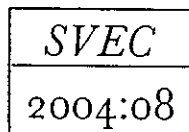


# Musique et langage chez Rousseau

*Etudes présentées par*

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## Rousseau and the languages of music and botany

Le botaniste ne souffre point d'intermédiaire entre la nature et lui. Il n'admet pour vrai que ce qu'elle lui montre, il rejette tout ce que les hommes y veulent ajouter de leur chef.<sup>1</sup>

### i. Mediation versus immediacy

ROUSSEAU'S botanist seeks an unmediated relation to nature, our 'mère commune',<sup>2</sup> and ultimate source of moral authority; for men lie, but nature never does.<sup>3</sup> The botanist, however, must suffer an 'intermédiaire' to come between himself and nature in order to communicate his knowledge to others; that intermediary is language, by which Rousseau means not only speech and writing, but also depictions of objects and symbols, such as he himself employed in his system of botanical signs. The author of the *Essay on the origin of languages* is fully aware of the mediated quality of this relation to nature; as Rousseau tells us in the opening lines of the *Essay*, speech is natural to man, it differentiates him from the other animals, and is, moreover, the first social institution<sup>4</sup>; languages progress from savages' painting of objects to barbarians' signs for words and propositions, and finally to the alphabets of so-called 'peuples policés'.<sup>5</sup>

Ultimately, therefore, Rousseau's relationship to languages of mediation is deeply ambivalent. While he believes language provides a crucial mediation between men and things, he longs for the unmediated relation to nature that requires no language whatsoever; it is intolerable that this

1. Rousseau, *Fragments de botanique*, OC, iv.1250. This statement encapsulates Rousseau's desire to overcome *différence*, to achieve transparency. See Jacques Derrida, *Of grammatology*, translated by G. Spivak (Baltimore, MD 1974), p.142-48; Jean Starobinski, *La Transparence et l'obstacle* (Paris 1971). It is consistent with Rousseau's often-stated position that nature never lies, only men do; men disfigure and deform nature. See for example Rousseau to the duchess of Portland, 12 February 1767, *Correspondance complète de Rousseau*, éd. R. A. Leigh, Voltaire Foundation (Oxford 1965-1998), 52 vols, xxxii.135, henceforward CC. To employ language at all is to accept the dubious authority of men.

2. Rousseau, *Réveries du promeneur solitaire*, OC, i.1066.

3. Rousseau, *Discours sur l'origine de l'inégalité*, OC, iii.133.

4. Rousseau, *Essai sur l'origine des langues*, OC, v.375.

5. Rousseau, *Essai sur l'origine des langues*, OC, v.385.

most precious and fundamental of relations should be mediated by language, 'la première institution sociale'.<sup>6</sup> The goal of freedom from mediation is one that Rousseau maintains, even though he knows its practice is impossible.

### a. Method of approach

In this essay I examine Rousseau's musical and botanical systems of notation, pointing out that they share much in common. I argue that within these systems Rousseau's choices of languages or systems of representation are not neutral; rather, they are well thought out and explicit choices, calculated to win acceptance and an enhanced understanding for these studies. The choices Rousseau makes in constructing these systems must be understood within the context of eighteenth-century science. The relatively marginal status occupied by music and botany in Rousseau scholarship has, I believe, tended to obscure the degree to which his advocacy of particular linguistic practices within these branches of study is deeply embedded in the literary technologies and social life of eighteenth-century science.<sup>7</sup>

I situate Rousseau's music and botany within the frame of the rhetorical conventions, meanings, contexts, and audiences for these sciences. Rousseau's musical and botanical rhetoric was to be, following Bacon and Locke, no rhetoric at all, but rather, the accurate, simplified and radically clarified new language that would restore to things their truthfulness and simplicity. For the purposes of this paper, I consider systems of nomenclature, classification and representation as languages, and those who use these systems as communities of linguistic practitioners. I draw on recent work in the history of science, in which 'the "rhetoric of science" is now a well established sub-field'.<sup>8</sup> These studies examine the problem of language and rhetoric posed by a science that purports to produce objective findings and value-free descriptions. Is a value-free, objective presentation possible, or even desirable? Are Rousseau's symbol systems in music and botany constructed in order to solve the rhetorical problem or merely to deploy rhetoric in another guise for its ancient

