintessence as developed by the fourteenth-century Franciscan monk Johannes de Rupescissa (ca 1310 to 1366–70).[28] As such, medical alchemy had strong plant-based roots, and the remarkable spread of distillation techniques in the Renaissance and early modern Europe was chiefly based on plants. In the sixteenth century, plant distillation flourished, prompted by the works of Hieronymus Brunschwig (ca 1450–ca 1512), Philipp Ulstad (fl. 1526–1672) and others.[29] Plant alchemy certainly did not need the genius of Paracelsus to spread, as it had its own theory and practice. Yet many supporters and practitioners of alchemical distillation were interested in the Paracelsian current, as for instance Gerard Dorn (ca 1530–1584) or Conrad Khunrath (1555–1613).[30]

the negative statements made by Paracelsus's chief modern scholar, Karl Sudhoff, as well as by the specialist in early modern herbalism Agnes Arber. See Karl Sudhoff, *Versuch einer Kritik der Echtheit der Paracelsischen Schriften*, 2 vols (Georg Reimer, Berlin, 1894–1899), vol. 2 (*Paracelsische Handschriften*), esp. p. vii; Agnes Arber, *Herbals, their origin and evolution: a chapter in the history of botany, 1470–1670* (Cambridge University Press, Cambridge, 1912), esp. p. 205.

25 The authorship of the highly influential 'De signatura rerum naturalium', a treatise included in *De natura rerum*, has been disputed. On the topic, see Urs Leo Gantenbein, 'Real or fake? New light on the Paracelsian *De natura rerum*', *Ambix* **67**(1), 4–29 (2020) (https://doi.org/10.1080/00026980.2020.1720339), at pp. 25–28.

26 Michel Foucault, *Les mots et les choses* (Gallimard, Paris, 1966), translated as *The order of things: an archaeology of the human sciences* (Vintage, New York, 1973), defined the doctrine of signatures as fundamental to the Renaissance worldview. His controversial view had a lasting impact on the subject. See, for instance, Massimo Luigi Bianchi, *Signatura rerum. Segni, magia e conoscenza, da Paracelso a Leibniz* (Edizioni dell'Ateneo, Rome, 1987); Wolf-Dieter Müller-Jahncke, 'Ordnung durch Signatur: Analogiedenken und Arzneischatz im 16. und 17. Jahrhundert', *Deutsche Apotheker Zeitung* **124**, 2184–2189 (1984); Wilhelm Kühlmann, 'Oswald Crollius und seine Signaturenlehre: zum Profil hermetischer Naturphilosophie in der Ära Rudolphs II', in *Die okkulten Wissenschaften in der Renaissance* (ed. A. Buck), pp. 103–123 (Harrassowitz, Wiesbaden, 1992); James J. Bono, *The word of God and the languages of man* (University of Wisconsin Press, Madison, 1995), pp. 123–166; Bradley C. Bennett, 'Doctrine of signatures: an explanation of medicinal plant discovery or dissemination of knowledge?', *Econ. Bot.* **61**, 246–255 (2007); Giorgio Agamben, *Signatura rerum. Sul metodo* (Boringhieri, Turin, 2008); and, most recently, Yohei Kikuchihara and Hiro Hirai, 'Signatura rerum theory', in *Encyclopedia of Renaissance philosophy* (ed. Marco Sgarbi) (Springer International Publishing, Cham, 2014), https://doi.org/10.1007/978-3-319-02848-4_405-1.

27 Oswaldus Crollius, *De signaturis internis rerum. Die lateinische Editio princeps (1609) und die deutsche Erstübersetzung (1623)* (ed. Wilhelm Kühlmann and Joachim Telle) (Franz Steiner, Stuttgart, 1996). Johann Popp's work was published in German: *KräuterBuch. Darinnen die Kräuter des Teutschen Landes, aus dem Licht der Natur, noch rechter art der Signaturen der Himlischen Einfliessung nicht allein beschrieben* (Zachariae Schürers und Matthiae Götzen, Leipzig, 1625).

28 On Rupescissa, see Leah DeVun, *Prophecy, alchemy, and the end of time: John of Rupescissa in the late Middle Ages* (Columbia University Press, New York, 2009).

29 A general introduction is provided by the somewhat outdated works of R. J. Forbes, *A short history of the art of distillation* (Brill, Leiden, 1948); and Robert Multhauf, 'The significance of distillation in Renaissance medical chemistry', *Br. Hist. Med.* **30**, 329–346 (1956).

30 On Gerard Dorn, see Jean-Francois Marquet, 'Philosophie et alchimie chez Gerhard Dorn', in *Alchimie et philosophie à la Renaissance* (ed. J.-C. Margolin and S. Matton), pp. 215–221 (Vrin, Paris, 1993); and Didier Kahn, 'Les débuts de Gérard Dorn

The controversy surrounding the use of minerals, and particularly antimony, had the effect of overshadowing the plant side of Paracelsian alchemy. In France, for instance, Paracelsianism was associated, rightly or wrongly, with antimony-based cures, leading to the famous *querrelles de l'antimoine*.[31]

Yet several of the French Paracelsians were also interested in plants. Du Chesne, in particular, had a keen interest in plants and plant distillation. In 1603 he published a compendium called *De priscorum philosophorum verae medicinae materia* (*The matter of the true medicine of the ancient philosophers*), a work that drew the ire of the Paris Medical Faculty for its main contention, which was that the followers of Paracelsian alchemy (*spagyria*) were the heirs of an ancient 'Hermetic' school of medicine.[32] Plants figure prominently in this publication, and Du Chesne argued that an universal medicine can be extracted from plants—more specifically from wine.[33] *De priscorum philosophorum* also includes a treatise called *De dogmaticorum medicorum legitima et restituta medicamentorum praeparatione* (*The legitimate and restored preparation of the medicines of dogmatic physicians*). In it, Du Chesne argued that dogmatic medicine—by which he denoted Hippocratic and Galenic medicine—could be improved by using alchemical methods, more specifically distillation. Most of the recipes given therein refer to plants. Du Chesne's approach was to suggest that alchemy improved, rather than rejected, the medicine of Hippocrates and Galen, and that they themselves would have been pleased to see the progress of medicine in the early modern period.[34]

Du Chesne's work was poorly received by the Paris faculty, which issued an edict condemning it, followed up by several pamphlets, interdictions and even requisitions of alchemical remedies. As already mentioned, La Brosse was caught in the fray. In 1607, King Henri IV himself had to intervene to appease the conflict and ensure that Du Chesne and Turquet de Mayerne could continue practising medicine in Paris.[35] During the same year, Du Chesne published a full pharmacopoeia called *Dogmaticorum pharmacopoeia restituta* (*The restored pharmacopoeia of the dogmatics*); it was apparently simultaneously published in Frankfurt, Leipzig and Giessen.[36] This is a much-augmented version of the 1603 publication and follows the same principles, supposedly improving on the recipes of

d'après le manuscrit autographe de sa *Clavis totius philosophiæ chymisticæ* (1565)', in *Analecta Paracelsica* (ed. Joachim Telle), pp. 59–126 (Franz Steiner, Stuttgart, 1994). On Conrad Khunrath, the older brother of the more famous alchemist Heinrich Khunrath, and author of a rather popular work on distillation, *Medulla destillatoria* (1594), see Oliver Humberg, *Der Alchemist Conrad Khunrath. Texte und Dokumente aus Leipzig, Schleswig und Hamburg mit Studien zu Leben, Werk und Familiengeschichte* (Humberg, Wuppertal, 2006).

31 On this topic, see Kahn 2007, *op. cit.* (note 8), pp. 171–189.

32 Du Chesne identified four sects of physicians, rather than the customary three, which could be traced back to antiquity: dogmatics, empirics, methodists and Hermetists; Joseph Du Chesne (Quercetanus), *De priscorum philosophorum verae medicinae materia, preparationis modo, atque in curandis morbis, praestantia* (S. Gervasii, Geneva, 1603). On the full contents of this work and the faculty's reaction, see Kahn 2007, *op. cit.* (note 8), pp. 363–373.

33 Kahn 2004, *op. cit.* (note 8), p. 663, Hirai, *op. cit.* (note 8). The view of Du Chesne is clearly influenced by Rupescissa and the Pseudo-Lullian corpus, which adopted Rupescissa's theory of the quintessence. On the promotion of herbal remedies, as well as the introduction of notions of 'vegetation' in pseudo-Lullian alchemy, see Michela Pereira, 'Vegetare seu transmutare: the vegetable soul and pseudo-Lullian alchemy', in *Arbor Scientiae. Der Baum des Wissens von Ramon Llull* (ed. F. Dominguez Reboiras, P. Villalba-Varneda and P. Walter), pp. 93–119 (Brepols, Turnhout, 2002).

34 Joseph Du Chesne, *De dogmaticorum medicorum legitima et restituta medicamentorum praeparatione*, in Du Chesne, *op. cit.* (note 32), pp. 166–167: 'Sanè si vel Hippocrates, vel ipse etiam Galenus nunc reviviscant, summo gaudio utique perfundantur, si videant artem tanto, & tam nobili accessorio ditatam, & manus porrigant, & herbam vel ultrò, pro omnibus iis, quibus ars hodiè ampliata.'

35 Kahn 2007, *op. cit.* (note 8), pp. 389–391.

36 Joseph Du Chesne, *Dogmaticorum pharmacopoeia restituta* (Johannes Theobald Schönwetter, Frankfurt, Thomas Schurer and Bartholomaeus Voigt, Leipzig, and Nicolaus Hampelius, Giessen, 1607).

the ancient dogmatics. Du Chesne continues to claim the superiority of medicine obtained by the distillatory technique and implicitly posits the supremacy of the alchemical physicians over traditional Galenists. Rather tellingly, the Frankfurt edition features a frontispiece that places Hippocrates and Hermes at the top, with Galen and Aristotle below them.

La Brosse, who undoubtedly knew Du Chesne, followed in his footsteps with a keen interest in plant-based medicine and an attempt to legitimize Paracelsian alchemy. In the *Advis defensif du Iardin Royal* (*A defensive notice on the Royal Garden*), which was written before 1626 to advance his project, La Brosse makes his own attempt to legitimize the Paracelsian faction. However, he shelves Du Chesne's theory that Paracelsians are an ancient 'Hermetic' sect; his own history of medicine accepts the traditional account of three ancient sects. Instead, he maintains that the Paracelsian faction is new, but attempts to show that it is not radically different from the 'dogmatic' or 'rational' sect of Hippocrates and Galen. La Brosse adopts Du Chesne's strategy of not attacking Galen; instead, he aims to rhetorically pit the ancient physician against his early modern followers. He argues that the latter prefer to know medicine by books and the opinion of others, and think that medicine does not require working with one's hands, something Galen disagreed with.[37] In fact, La Brosse goes further, claiming that these physicians do not belong to Galen's dogmatic sect at all. Instead, he maintains that they have joined a new sect which he derisively calls 'sanguinaire', 'the bleeder sect'. They are not following Galen, but a certain Botal who had proclaimed bleeding as the panacea for all diseases.[38] It is doubtful that there was such a 'bleeder sect', but the butt of La Brosse's attack must have been Galenic supporters of phlebotomy such as Guy Patin (1601–1672), professor of the Medical Faculty at the University of Paris.[39] Patin incidentally delivered a crass epitaph upon La Brosse's sudden death, maintaining that 'the devil will bleed him in the other world as befits a swindler, atheist, imposter, murderer and public butcher'.[40]

La Brosse's internal signature theory in *On the nature of plants* (1628)

Interestingly, by the time La Brosse wrote *On the nature of plants*, his attitude towards Galen had hardened, and his Paracelsian allegiance is much more explicit than in *Advis defensif*. The opposition of the Medical Faculty may have played a role in this. The cover of *On the nature of plants* places Paracelsus alongside three ancient authorities: Hippocrates, Dioscorides and Theophrastus (figure 2). Hippocrates was, of course, the chief medical authority, but he was also a figure who had been described by certain Paracelsians as a kind of proto-alchemist.[41]

37 La Brosse, *op. cit.* (note 16), p. 4.

38 *Ibid*., pp. 27–28. La Brosse is referring here to the Italian surgeon and anatomist Leonardo Botallo (ca 1530–ca 1587), who was employed at the court of Charles IX in France and was indeed a well-known supporter of phlebotomy. There is very little research on Botallo; for an introduction, see Sven-Goran Fransson, 'The Botallo Mystery', *Clin. Cardiol.* **22**, 434–436 (1999); and Egisto Taccari, 'Botallo, Leonardo', in *Dizionario biografico degli italiani*, vol. 13 (1971), https://www.treccani.it/enciclopedia/leonardo-botallo_%28Dizionario-Biografico%29/ (accessed 10 July 2023).

39 Guy Patin does cite Botallo approvingly: see 'À Hugues II de Salins, le 15 novembre 1657', in *Correspondance complète et autres écrits de Guy Patin* (ed. Loïc Capron) (Bibliothèque interuniversitaire de santé, Paris, 2018), https://www.biusante.parisdescartes.fr/patin/?do=pg&let=0503 (accessed 17 March 2023).

40 I am using Howard's translation here (Howard, *op. cit.* (note 22), p. 138), Guy Patin, 'À Claude II Belin, le 4 septembre 1641), in Patin, *op. cit.* (note 39), https://www.biusante.parisdescartes.fr/patin/?do=pg&let=0060 (accessed 17 March 2023).