6. Rousseau, *Essai sur l'origine des langues*, OC, v.375. This is true for important pedagogical reasons as well. Rousseau's pedagogical principles prescribe a non-representational alternative to conventional teaching practices: 'En général ne substituez jamais le signe à la chose que quand il vous est impossible de la montrer. Car le signe absorbe l'attention de l'enfant, et lui fait oublier la chose représentée,' Rousseau, *Emile ou de l'éducation* III, OC, iv.434.

7. I do not attempt in this essay an examination of the biographical details that point to the many parallels between Rousseau's study and practice of music and botany. Rousseau states that he abandoned botany for music as a young man, but asserts that had he pursued botany, he might have become a great botanist (Rousseau, *Confessions* V, OC, i.180). Later, he divides his time between botany and music copying.

8. Jan Golinski, *Making natural knowledge: constructivism and the history of science* (Cambridge 1998), p.104.

purpose, the political persuasion of people? I argue that like other luminaries of the Scientific Revolution, Rousseau deploys the 'idea' of neutral, simplified and non-rhetorical languages for botany and music to distinct ends – moral and social ends in his case.

My portrayal of Rousseau's musical and botanical activity may seem to make the man of 'paradoxes'<sup>9</sup> appear surprisingly conventional, but this is precisely my goal in this context. I argue that Rousseau's observance of these conventions is no mere herd behaviour, but rather, like other scientists of his day who espoused accessibility,<sup>10</sup> he has a political stake in making music and botany clearer, and therefore easier to learn.<sup>11</sup> Rousseau finds it expedient to adopt and adapt conventions rather than to explode them. This is most important for our consideration of music and botany, two fields of inquiry that Rousseau treats in a conventional scientific manner, accepting reigning norms of experiment, symbolic representation, plain speech, accessibility, civility, and concern for questions of nomenclature.<sup>12</sup>

As I have argued elsewhere, botany in particular, but also music, rank among those sciences and arts that could be redeemed by serving moral and social ends. In being administered in the right doses by a latter day philosopher-king, they promote the homeopathic cure of the sick society portrayed in the *Discourses*.<sup>13</sup> Mine is a non-reductive account; in other words, I do not reduce Rousseau's scientific activities to systems of signs or rhetorical gestures. His activities in music and botany were not only expressions of genuine, lifelong interests, but were also part of his philosophical system. Hence, Rousseau's rendering of natural knowledge in tables, signs and other 'literary technologies' must be understood as only one aspect of the exercise in which he was engaged.<sup>14</sup>

9. Rousseau, *Fragments pour un dictionnaire des termes d'usage en botanique*, OC, iv.1246.

10. Rousseau considered his herbaria another avenue of access to botany (Rousseau to the duchess of Portland, 17 April 1772, CC, xxxix.41-42). See also Jan Golinski, *Science as public culture: chemistry and Enlightenment in Britain, 1760-1820* (Cambridge 1992), ch.I.

11. This argument contradicts Rousseau's critique of scientific popularisation in the *Discours sur les sciences et les arts*, yet he has been called 'l'artisan en France de la popularisation des idées linnéennes' (Pascal Duris, *Linné et la France*, Geneva 1993, p.105), and in England he was imitated by Maria Elizabeth Jacson and Priscilla Wakefield. See Alexandra Cook, 'Propagating botany: the case of Jean-Jacques Rousseau', in *The Transmission of culture in Western Europe, 1750-1850: papers celebrating the bi-centenary of the foundation in Geneva of the Bibliothèque Britannique*, ed. David Bickerton and Judith Proud (Bern 1999), p.69-94.

12. See Lorraine Daston, 'Baconian facts, academic civility, and the prehistory of objectivity', in *Rethinking objectivity*, ed. A. Megill (Durham, NC 1994), p.37-63.

13. Cook, 'Jean-Jacques Rousseau: paradoxes of a famous botanical author', Work-in-progress seminar, 6 April 2001, Humanities Research Centre, The Australian National University. For a general comment on Rousseau's notion of the homeopathic cure, see Nicole Fermon, *Domesticating passions: Rousseau, woman and nation* (Hanover, NH 1997), p.27-28.

14. I borrow a phrase from Stephen Shapin, quoted in Golinski, *Making natural knowledge*, p.108.

ii. The problem of rhetoric and science –  
the seventeenth-century prehistory

Rhetoric did not enjoy a favourable reputation in seventeenth-century Europe. During the scientific revolution, the literary aspect of scientific knowledge production became an acute issue. The language advocated (if not consistently practiced) by Francis Bacon, and later the Royal Society, was to be 'simple and not abstruse', free of the snares of the rhetoricians, and especially the Scholastics.<sup>15</sup> Bacon diagnosed the illusions wrought by our use of discourse, or what he called the 'idols of the marketplace': 'For men believe that it is their reason that controls words. But it is also true that words retort and turn their force back upon the understanding [...] definitions themselves consist of words, and words beget words, so that it is necessary to have recourse to particular instances and their sequences and orders.'<sup>16</sup> Locke denounced rhetoric as a source of error and deceit, while Rousseau identified the origins of 'eloquence' in no less than four vices – ambition, hatred, flattery and lying.<sup>17</sup> Hence, 'the new philosophy of that period was vehemently anti-rhetorical [...] The numerous schemes for artificial and universal languages sought to free discourse from the distortions of figural usage, so that each thing would have just one name.'<sup>18</sup>

This point is readily illustrated by the transformations of botanical nomenclature in the eighteenth century. Like other scientific practitioners trying to cope with the 'information explosion' that began in the Renaissance,<sup>19</sup> Rousseau articulated the need for consistent nomenclature: 'tantôt d'anciennes plantes proposées sous de nouveaux noms suffisaient pour enrichir de nouveaux charlatans. Ces plantes avaient des noms vulgaires différents dans chaque canton.' The long descriptive phrases of authorities such as Jean and Gaspard Bauhin and Tournefort made matters no clearer: 'Ainsi la nomenclature se chargeait. Les noms des plantes devenaient non seulement des phrases mais des périodes.' A separate, but very significant problem arose as Europeans' 'voyages de long cours enrichissaient incessamment la botanique de nouveaux trésors',<sup>20</sup> further fuelling the early modern information explosion.

These circumstances made the invention of new names, and agreement on those to apply to already known plants, pressing matters. Without the assignment of one name to each thing, chaos was inevitable: 'C'en était fait de la botanique si ces pratiques eussent été suivies; devenue absolument insupportable, la nomenclature ne pouvait plus subsister dans cet état, et il fallait de toute nécessité qu'il s'y fit une réforme.'<sup>21</sup>

Rousseau notes that the method of learning botany depends upon the one-to-one relation between the name and the thing named, the linguistic practice integral to the new, reformed language of the scientific revolution: 'Il faut en botanique [...] du moins apprendre empiriquement les noms d'un certain nombre de plantes avant de vouloir les étudier méthodiquement: il faut premièrement être herboriste et puis devenir botaniste après, si l'on peut.'<sup>22</sup>