41 On the Paracelsian tradition of an alchemical Hippocrates, see Jole Shackelford, 'The chemical Hippocrates: Paracelsian and Hippocratic theory in Petrus Severinus' medical philosophy', in *Reinventing Hippocrates* (ed. David Cantor), pp. 59–88 (Ashgate, Aldershot, 2002); Georgiana D. Hedesan, 'From interpretation to integration: Van Helmont and his medical-alchemical

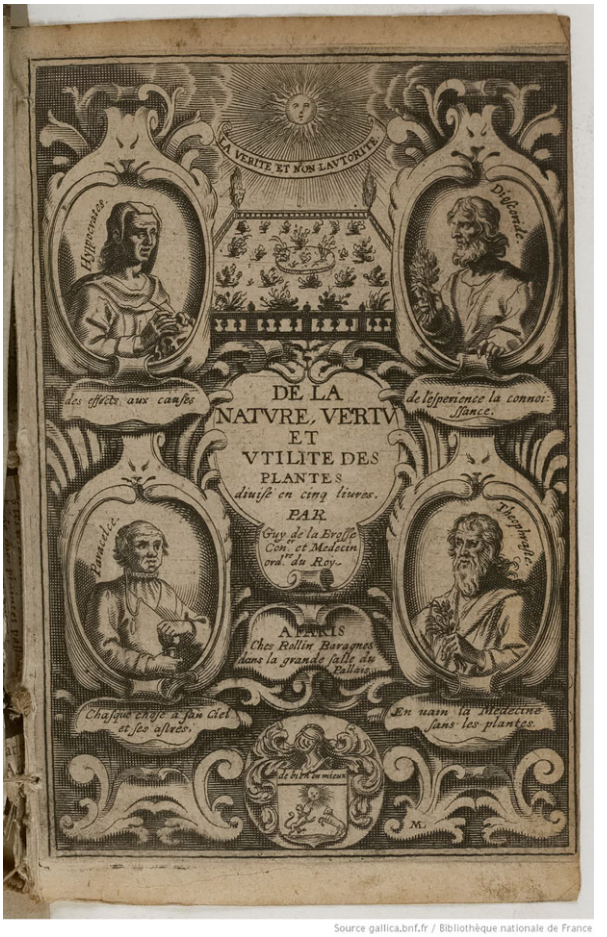

Figure 2. Frontispiece of Guy de La Brosse, *De la nature, vertu et utilité des plantes* (Paris, Baragnes, 1628). Source: gallica.bnf.fr (Bibliothèque nationale de France). Public domain.

For La Brosse, setting Hippocrates and Paracelsus on the same side of the frontispiece must have made sense. Dioscorides was, of course, revered as an empiricist for his highly influential *Materia medica*. Theophrastus had been discovered only in the Renaissance, as the author of the Aristotelian *De causis plantarum* (*On the cause of plants*) and *Historia plantarum* (*The history of plants*), the latter of which has often been described as the first herbal. By setting these two botanical authorities alongside Hippocrates and Paracelsus, La Brosse meant to put together plants, medicine and alchemy. Conspicuously absent from this frontispiece are both Galen and Aristotle.[42]

Hippocratism', in *Alchemy and medicine from antiquity to the Enlightenment* (ed. Jennifer M. Rampling and Peter M. Jones) (Routledge, London, in press).

42 During the Middle Ages, Aristotle was thought of as the author of *De plantis*; however, Julius C. Scaliger proved that he was not its true author. See Fabrizio Baldassari, 'Early modern philosophy of plants and the unwelcome guest: pseudo-Aristotle's *De*

It is Galen's authority that fares the worst in this book. La Brosse chastises the ancient physician for his doctrine of qualities, which cannot explain the virtues of plants.[43] The French physician claims that it is not sufficient to experience a plant by the senses alone; they can only see the surface of things and the 'accidents' (the superfluous changes).[44] He hence dismisses Galen's claim that he could know the properties of things by taste, smell and touch.[45]

This criticism of Galen should be read as part of La Brosse's wider programme of rejecting the use of the unaided senses as a source of true knowledge, deeming them inadequate. This view is particularly familiar to us in relation to the Augustinian and Protestant rhetoric of the Fall of Adam, which is especially poignant in the work of Francis Bacon (1561–1626).[46] However, La Brosse's theology is comparatively understated; for one, he was, at least overtly, a Catholic. Moreover, the line he follows is that of a Paracelsian tradition elaborated by Du Chesne and Severinus, both of them Protestants, but not vehemently so, especially in comparison to Oswald Croll's outspoken 'Calvinist Paracelsianism'.[47]

Instead, La Brosse frames his criticism in terms of Paracelsian doctrine, and specifically that elaborated by Du Chesne. The target, beyond Galen, is the contemporary vogue for the theory of signatures. I noted above how popular this approach had become among certain Paracelsian alchemists.[48] Yet La Brosse is unconvinced by a simple correspondence between outward signature and inner character.

A distinction between the 'external' and 'internal' signatures of things was outlined by Du Chesne, whose understanding of the doctrine of signatures has not yet been made the object of a close scholarly analysis.[49] Du Chesne included a dual treatise on the signature of things in his compendium *De priscorum philosophorum*. In 'The treatise on the external signatures of simples' (*De simplicium signaturis externis tractatus*), he explains that this method involved mainly visual examination, or 'the estimation of the occult property of plants … by similarity of its form and figure'.[50] He points out that alchemical authorities like George Ripley (ca 1415–1490), Isaac Hollandus and Paracelsus had written on the subject. Yet Du Chesne is ambivalent about the value of this approach. In 'The treatise on internal or specific signatures' (*De signaturis rerum internis seu specificis*), he maintains that it is the 'empirical' and 'dogmatic' sects of medicine that were mainly interested in external signatures.[51] He, in contrast, deems visual signs, as well as those revealed by taste and

plantis', in *Περὶ φυτῶν: Greek botanical treatises in the West and the East* (ed. Maria Fernanda Ferrini and Guido Giglioni), pp. 237–264 (Edizioni Università di Macerata, Macerata, 2020).

43 La Brosse, *op. cit.* (note 1), livre II, p. 261.

44 *Ibid*., p. 262.

45 *Ibid*.

46 On this see Peter Harrison, *The fall of man and the foundations of science* (Cambridge University Press, Cambridge, 2007).

47 This title has influentially been used by Owen Hannaway, *The chemists and the word* (Johns Hopkins University Press, Baltimore, MA, 1975), p. 47, and supported by Bono, *op. cit.* (note 26), pp. 140–166. Hiro Hirai has argued that Severinus was not as enticed by biblical themes as Paracelsus was: Hiro Hirai, *Le concept de semence dans les théories de la matière à la Renaissance, de Marsile Ficin à Pierre Gassendi* (Brepols, Turnhout, 2005), p. 242. Du Chesne embraced an alchemical view of Genesis that drew inspiration not only from Paracelsus but also from Augustinian thought, but he was always keen to take a reconciliatory tone and, like Severinus, dressed his Paracelsianism in humanist tropes.

48 I will outline the problem of signature theory at the turn of the seventeenth century in a future article on the subject.