This new philosophy of scientific language was in turn based upon experiment and observation, as opposed to obedience to the dictates of authority or superstition; language was to be used not to generalise, but to enumerate particular facts, as prescribed by Bacon.<sup>23</sup> These facts were to be established by experience, a term bearing the meaning both of experimentation as now understood, as well as broader notions of accumulation of information and knowledge.<sup>24</sup> In the preface to his *Projet concernant de nouveaux signes pour la musique* Rousseau announces himself to be an adherent of the Baconian norms: 'j'ose croire qu'elles doivent tomber devant les vérités de démonstration que j'ai à établir, si l'on me juge au tribunal de l'expérience et de la raison: mais si on m'attaque par des préjugés je n'ai plus rien à répondre, et je ne connais point d'armes contre les préjugés'.<sup>25</sup> After presenting his system to the Académie's commissioners, Rousseau comments that educated persons may be less prejudiced in general, but when they are prejudiced, they are so to a degree that exceeds that of ordinary persons. Needless to say, Rousseau had an interest in undermining the commissioners' opinions, which affected him adversely, but it is nonetheless significant that he chooses to condemn their opposition to his system on the grounds that they are 'prejudiced', and not against him as a person, but rather, as a result of

15. Francis Bacon, *The New organon*, ed. L. Jardine and M. Silverthorne (Cambridge 2000), p.104.

16. Bacon, *New organon*, p.48. The emphasis is original.

17. Rousseau, *Discours sur les sciences et les arts*, OC, iii. 17. The other sciences and arts are, by comparison, identified with one vicious cause apiece!

18. Golinski, *Making natural knowledge*, p.105. The emphasis is added. See also Mary M. Slaughter, *Universal languages and scientific taxonomy in the seventeenth century* (Cambridge 1982). A universal language 'meant an ideographic writing system similar to Chinese characters [...] Egyptian hieroglyphics, algebraic symbols [...] and the like', Slaughter, *Universal languages*, p.85. Rousseau's botanical system displays both hieroglyphic and algebraic elements.

19. Slaughter, *Universal languages*, p.10.

20. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', OC, iv. 1202-05.

21. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', OC, iv.1205. According to Rousseau's 'master' in botany, Carolus Linnaeus, 'more new names have crept in than were ever bestowed at the bidding of any Dictator'. Linnaeus, 'Preface', *Critica botanica*, translated by A. F. Hort (London 1938), p.xxi-xxv.

22. Rousseau to the duchess of Portland, 12 February 1767, CC, xxxii.134.

23. 'Bacon is the pivotal figure in the rehabilitation of facts as knowledge.' Daston, 'Baconian facts', p.45.

24. See 'Expérience' and 'Expérimental', in *Encyclopédie, ou dictionnaire raisonné des arts et des métiers*, ed. Denis Diderot and Jean Le Rond D'Alembert (Paris 1751-1772), ARTFL online edition, [www.lib.uchicago.edu/efits/ARTFL/projects/encyc](http://www.lib.uchicago.edu/efits/ARTFL/projects/encyc), 14 June 2001.

25. Rousseau, OC, v.129. The meaning of the term 'experience' changed in the course of the seventeenth century to denote specific events, especially experiments, rather than generalisations. Daston, 'Baconian facts', quoting Dear, p.41.

their ignorance of music, which caused them to fail to see either the utility or novelty of his contribution.<sup>26</sup> In his encounter with the Académie, Rousseau stresses a rhetorical practice central to the social relations and discourse of eighteenth-century science: decorous and civil speech. While rejecting the proposal, the Académie nevertheless complimented its author.<sup>27</sup>

In his representational systems for music and botany Rousseau follows conventional scientific practice in providing what he claims are simple and clear languages. His notation system for music is supposed to be 'plus simple', 'plus précise' and 'plus aisée à apprendre'.<sup>28</sup> This reform includes the reduction – and this is the most important point here – in the 'nombre des signes et de leur combinaison'.<sup>29</sup> Hence Rousseau writes, 'Je fonde l'utilité de mon système sur son extrême facilité'.<sup>30</sup> Rousseau's hopes for rendering botany 'plus aisée à apprendre' are suggested by his authorship of a botanical dictionary and a system of signs to denote species, plant parts and other botanical information. While we have no equivalent statements justifying his system of botanical signs,<sup>31</sup> I believe it is reasonable to infer from statements in his correspondence that Rousseau would have advanced similar claims for simplicity and ease of access on behalf of his botanical symbols as well. He laments, for example, the absence of good elementary introductions to the science of botany: 'Il nous manque un livre vraiment élémentaire, avec lequel un homme qui n'aurait jamais vu de plantes put parvenir à les étudier seul'.<sup>32</sup>

Jacques Henri Bernardin de Saint-Pierre (1737-1814) is the sole authority for our knowledge of how Rousseau regarded his symbol system for botany. Bernardin, who served briefly as intendant of the Jardin des plantes (1792-1793), botanised with Rousseau near the end of the latter's life, and recounted these experiences in his *Etudes de la nature*. Bernardin writes of the symbols:

les uns représentaient les formes des fleurs; d'autres, celles des feuilles; d'autres, celles des fruits [...] Il n'employait que neuf ou dix de ces signes, pour former l'expression d'une plante. Il en avait de placés les uns au dessus des autres, avec des chiffres qui exprimaient les genres et les espèces de la plante, en sorte que vous les eussiez pris pour les termes d'une formule algébrique.<sup>33</sup>

26. Rousseau, *Confessions* VII, OC, i.284.

27. *Extraits des registres de l'Académie des Sciences*, 1742, t.61, appendice 45, CC, i.322. Shapin and Schaffer note that civility was seen as necessary because 'potential contributors of matters of fact, however misguided they might be, must be treated as possible converts to the experimental form of life', quoted in Daston, 'Baconian facts', p.53.

28. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.

29. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.

30. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.

31. Albert Jansen, *Jean-Jacques Rousseau als Botaniker* (Berlin 1885), p.233, shares this view.

32. Rousseau to the duchess of Portland, 12 February 1767, CC, xxxii.134.

33. Quoted in Roger de Villemorin, 'Introduction: *Lettres sur la botanique*, *Fragments pour un dictionnaire de botanique*', OC, iv.cci.

Rousseau tells Bernardin that 'quelque ingénieuse et expéditive que fût cette méthode [...] il y avait renoncé parce qu'elle ne lui présentait que des squelettes'.<sup>34</sup>

Rousseau's claim to function as a reformer echoes an important theme of the scientific revolution; this claim harks back, of course, to the Protestant reformation, but it also plays a critical role in the self-understanding of key players in the scientific revolution. With the notion of reformer two key concepts are connected: renewal on the one hand, and the return to fundamental principles, free of superstition, deception and frivolous novelty, on the other. These are possibly two sides of the same coin. The reformer is a kind of heroic figure, beating down opponents, slaying the dragons of misrepresentation and falsehood. In short, the scientific reformer stands on the side of truth. In music Rousseau sees himself as a reformer, a revolutionary, even;<sup>35</sup> in botany his aspirations and claims are more limited, although the voice of the reformer still comes through: 'tous les botanistes qui ont voulu jusqu'ici des définitions de la fleur ont échoué dans cette entreprise et les plus illustres [...] n'ont pas même tenté de la surmonter',<sup>36</sup> Rousseau therefore supplies his own detailed definition.<sup>37</sup> Linnaeus is the heroic reformer of a chaotic nomenclature: 'Enfin M. Linnaeus, plein de son système sexuel et des vastes idées qu'il lui avait suggérées, forma le projet d'une refonte générale dont tout le monde sentait le besoin, mais dont nul n'osait tenter l'entreprise'.<sup>38</sup>

#### a. From simplicity to utility

The pursuit of simplicity and clarity might in any given case require an altogether new system; indeed, the Académie royale des sciences of Paris required that in order to receive its approbation, a proposal had to present something both 'neuf' and 'utile'.<sup>39</sup> Yet in the preface to his *Projet concernant de nouveaux signes pour la musique* (1743), Rousseau, as we have seen, defends the novelty of his system on the basis of its utility, while cautioning against novelty for its own sake:

Dans le goût où l'on est aujourd'hui de publier incessamment de nouvelles méthodes et de nouveaux systèmes, il est très avantageux que le public se tienne en garde contre tout ce qui se présente à lui avec un certain air de nouveauté [...]