49 For Du Chesne's matter theory in general, see Hirai, *op. cit.* (note 47), pp. 267–294.

50 Joseph Du Chesne, *De simplicium signaturis externis tractatus*, in Du Chesne, *op. cit.* (note 32), pp. 70–88, at p. 75: 'Quid impedit igitur quo minùs concludamus occultas plantarum proprietates aestimare, ac iudicari ut plurimùm signaturis, hoc est, ex similitudine formae atque figurae, cum animalium, tum inanimatorum?'

51 Joseph Du Chesne, *De signaturis rerum internis seu specificis*, in Du Chesne, *op. cit.* (note 32), pp. 89–130, at p. 89. Du Chesne probably influenced Oswald Croll, who corresponded with Du Chesne and used the similar language of 'internal signatures', though this needs to be further substantiated.

smell, to be 'accidental' to the real essence of things. By comparison, the 'Hermetic philosophers' sought the virtues of things more deeply, and found them in three substances: the Paracelsian *tria prima* of salt, sulphur and mercury.[52]

La Brosse draws on Du Chesne's views but is highly critical of the external signature theory. His target is chiefly Giovanni Battista della Porta (1535–1615) and his work on the physiognomy of plants (*Phytognomonica*, 1588). Yet his criticism includes Oswald Croll's work on the signature of simples, in spite of the fact that the latter does distinguish between internal and external signatures.[53] Paradoxically, La Brosse ends his tirade with a qualification: he will not deny the art completely, but argue that it is not reliable and it exaggerates its own epistemological value to the point of ridicule.[54] As I will point out below, sense examination does remain an important part of his empirical approach.

Nevertheless, La Brosse chiefly supports Du Chesne's internal signature theory, which he seeks to distinguish from other similar views of an 'internal character'. As he claims, this does not originate from the heavens or the elements.[55] In other words, he attacks both astrological theories of planetary influence and also the Aristotelian four-element doctrine.[56] Instead, each plant has its own specific character, which he also calls the internal form. He assimilates this with an active agent he usually calls 'Artisan' or 'working spirit' (*esprit ouvrier*).[57] This is how La Brosse describes it:

> It is a living substance, giving strength, movement and virtue to the body that it animates; it is what we call a working spirit, which works in the matter that it disposes and acts according to its natural predestination to cause its sensible action, & shows that it is the immediate principle of life, giving plants their size, conformation, figure, similitude, odours, taste and colours, the qualities of hot, cold, dry and moist, together with the specific and efficient virtues, be it in purgation, in poison, in its contrary and in others without number.[58]

The notion of a 'working spirit' originates from the 'mechanical spirit' (*spiritus mechanicus*) of Petrus Severinus, who, based on his reading of Paracelsus, advocated the dominant role of this spirit in the formation, growth and life of living beings.[59] La Brosse also frames the spirit

52 *Ibid*., p. 90.

53 La Brosse, *op. cit.* (note 1), livre III, p. 411: 'Car après avoir combattu l'Art signe de Crollius, de Milius, & de ceux desemblable farine par bonnes raisons'; livre V, p. 558.

54 *Ibid*., livre III, p. 411: 'Ce n'est pas que ie la nie absolument, seulement diray-je avec douceur qu'elle n'est pas conneue au poinct qu'ils se la proposent, & n'en ont donné d'assez bons preceptes pour s'y amuser solidement.'

55 *Ibid*., livre II, pp. 203–243.

56 La Brosse was here attacking the astrological view that the character of a being was bestowed by the stars. In his era, this view was upheld by Johannes Kepler in his *Tertius interveniens. Das ist, Warnung an etliche Theologos, Medicos vnd Philosophos, sonderlich Philippum Feselium* (Tambach, Frankfurt, 1610). It is unclear whether La Brosse knew of this work, but he seemed familiar with the debate.

57 La Brosse, *op. cit.* (note 1), livre I, pp. 28, 105; livre II, p. 251.

58 *Ibid*., livre II, pp. 250–251: 'Qu'elle est une vive substance, donnant vigueur, mouuement & vertu au corps qu'elle anime, c'est ce que nous nommons esprit Ouvrier, lequel travaille en la matiere qu'il dispose & agence selon sa predestination naturelle pour produire son action sensible, & monstre qu'il est le prochain principe de la vie, donnant aux Plantes les grandeurs, conformations, figures, ressemblances, les odeurs, les saveurs & couleurs, & les qualitez du chaud, du froid, du sec & de l'humide, avec les vertus specifiques efficaces, soit en la purgation, au venin, en son contraire & autres sans nombre.'

59 On the *spiritus mechanicus* in Petrus Severinus, see Hirai, *op. cit.* (note 47), pp. 257–259. Severinus similarly attributed to the *spiritus* 'the body, colours, qualities, size, figures and other signatures conforming to the functions and predestinations of these spirits': *Idea medicinae philosophicae* (Henricpetri, Basel, 1571), p. 96. La Brosse, *op. cit.* (note 1), livre II, p. 223, mentions Severinus, approving of his doctrine of seeds, but criticizing him for leaving room for heavenly agency as well; he also states elsewhere that Severinus knew Paracelsus better than he knew himself (!): *ibid*., livre III, 'Argument', unpaginated. On Petrus Severinus and his ideas, see also Jole Shackelford, *A philosophical path for Paracelsian medicine: the ideas, intellectual context, and*

as an 'earthly star' (*Astre terrestre*), connecting it with Paracelsus's theory of the inner *astra* of the bodies, which is also mentioned on the cover of the work.[60] Furthermore, he associates the Artisan with the notion of form, which was particularly employed by Du Chesne and described as being wholly spiritual.[61]

The juxtaposition of Severinus's spirit with Du Chesne's form seems intentional, and leads La Brosse to the view that the spirit, form and soul are one and the same thing.[62] The equivalence between form and soul was postulated by Du Chesne,[63] but La Brosse extends that to spirit and soul.[64] It leads him to some stark conclusions on the nature of the soul—at least with regard to plants.

Carefully leaving aside the issue of the human soul, La Brosse denies Aristotle's division between the sensitive and vegetative souls, affirming that vegetation and sensation are faculties of the soul rather than souls in themselves.[65] He affirms that there is no fundamental difference between the souls of plants and those of animals. Plants also have sensation, he claims, thus subscribing to the doctrine of universal sensation propounded by Tommaso Campanella (1568–1639).[66] To this he adds that plants experience emotion, giving the examples of a 'sad tree' and a mimosa described in a treatise by Cristóvão da Costa (1515–1594).[67] La Brosse was so enthralled by the mimosa that he procured a sample; indeed, in *L'Ouverture*, he claims to have been the first to grow this 'little sensitive plant' in France.[68] He placed it in the Royal Garden as a centrepiece of his philosophical theory of the nature of plants.

More controversially, La Brosse argued that the soul of a plant survives the death of the plant body itself. According to him, the plant soul is immortal in the sense that it lasts as long as the world itself endures.[69] He further claims that the death of plants is nothing other than the cessation of the actions of the soul or spirit, which 'returns in the universal

influence of Petrus Severinus, 1540–1602 (Museum Tusculanum Press, Copenhagen, 2004); and Ole P. Grell, 'The acceptable face of Paracelsianism: the legacy of *idea medicinae* and the introduction of Paracelsianism in early modern Denmark', in *Paracelsus: the man and his reputation, his ideas and their transformation* (ed. Ole P. Grell), pp. 245–269 (Brill, Leiden, 1998).