Ce que je dis en général sur toutes les sciences s'applique à la Musique encore avec bien plus de précision, puisque tous les projets d'innovation qu'on a voulu former sur cet art n'ont servi qu'à rendre plus sensible la perfection où il paraît

34. Rousseau, *Caractères de botanique*, OC, iv.1830.

35. Rousseau, *Confessions* VII, OC, i.286.

36. Rousseau, *Fragments pour un dictionnaire de botanique*, OC, iv.1221.

37. See Rousseau, 'Fleur', *Fragments pour un dictionnaire de botanique*, OC, iv.1222.

38. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', OC, iv.1205.

39. *Extraits [...] de l'Académie des sciences*, CC, i.319.

être par des comparaisons où l'ancienne méthode avait toujours à gagner et qui n'ont jamais manqué de jeter les nouveaux [projets] dans le décri.<sup>40</sup>

Rousseau, no stranger to transports of passion, threw himself into this project with what may seem to modern readers an unscientific zeal; in the *Confessions* he writes, 'Je m'enfermai dans ma chambre et travaillai deux ou trois mois avec une ardeur inexprimable à refondre dans un ouvrage destiné pour le public le mémoire que j'avais lû à l'Académie.'<sup>41</sup> In other words, Rousseau was passionate in his desire to pass over the threshold of acceptability prescribed by the most esteemed scientific body in France. Rousseau does not attempt, *pace* Saint-Amand, to destroy or undermine the *statut* of science – quite the contrary, in fact. There is no 'rejet global des sciences du *Discours sur les sciences et les arts*'<sup>42</sup>; this is not the import of the *Discours sur les sciences et les arts*, *Emile* or even the *Rêveries*. Rousseau leaves the parameters and methods of the sciences intact, preferring to question the motives and native abilities of many so-called scientists. Similarly, Rousseau's defense of Linnaeus is founded in the first instance not on the novelty of the latter's binomial nomenclature, but rather, on the utility of that system: 'la grande commodité de cette nouvelle nomenclature et son utilité que l'usage a fait connaître, l'on fait adopter presque universellement dans toute l'Europe [...] et même à Paris'.<sup>43</sup>

### iii. Symbols and tables

I have argued that Rousseau purposively adopts conventional rhetorical approaches to the sciences, including systems of symbols for music and botany. Such tools of symbolic representation were in widespread use; they provided scientific practitioners in the first instance with a means of encapsulating and framing their knowledge of nature in a way that audiences already accustomed (for example, to the chemical symbol system and to mathematics) would understand and accept. Second, such systems helped to secure legitimacy for insecure sciences struggling for recognition as independent fields of inquiry; third, and this is very important to Rousseau, these systems provided practitioners with common languages and shorthand systems of notation.<sup>44</sup> Finally, they provided the appearance of precision, and modernity; they suggested an almost mathematical certainty, a feature that chemistry and botany were,

40. Rousseau, *OC*, v.129.

41. Rousseau, *Confessions* VII, *OC*, i. 286.

42. Pierre Saint-Amand, 'Rousseau contre la science: l'exemple de la botanique dans les textes autobiographiques', *SVEC* 219 (1983), p.159-67 (p.159).

43. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', *OC*, iv.1207.

44. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', *OC*, iv.1207.

in many quarters, thought to lack.<sup>45</sup> Hence Bernardin employs the phrase, 'formule algébrique', to describe Rousseau's botanical symbols.<sup>46</sup>

Presentation of information about nature and natural processes as symbols, framed within tables, is a commonplace of eighteenth-century science; such techniques of presentation were already part of mathematics, considered solid in its conclusions, and chemistry, a newer, and far less well-established field.<sup>47</sup> Systems of symbolic representation may now seem transparently necessary and their veracity unassailable (for example, in the case of the periodic table). However, these are creations of a particular era and a particular culture. This culture was increasingly abstract and quantitative in its apprehension of nature; symbolic systems such as those advanced by Rousseau may have been novel in their content, but the approach he adopted lay well within the parameters of eighteenth-century 'normal science', to borrow a phrase from Thomas Kuhn.

While Rousseau's system of signs in music<sup>48</sup> had predecessors in the systems of Souhailty, Sauveur and Demoz,<sup>49</sup> I propose that the sheer visual resemblance between the tabular arrangement of Rousseau's numerical notation system and the tables of chemistry is hardly accidental.<sup>50</sup> Consider for example the appearance of the early eighteenth-century table of chemical relations on which chemical substances are represented by symbols arranged on a grid showing their reactions, or 'combinations', with each other. These chemical symbols, inherited from alchemy, were used by Etienne François Geoffroy (1672-1731) in his famous 'Table des différents rapports observés entre différentes substances' of 1718.<sup>51</sup> In the 1740s Rousseau studied chemistry, and together with Diderot, attended the lectures of the famous Guillaume-François Rouelle (1703-1770) at the Jardin du roi; Rousseau likewise assisted his patron, Dupin de Francueil, who had aspirations to the Académie, by

45. See Lissa Roberts, 'Setting the table: the disciplinary development of eighteenth-century chemistry as read through the changing structure of its tables', in *The Literary structure of scientific argument*, ed. P. Dear (Philadelphia 1991), p.99-132.

46. Rousseau, *Caractères de botanique*, *OC*, iv.1830.

47. The chemical symbols derive from alchemy, which was in many ways chemistry's predecessor. While increasingly suspect, alchemy was still pursued by respectable scientists until the late eighteenth century, albeit clandestinely. See Allen G. Debus, 'Alchemy in an age of reason: the chemical philosophers in early eighteenth-century France', in *Hermeticism and the Renaissance: intellectual history of the occult in early modern Europe*, ed. I. Merkel and A. G. Debus (Washington DC 1988), p.231-50, and Allen G. Debus, *The French Paracelsians* (Cambridge 1991), p.201.

48. Rousseau, *Projet concernant de nouveaux signes pour la musique*, *OC*, v.144.

49. Albert Cohen, *Music in the French Royal Academy of Sciences: a study in the evolution of musical thought* (Princeton, NJ 1981), p.70.

50. Note that Rousseau calls this arrangement of musical notation a 'table', one that aims at providing a total picture of 'toute l'étendue du clavier'. Rousseau, *Projet concernant de nouveaux signes pour la musique*, *OC*, v.143.

51. *Mémoires de l'académie des sciences* (Paris 1718), p.202-12, reproduced in Roberts, 'Tables', p.105, plate I.



those who were prepared to adopt the sexual system and its loaded assumptions. The artificial system was especially useful to colonial or travelling naturalists exploring regions in which they encountered plants previously unknown to Europeans. In France, however, Linnaeus was not accepted for some time, preference being given to the systematic organisation of flowering plants offered by Bernard de Jussieu (1699-1777) at the Trianon Garden in the mid-eighteenth century, and approved by such doyens of French natural history as Buffon, intendant of the Cabinet du roi, and his collaborator, Daubenton.<sup>57</sup> Rousseau does not limit himself to the artificial Linnaean system of sexual classification, either (although this has been little recognised). He also uses that of Jussieu, with whom he was acquainted. The eight letters to Mme Delessert on botany<sup>58</sup> are based not on Linnaean systematics, as one might expect from Rousseau's praise for Linnaeus,<sup>59</sup> but on the natural family system of classification developed by Jussieu. Rousseau's definition of the cotyledon (the incipient leaf) notes the contribution of Jussieu, as well as an important predecessor, the English botanist, John Ray (1627-1705), to classifications based on the cotyledons.<sup>60</sup>