60 On the *astra* in the human body for Paracelsus, see Walter Pagel, *Paracelsus: an introduction to philosophical medicine in the era of the Renaissance* (S. Karger, Basel, 1958), pp. 65–72.

61 La Brosse, *op. cit.* (note 1), livre I, p. 28; livre II, p. 250; Joseph Du Chesne, *Ad veritatem Hermeticae medicinae ex Hippocratis veterumque decretis ac Therapeusi* (Abraham Saugrain, Lyon, 1604), p. 155: 'Forma, quae tota spiritualis est, suos motos omnes habet spirituales.'

62 La Brosse, *op. cit.* (note 1), livre I, pp. 43–44: 'Les ames sont les formes, & les formes sont les essences des choses lesquelles ne perissent pas'; livre I, p. 151: 'des actions de l'ame ou de l'esprit ouvrier'. On alchemists' conflation of form, spirit, seeds and sometimes soul, see Norma Emerton, *The scientific interpretation of form* (Cornell University Press, Ithaca, 1984), pp. 177–208.

63 Du Chesne, *op. cit.* (note 61), p. 155.

64 Paracelsians usually associated the *tria prima* with the triad of soul–spirit–body; see, for instance, *ibid*., p. 167. However, as Alain Mothu has noted, the notion of spirit was highly ambiguous in the seventeenth century and could be associated with that of soul, leading to possible materialistic conclusions: *La pensée en cornue. Materialisme, alchimie et savoirs secrets à l'age classique* (SEHA-Arché, Paris and Milan, 2012), esp. pp. 16–27.

65 La Brosse, *op. cit.* (note 1), livre I, p. 19.

66 Tommaso Campanella, *De sensu rerum et magia* (Egenolphus Emmelius, Frankfurt, 1620); livre I, pp. 10–11.

67 Cristóvão da Costa, *Tractado de las drogas y medicinas de Las Indias orientales* (Burgos, 1578), pp. 220–224, 241–242; on this see Baldassarri, *op. cit.* (note 7), p. 227, and Guido Giglioni, 'Touch me not: sense and sensibility in early modern botany', *Early Sci. Med.* **23**(5–6), 420–443 (2018).

68 La Brosse, *op. cit.* (note 2), 19. The mimosa caused a small sensation in France at the time, and Mersenne discussed it with both Descartes and Theodore Haack. On this topic, see Fabrizio Baldassari, 'The mechanical life of plants', *Br. J. Hist. Sci.* **52**(1), 41–63 (2019), at pp. 44–45.

69 La Brosse, *op. cit.* (note 1), livre I, p. 46: 'que les ames des Plantes estoient immortelles de la duree du monde'. La Brosse (livre I, p. 43), carefully distinguishes between a divine duration, which is equivalent with immortality, and a worldly duration, which lasts as long as the world does. According to him, 'religion teaches us and makes us hope' for the former ('celle que la religion nous enseigne & nous fait esperer').

matrices of this globe'.[70] This peculiar doctrine seems to justify the survival of perennial plants beyond their apparent death, but it is nevertheless striking in that it seems to posit the continued existence of individual plants for thousands of years.

This idea seems to have originated from La Brosse's specific reading of Du Chesne and Severinus. Firstly, he mentions two experiments of plant resuscitation (palingenesis) originating in Du Chesne's *Ad veritatem Hermeticae medicinae* (*On the truth of Hermetic medicine*, 1604). The Gascon physician argued that a plant can be reduced to ashes, and then its 'form' can be recovered by alchemical means in a transparent vial. Given Du Chesne's equivalence of form and soul, La Brosse could logically draw the conclusion that the soul remains within matter even after the death of a body. Du Chesne's main purpose in recounting this seems to have been religious (that is, to prove the possibility of the resurrection of the human body after the Second Coming), but La Brosse was not really interested in discoursing on the immortality of the human soul. Placing the soul in matter could lead to accusations of materializing conceptions of the soul, as Didier Kahn pointed out.[71] Perhaps sensing this possibility, La Brosse pre-empts an attack by claiming that his views of plant immortality are 'most conforming with what we are taught in the Holy Scriptures'.[72]

The source of La Brosse's odd view of the plant soul must be sought beyond Du Chesne in Severinus. Severinus drew inspiration from Hippocrates' treatise *Regimen I* (or *De diaeta*) to affirm that existing beings do not actually die, but 'grow' or 'diminish' out of a matrix called 'Orcus' or 'night'.[73] In this decidedly non-Aristotelian view of generation and corruption, Severinus seems to perceive Orcus as a reservoir of existence, where beings come in and out of life in a circular fashion, emerging to 'light' and life and subsequently succumbing to 'darkness' or death.[74] La Brosse seems to apply this view specifically to plants, claiming

> that the souls of Plants are immortal for the duration of the world and that, ceasing to vegetate once they have accomplished the term of their duration, they retire after such fatigue inside their night to rest and to return therefrom to life in the long course of time.[75]

For those in doubt of the fundamentally Hippocratic source of the concept, La Brosse makes a direct reference to *Regimen I* on the view that whatever exists does not perish.[76]

Commenting on this idea in Severinus, Jole Shackelford has argued that Severinus did not actually mean to defend metempsychosis.[77] Yet this is precisely what La Brosse seems to be suggesting, although only with regard to plants. The working spirit, who never truly dies but falls asleep inside matter, returns to life in the course of time: 'This Artisan is not however

70 *Ibid*., livre I, p. 151.

71 Kahn, *op. cit.* (note 7), has called his views 'matérialisme à demi-mot'. See also Mothu, *op. cit.* (note 64).

72 La Brosse, *op. cit.* (note 1), livre I, p. 46: 'Ceste pensée … est la plus conforme à ce que nous en enseignent les sainctes lettres.'

73 Severinus, *op. cit.* (note 59), pp. 87–89, based on Hippocrates, *Regimen* 1.4–5: 'So of all things nothing perishes, and nothing comes into being that did not exist before. Things change merely by mingling and being separated … But all things increase and diminish to the greatest possible maximum or the least possible minimum'; *Hippocrates*, vol. 4 (ed. and trans. W. H. S. Jones) (Heinemann, London, 1967), pp. 223–297, at p. 235.

74 On this theory, see also Shackelford, *op. cit.* (note 41), p. 74. Du Chesne also advanced a similar theory, heavily inspired by Severinus; see Hirai, *op. cit.* (note 47), pp. 279–280.

75 La Brosse, *op. cit.* (note 1), livre I, p. 46: 'que les ames des Plantes estoient immortelles de la duree du monde; & que cessans de vegeter qu'elles avoient accomply le terme de leur duree: qu'elles se retirent après telle fatigue dedans leur nuict pour se reposer, & pour retourner derechef à long progrès de temps en la vie'.

76 *Ibid*., livre I, p. 118.

77 Shackelford, *op. cit.* (note 41), p. 74.

lost; Nature is too curiously obliged to this principle of life, it [Nature] retires it and conserves in itself until the time of its predestination, when it is made to reappear.'[78] La Brosse's Artisan lies in the seed, as it did for Severinus. Yet where Severinus saw seeds as 'invisible', La Brosse has a mundane view of them as equivalent to the visible seeds of plants. He posits that a plant seed contains three parts: the Mother-germ, the germ and the Artisan. The 'Mother-germ' is the main and visible body of the seed. The germ is 'a small body almost imperceptible to our senses, ordinarily situated at the extremity of the grain'.[79] In turn, the Artisan itself is invisible, being finer than the germ.

La Brosse's advancement of plant alchemy

La Brosse's interest in the internal character of plants, which can equally be understood as the Artisan spirit, the form and the soul, leads to the question of how true knowledge of plants can be achieved. As already noted, he had rejected the external signature theory, which posited a link between the external appearance of a simple and its essence.

His criticism, however, did not go all the way, and seems more polemical than substantial. In practice, he appealed to the visible behaviour of plants to justify his theory of plant sensation. His view becomes even more nuanced in a later publication, the *Catalogue of plants cultivated at present in the Royal Garden of Medicinal Plants* (1641), where he states that 'one must know these subjects [plants] by vision, before the hand sets itself to their application'.[80] Clearly, he intends to promote visual examination of plants, as evident in the 'external demonstration' he gave to students in the Royal Garden. Furthermore, La Brosse embarked on a project of creating a visual catalogue of plants, which only survives as an uncompleted draft.[81]

This interest in the appearance of plants is mitigated by his belief that true knowledge lies in penetrating beyond external qualities, to the internal signature and character of a plant. This can only be known by means of the fire and distillation.[82] The fire, as an agent, and distillation, as a process, achieve a true 'anatomy' of plants in the Paracelsian sense, and are essential, La Brosse argues, in making the occult properties of plants manifest and sensible.[83] He describes fire as an 'Artisan' in accordance with the Paracelsian tradition.[84] Book III of *On the nature of plants* is wholly dedicated to alchemy, which, La Brosse

78 La Brosse, *op. cit.* (note 1), livre I, p. 153: 'Cet Artisan pour cela ne se perd, la Nature est trop curieusement obligee a ce principe de la vie, elle le retire & conserve en son sein iusques au temps de sa predestination, qu'elle le doit faire reparoistre.'

79 *Ibid*., livre I, p. 105: 'ce germe est un petit corps presque imperceptible à nos sens, ordinairement situé à l'extrémité du grain'.

80 Guy de La Brosse, *Catalogue des plantes cultivées à présent au Jardin royal des plantes médicinales* (Paris, 1641), 'To the reader'.

81 On La Brosse's sponsoring of this activity, see Fornasier, *op. cit.* (note 7), pp. 248–253.

82 On the importance of fire analysis in the period, see Allen Debus, 'Fire analysis and the elements in the sixteenth and seventeenth centuries', *Ann. Sci.* **23**(2), 127–147 (1967); and Frederic Holmes, 'Analysis by fire and solvent extractions: the metamorphosis of a tradition', *Isis* **62**(2), 129–148 (1971).

83 La Brosse, *op. cit.* (note 1), livre III, p. 309; livre V, pp. 675–677. On the issue of the occult qualities during this period, see the classic account by Keith Hutchison, 'What happened to occult qualities in the Scientific Revolution?', *Isis* **73**(1), 233–253 (1982). On alchemy and occult virtues, see Massimo Luigi Bianchi, 'The visible and the invisible: from alchemy to Paracelsus', in *Alchemy and chemistry in the 16th and 17th centuries* (ed. Piyo Rattansi and Antonio Clericuzio), pp. 17–50 (Kluwer, Dordrecht, 1994); Massimo Luigi Bianchi, 'Occulto e manifesto nella medicina del Rinascimento: Jean Fernel e Pietro Severino', *Atti e Memorie dell'Accademia Toscana Scienze e Lettere, Colombaria* **47**, 183–248 (1982).

84 The idea of 'fire' as 'artisan' comes from Paracelsus; on his complex views of fire, see Georgiana D. Hedesan, 'Fire, *Vulcanus* and alchemy in Paracelsus' (forthcoming).

claims, is called *chimie* by the moderns and *pyrotechnia* or 'the art of the fire' by the ancient Greeks.[85] The term *pyrotechnia* was used by Vanuccio Biringuccio (1480–1539) in a famous Renaissance compendium of metallurgical arts (*Pirotechnia*, 1540), but it became associated with alchemy at the turn of the seventeenth century. The assumption that *pyrotechnia* comes from 'ancient Greeks' chimes badly with La Brosse's admission of Paracelsianism as a novelty, but the term was adopted both by Davisson, the next Intendant of the Garden, and, directly or indirectly, by Jan Baptist Van Helmont (1580–1644).[86]

La Brosse argues that fire separates bodies into its components, an idea that was first expressed by Paracelsus and supported by Du Chesne.[87] In the Quercetanian version, upheld by La Brosse, all things could ultimately be reduced into salt, sulphur and mercury, understood as active principles. In addition to these, and again following Du Chesne, La Brosse admitted the existence of two elements, earth and water, understood as passive.[88] Interestingly, he describes these together as 'five substances' (*cinq substances*), apparently influenced in this by the new doctrine of Étienne de Clave and Antoine de Villon on the 'five principles'.[89]

La Brosse points out that there is another value for fire and distillation beyond true knowledge. He argues that alchemy allows the transformation of the raw and wild nature of plants into something milder and superior, by which he probably means making them more apt for medicine. He claims that alchemy allows plants to produce more flowers and fruits, extend their life and cure their illnesses, in a similar way to its action in metals and animals.[90]

La Brosse's chapter on alchemy is fashioned in the style of the increasingly popular manuals of chymistry that appeared during the period, and focuses only to some extent on the plant kingdom.[91] It is true that most of the examples he gives are related to plants, and that he claims that the sulphurs of plants are much easier to obtain than those of minerals.[92] His most intriguing contribution seems to lie in a rather interesting discussion

85 La Brosse, *op. cit.* (note 1), livre III, p. 293.

86 William Davisson published, during La Brosse's lifetime, *Philosophia Pyrotechnica, Willielmi d'Avissoni Scoti doctoris medici. Seu Curriculus chymiatricus nobilissima illa & exoptatissima medicinae parte pyrotechnica instructus* (Jean Bessin, Paris, 1635). Davisson's work, written in 1634, shows that he knew La Brosse. He was Intendant of the Jardin from 1646 to 1653. Van Helmont often referred to alchemy as *pyrotechnia*; see Georgiana D. Hedesan, *An alchemical quest for universal knowledge: the 'Christian philosophy' of Jan Baptist Van Helmont* (Routledge, London, 2016), pp. xii, 22, 89, 159 n. 155, 170. Although Van Helmont could have found the term elsewhere (it appears to have been occasionally used as an equivalent of alchemy), it is also possible that he read La Brosse: from his correspondence with Marin Mersenne it is clear that he was interested in the French alchemical scene, commenting at length on Jacques Gaffarel's *Curiositez inouyes*, which appeared in 1629. See 'Jean- Baptiste Van Helmont, à Bruxelles, à Mersenne, à Paris: 26 Septembre 1630', in *Correspondance du Marin Mersenne*, 17 vols (ed. Cornelis de Waard), vol. 2, pp. 530–541 (Gabriel Beauchesne, Paris, 1936). There are many interesting points of correspondence between Van Helmont and La Brosse, including their common interest in seeds, working spirits (called *Archeus* by Van Helmont), Hippocrates' *Regimen* and plants.