While my remarks about Rousseau's botanical symbols can at this stage only be suggestive and provisional, it is clear that Rousseau's botanical signs substitute symbolic representations for the Latin descriptions provided in the *Species plantarum* (1753) of Linnaeus. Linnaeus himself does not do this; he limits his shortest shorthand to a two-word phrase, the so-called binomial name, consisting of the genus name and the *nomen triviale*, or trivial (that is to say, arbitrary) name. He rejects purely figural descriptions of species and genera on several grounds,<sup>61</sup> despite his collaboration with G. D. Ehret in producing the famous engraving of twenty-four plants standing for the *classes literae* of the artificial system.<sup>62</sup> In his works Linnaeus provides descriptions of plants in Latin, which although abbreviated in comparison to those of earlier authors, nevertheless consist of several words, or even phrases; *Amomum zingiber* is described in four words, for example.

Space constraints do not permit me to explore in greater depth the context for, and implications of, Rousseau's preoccupation with systems of plant classification and the ways he tried to represent plants within these

systems; suffice it to say that this preoccupation was extensive, and offered important means to address such moral and political concerns as the reform of society through the homeopathic application of measured doses of the sciences. In such measured doses, sciences such as botany could offer up edifying visions of the design of God's creation because 'les végétaux dans nos bois et dans nos montagnes sont encore tels qu'ils sortirent originairement de ses mains'.<sup>63</sup> This desire to enlist botany among the instruments of moral and social reform prompted Rousseau to develop a concerted system for the efficient shorthand embodied in his botanical symbols, a project having, in the end, no more success than his reformed system of notation for music.

However, what I think should interest us is not the success or failure of Rousseau's system of botanical notation, or, for that matter, what the particular signs denoted. Rather, we should concern ourselves with what Rousseau thought he was doing: why should he develop yet another system of signs, given the fate of his system of musical notation? Why, indeed? We find Rousseau's answer in the preface to the *Projet concernant de nouveaux signes pour la musique*: like notes in music, the recording of botanical information can be rendered 'plus simple', 'plus précise' and 'plus aisée à apprendre'.<sup>64</sup> In the botanical symbol system there would presumably be a reduction not in the 'nombre des signes et de leur combinaison',<sup>65</sup> but rather, in the number of words. However, given the number of symbols one would have to learn to become an adept of Rousseau's botanical symbolism, it is doubtful that Rousseau could claim for this botanical system that it was founded 'sur son extrême facilité'.<sup>66</sup>

57. Alexandra Cook and Christopher Kelly, 'Introduction', *The Collected writings of Rousseau*, ed. C. Kelly (Hanover 2000), viii.xxi-xxvi.

58. Rousseau, *Lettres sur la botanique*, OC, iv.1151-95.

59. Rousseau, *Fragments pour un dictionnaire de botanique*, 'Introduction', OC, iv.1205.

60. Rousseau, *Fragments pour un dictionnaire de botanique*, OC, iv.1217.

61. 'I do not recommend Figures for determining genera, but absolutely reject them, leaving them to confer something to unlearned people.' Carolus Linnaeus, 'Ratio operis', *Genera plantarum*, 5th edn (Stockholm, Laurentius Salvius, 1754), par. 13, vii, translated by Staffan Müller-Wille, who pointed out to me the relevance of this passage in this context.

62. Carolus Linnaeus, *Systema naturae*, facsimile edn, translated and edited by M. S. J. Engel-Ledeboer and H. Engel (1735; Nieuwkoop 1964), no page number.

63. Rousseau to the duchess of Portland, 12 February 1767, CC, xxxii.135.

64. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.

65. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.

66. Rousseau, *Projet concernant de nouveaux signes pour la musique*, OC, v.130.