87 La Brosse, *op. cit.* (note 1), livre III, pp. 297–311. Du Chesne developed two matter theories, one at the beginning of his career and another towards the end; out of these, the simplest version, which posited three principles (salt, sulphur, mercury) and two elements (water and earth), won out, being taught (in an even more simplified form) by Jean Beguin. On Du Chesne's matter theories, see Didier Kahn, 'Helisæus Röslin, Joseph Du Chesne et la doctrine des cinq éléments et principes', in *Nouveau ciel, nouvelle terre. La révolution copernicienne dans l'Allemagne de la Réforme (1530–1630)* (ed. Miguel Ángel Granada and Edouard Mehl), pp. 339–354 (Les Belles Lettres, Paris, 2009); and Kahn 2004, *op. cit.* (note 8).

88 La Brosse, *op. cit.* (note 1), livre II, pp. 252–253; livre III, p. 296.

89 On de Clave's theories, see Bernard Joly, 'La théorie des cinq éléments d'Étienne de Clave dans la *Nouvelle Lumière Philosophique*', *Corpus* **39**, 9–44 (2001); and Antonio Clericuzio, *Elements, principles and corpuscles* (Kluwer, Dordrecht, 2000), pp. 42–47.

90 La Brosse, *op. cit.* (note 1), livre III, p. 413.

91 Kahn, *op. cit.* (note 7).

92 La Brosse, *op. cit.* (note 1), livre III, p. 369.

on the nourishing property; according to him, this property comes from the mercury principle.[93] At this point he asks himself why animals are not nourished by minerals, since they have the same mercury in their composition, and he answers that the mercury of a nature kingdom nourishes only the adjacent one, so that the mercury of minerals feeds only plants but not animals.[94] This perspective is essential if we are to understand La Brosse's support for plant alchemy.

La Brosse's rejection of minerals for alchemy in *On the nature of plants*

While his views of alchemy and the three principles are similar to those of other Paracelsians of his era, La Brosse's *On the nature of plants* parts ways with most of the Paracelsians in its exclusive advocacy of plant alchemy over the use of minerals or animals, which he rejects as sources of medicine. This is surprising given that, five years earlier, he was comfortable advocating the use of minerals, plants and animals in his *Treatise on the plague* (1623), praising firstly nitre and sulphur, and secondly juniper as universal medicines for the plague.[95] By his 1626 *Advis defensif*, however, his rhetoric had become acidic with regard to alchemists who pursued the philosophers' stone in four minerals: sulphur, mercury, vitriol and antimony.[96] The criticism of empirical alchemists had long been a trope of those deeming themselves alchemical philosophers. In this sense, La Brosse was only following this trend. On the other hand, he gives his attack a specific slant by directing it towards those who reject plants as feeble and weak and pursue only mineral alchemy. Interestingly, he accuses the 'bleeder' sect of secretly following these empirics and using mineral remedies as well.[97]

In *On the nature of plants*, La Brosse launches a strong attack on minerals in general. We may suspect that this stance may have been motivated by the subject matter of his work and a desire to promote the utility of his plant alchemy and of his Garden above all others. He hence claims that the usage of minerals is 'superfluous or vicious', arguing that:

> Of minerals we forged the coin, the seed of evil without number, the trinkets of women, the vessels dedicated to luxury and superfluity, the homicidal instruments which rage, pride and envy have invented against the peace of human nature, and the machines which seek to imitate thunder to the confusion of their inventors.[98]

Instead, La Brosse yearns for the simplicity of a golden age when people only ate plants, not animals, a view that he shared with his friend Pierre Gassendi (1592–1655), who similarly thought that Adam and Eve were vegetarians.[99] La Brosse even rejected the ancient

93 *Ibid*., livre IV, p. 474.

94 *Ibid*., livre IV, p. 478.

95 La Brosse 1623, *op. cit.* (note 21), pp. 95–100.

96 La Brosse, *op. cit.* (note 16), p. 29.

97 *Ibid*.

98 La Brosse, *op. cit.* (note 1), livre I, p. 3: 'Des Minéraux l'on forge la Monnoye, semence de maux sans nombre, les affiquets des femmes, les vases dediez au luxe à la superfluité, les instruments homicides, que la rage, l'orgueil, & l'envie ont inventez contre le repos de la nature humaine, & les Machines qui vont imitant le foudre à la confusion de leurs inventeurs.'

99 Justin Begley, 'Pierre Gassendi and the humanist case for a vegetarian diet', in *Passions, politics and the limits of society* (ed. Heikki Haara, Koen Stapelbroek and Mikko Immanen), pp. 75–88 (De Gruyter, Oldenburg, 2020).

necessity of using iron to plough the earth, believing that the earth was naturally more abundant during those lost paradisiacal conditions. In doing so, La Brosse is drawing on late antique tropes, particularly that of Pliny the Elder against luxury and mining.[100]

Nevertheless, to those who could object that we no longer live in those happy times, he claims that plants still have the greatest utility for human beings. Indeed, La Brosse spends a large amount of his work upholding the nobility of plants. As he puts it, they

> furnish good and sane drink, delicious and profitable food, health-bestowing medicine, the beautiful and clean garment, cover against the injuries of the air and the seasons, the utility of fire against the cold, and, for the accomplishment of many arts, the most beautiful colours for the tincture, the necessary instruments for work, the joy of the spirit, the health of the body, the length of life, and all that is needed to make it happy in its duration.[101]

Furthermore, La Brosse uses the Aristotelian hierarchy of minerals, plants and animals in order to argue that the plant kingdom's proximity to the animal one means that humans, insofar as they are animals, are best served by medicine produced from plants. In comparison, minerals are inferior; the fact that they are not meant for nourishment of animals should signal to us that they are simply not good to be used for medicine either.

La Brosse claims that alchemical practice shows that plants are just as good as minerals in many respects.[102] In fact, he maintains, we could theoretically dispense with mineral alchemy completely, except that plant alchemy is a much more difficult art and requires more expertise and labour to achieve its fruits.[103] He concedes that minerals can be transformed so as to be digested by human beings, but the results are not guaranteed. As an example, he points out that gold given in leaf form is inert, while that reduced to powder causes obstructions. Even when it is solved by alchemical means it is not always certain that it does not cause harm to the stomach and other organs.[104] Other metals are even more dangerous than gold, as they contain realgar and orpiment in their composition, both of which are poisons. La Brosse casts doubt on the myriad of methods to draw out tinctures, vitriols and sulphurs, maintaining that it is difficult to ascertain which of them is actually good.[105] The common preparation of antimony is particularly criticized, as its vomitive effects are doubtful. He admits that some plants—such as *napellus* and aconite—are poisonous, but plants can often be used without any rectification on the exterior of bodies, while minerals cannot.[106] Moreover, plants are easy to separate, and the medical application of plants is easy and short, without any variety or danger. Some plants can cure many diseases; for instance, absinthe is singled out as being able to cure 26 diseases.[107]

100 On this topic, see Andrew Wallace-Hadrill, 'Pliny the Elder and man's unnatural history', *Greece & Rome* **37**(1), 80–96 (1990).

101 La Brosse, *op. cit.* (note 1), livre I, p. 5: 'nous fournissent le bon & sain brevage, la viande deliceuse & profitable, le medicament salutaire, le vestement beau & net, le couvert contre les injures de l'air & des saisons, l'utilité du feu contre la froidure, & pour l'accomplissement de plusieurs Arts, les plus belles couleurs pour la teinture, les outils des mestiers nécessaires, la ioye de l'esprit, la sante du corps, la longueur de la vie, & tout ce qui luy est convenable pour la rendre bien-heureuse en sa duree'.

102 *Ibid*., livre V, p. 581.

103 *Ibid*., pp. 581–582.

104 *Ibid*., p. 584.

105 *Ibid*., p. 588.

106 *Ibid*., pp. 585–586.

107 *Ibid*., p. 588.

Having thus thrown doubt over mineral alchemy, La Brosse maintains that any physician must know how to employ plants for curing. He further addresses the issue raised by the possibility of producing a universal medicine out of minerals, which he calls 'the bird of Hermes'. Would not the discovery of such a medicine mean that there is no more need of plants for human use, he wonders. To this he responds that the true Paracelsians hold plants in high esteem, and know that, even if the universal remedy were available, this would not preclude the use of plants. Indeed, such a metallic medicine would need to be rendered friendly to the human body by 'vegetating' or, as La Brosse calls it, 'plantifying' it.[108]

Conclusions: empirical knowledge in the garden

Guy de La Brosse's *On the nature of plants* faded into oblivion in the course of the seventeenth century. Certainly, La Brosse was not a great writer: the treatise is not well organized and the quality of writing varies from clear to almost incomprehensible, despite being written in the author's native French.[109] He seemed conscious of his rhetorical shortcomings, and in turn tried to deflect criticism by complaining that alchemists had spent too much time arguing and too little working in the laboratory. He singled out Du Chesne, whom, as I showed, he otherwise followed in many ways, and particularly Andreas Libavius (ca 1555–1616), for writing too much; the latter, he quipped, compiled thick volumes to make himself the chief of the alchemical party.[110]

Instead, La Brosse cast himself as a tireless empirical practitioner and researcher.[111] I have shown how this empiricism is particularly focused on the detection of the internal character of plants, and its extraction for medical application. According to him, only continuous labour in the laboratory allows an alchemist to obtain the knowledge of plants, 'because with crossed arms one cannot find the secrets of nature'.[112] La Brosse's dedication to knowledge was doubled by his desire to perpetuate alchemy by means of hands-on education: although formally in charge at the Royal Garden of external demonstration of plants only, he was apparently one of the three internal demonstrators as well.[113] He also maintained a well-stocked laboratory there, which has been analysed by Rio Howard.[114] The 1636 image of the Garden shows that the main residence (*la maison*), was actively used as a laboratory, with several chimneys rising from the rooftops of the house and its immediate dependencies. Five of them were already in use by 1636.

Rhetorical problems aside, *On the nature of plants* is an intriguing and original work that makes a strong argument on behalf of the importance of plants. Clearly, La Brosse's argument

108 *Ibid*., p. 679. See above, note 33, for the Pseudo-Lullian roots of the notion of 'vegetating' minerals.

109 La Brosse did not write anything in Latin; this was probably a choice for him as he wished to distance himself from learned discourse and to emphasize the Royal Garden's national aspect.

110 La Brosse, *op. cit.* (note 1), livre III, p. 343: 'tesmoins les Alemans qui en compilent de si gros volumes, comme Libavius, pretendant par ce moyen se faire admirer & se faire chef de Part'.

111 His arch-critic, Guy Patin, described him, albeit derisively, as an 'empiric' who 'hardly knew how to read'; see 'À Johann Caspar Bauhin, le 9 septembre 1638' in Patin, *op. cit.* (note 39), https://www.biusante.parisdescartes.fr/patin/?do=pg&let=1035 (accessed 20 March 2023).

112 La Brosse, *op. cit.* (note 1), livre I, p. 45.

113 This can be surmised from the fact that there were two physicians hired as internal demonstrators, Jacques Cousinot and Urbain Baudinot; see Kahn, *op. cit.* (note 10), pp. 266–267.

114 Howard 1983, *op. cit.* (note 7), pp. 15–18, 40–47.

is written from a utilitarian perspective; his goal is the advancement of herbal medical alchemy. Yet, and perhaps surprisingly, his view of plants goes beyond a traditional rhetoric of usefulness. He did not need to posit that plants had sentient souls to advance his argument on behalf of using plants in medicine. Seen from a contemporary perspective, endowing plants with sensibility and emotion could pose ethical problems for employing them in the laboratory. However, La Brosse did not see a problem in admitting a sensory soul to plants and 'dissecting' them alchemically.

In fact, La Brosse's intention seems to be to make plants more familiar to us, and draw our attention to the affinity between plants and human beings. Besides endowing plants with an animal soul, he uses language that seems deliberately anthropomorphizing: the cucumber 'stretches' to reach water, plants produce 'a murmur of joy' when it rains in the summer, they change their position to breathe better, and so on.[115] The argument of the 'closeness' of plants to humans seems to be aimed in two directions. As suggested, it makes plants more apt to be used as medicine for the human body. At the same time, La Brosse argues that we should enjoy and admire plants in their variety and beauty, as they are even more dignified than the stars.[116] After all, the Royal Garden could delight visitors as much as increase their knowledge of plants. In this sense, La Brosse proposes a perspective that may be less common to us today: in his view, there is no sense of conflict between appreciating and using, between dissecting nature in the laboratory and admiring its beauty in the garden.

Data accessibility

This article has no additional data.

Declaration of AI use

I have not used AI-assisted technologies in creating this article.

115 La Brosse, *op. cit.* (note 1), livre I, pp. 60, 64, 73.

116 *Ibid*., pp. 2, 5, 121. La Brosse draws attention to the fact that, in the Genesis account, plants are described as being created before the stars (Gen. 1:11).