A herbarium of roses in early 19th century at the crossroad between botany and horticulture: interwoven networks, entangled curiosities

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ABSTRACT: This article focuses on a herbarium made in the early 19th century by André Dupont (1742-1817), a French rose-grower. The herbarium is uncommon, as the author took a lot of liberties with botanical standards of the time, in terms of the choice of plants, names, classifications, organisation of the plates, content of the handwritten notes on the labels, etc. Using historiographical approaches to collections as encounters between networks rooted in disparate or neighbouring cultures, the article argues that the significance of such disconcerting object is enhanced by its contextualisation both in the status of its author and in the history of the plants it contains. It demonstrates that Dupont's herbarium of roses expresses a form of curiosity, inspired by botanical practice but oriented towards a special kind of gardening, that of connoisseurs. It reflects a way of thinking and paying attention, a concern for cultivation and preserving plants representative of a new insight into the diversity of roses in early 19th century.

KEYWORDS: crops herbarium, roses, horticulture, gardening, amateurs' knowledge, diversity of ornamental plants.

1. Introduction – An uncommon herbarium (*)

> There is a collection of roses in the herbarium of cultivated plants in the Museum's cultivation laboratory, with samples dated between 1799 and 1811, although there is no information about its author[1].

So begins an investigation to identify the author of an "anonymous old herbarium of roses". André Guillaumin, professor at the Muséum National d'Histoire Naturelle of Paris considered a series of clues: paper, labels, layout, handwritten mentions of plant origins, and the state of knowledge about rose species around 1800. He concluded that the author "must have been a specialist in roses" and attributed the authorship to a physician, namely Dr. Barbier. In 2015, while carrying out research for a book on André Dupont (1742-1817), the historian Vincent Derkenne reached a different verdict. The herbarium was composed by Dupont, one of the first French gardeners to specialize in collecting, growing and propagating roses in France in the early 19th century[2]. Once its origins have been ascertained, the herbarium could reveal its informative potential. However, the botanical criteria for judging the value of a herbarium remain somewhat disconcerting.

At first glance, Dupont's herbarium has nothing unusual from a technical point of view. It contained 232 plates, made on a paper decorated with frames. Specimens were fixed with small pieces of paper and associated with labels, according to the material practices for herbaria. However, the similarities stop here. What makes Dupont's herbarium particularly intriguing is the choice of plants. All the plants belong to the genus *Rosa* but, apart from some specimens of spontaneous species, most are garden roses, with beautiful large flowers, and many of them are morphological anomalies. At that time, making herbariums was a side line to the study and the teaching of botany, mainly focused on spontaneous plants; hence botanists expressed rules concerning the representativeness of plants and the use of a classifi-

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1. André Guillaumin, "Vieil herbier de Roses au Muséum", *Bulletin du Muséum national d'histoire naturelle,* série 2, no. 19 (1947) 354-356.
2. Vincent Derkenne, *André Dupont (1742-1817). Un palais et des Roses* (Books on Demand, 2020) 212-215. Vincent Derkenne, "L'herbier de roses d'André Dupont", *Roses anciennes en France,* n.º 23 (2016).

cation system[3]. Yet some plates in Dupont's herbarium are composed of plants belonging to different species of the genus *Rosa*, while others gathered only leaves or petals. Some labels mention Latin names, according to the binominal Linnaean nomenclature, while others indicate vernacular names commonly used by gardeners. Many plates bear chronological indications, sometimes several years on the same one. Labels are not written in any standard format, and they are heterogenous: information about the person who gave the plant, the precise location in Dupont's garden, comments on grafting, on colours, etc.[4]

While botany became a popular science, one could easily conclude that this herbarium was made by a dilettante, an amateur with little knowledge of the rigors of botanical practices, as it took a lot of liberties with existing standards. If it were just a question of approximations, or errors, it would make sense to interpret this herbarium as a failed imitation of the botanical practice. Does the lack of respect for botanical rules turn the herbarium in an irrelevant, marginal and worthless collection? Our methodological hypothesis is that changing the perspective of the historical study can re-evaluate the nature of the object itself.

Historiography on collections and popular science revealed how actors endowed with a diversity of resources, experience and intentions were involved in the circulation of knowledge and objects[5]. Collections took part of codification in institutionalised naturalist practices as they were in the dilettantism of curiosity cabinets[6]. Seen as encounters, they brought to light the intersection of networks rooted in disparate or neighbouring

3. Émilie-Anne Pépy, "Décrire, nommer, ordonner : enjeux et pratiques de l'inventaire botanique au XVIIIe siècle", *Études rurales*, n.º 195 (2015): 27-42. https://doi.org/10.4000/etudesrurales.10235; Marie-Noëlle Bourguet, Pierre-Yves Lacour, "Les mondes naturalistes: Europe (1530-1820)", in *Histoire des sciences et des savoirs. Tome 1: de la Renaissance aux Lumières* (Paris: Seuil, 2015), eds. Dominique Pestre, Stéphane Van Damme, 262-276; Christian Bange, "Les collections botaniques privées en France au XIXe siècle" in *Mécènes et collectionneurs: les variantes d'une passion*, eds. Jean-Yves Ribault (Paris: Editions du CTHS, 1999), 179-198; Alette Fleischer, "Leaves on the Loose: The Changing Nature of Archiving Plants and Botanical Knowledge" in *Journal of Early Modern Studies,* 6, n.º 1 (1997): 117-135. https://doi.org/10.5840/jems2017616
4. Dupont's herbarium does not have a catalogue number in Muséum National d'Histoire Naturelle's collections, and the plates are not paginated. The footnotes refer to the entire herbarium in the form: MNHN ROSA-Vieil herbier de roses.
5. Nathalie Richard, "Introduction: amateurs et amatrices du XIXe siècle", *Romantisme. Littérature, arts, sciences, histoire,* no. 190, 2020: 5-15. https://doi.org/10.3917/rom.190.0005
6. Bourguet, Lacour, "Les mondes naturalistes: Europe (1530-1802)", 256-276.

cultures[7]. More mobile than other natural objects, thanks to the convenience of transport and propagation, plant collections are versatile because they attract a range of different interests, from leisure gardening to botany and trade[8]. By studying the common spaces (cultivated fields, gardens, towns) and the materiality of practice, historical investigations succeeded in demonstrating that the apparent separations and hierarchies were in fact underpinned by heterogeneous networks and a broad range of intermediate statuses[9].

Dupont's appreciation of roses was shaped by his botanical knowledge of roses and his advanced skills in gardening, which together influenced his sensibility. This reflects a way of thinking and paying attention, a concern for cultivation and preserving plants emblematic of a new insight into the diversity of roses in early 19th century. This paper aims to demonstrate that Dupont's herbarium embodies a form of curiosity, inspired by botanical practice but oriented towards gardening. This was not ordinary gardening, but an informed practice that is difficult to categorise precisely. At the time, the most common category used to distinguish this practice was that of *connoisseur*. The value of connoisseurship in gardening was judged by the combination of botanical knowledge, practical experience and a commitment to plant diversity. The status of *connoisseur* transcended the distinction between commercial and leisure (amateur) gardeners, as long as they did not just grow plants, but stayed informed through gardening and botanical publications, sought out new or rare plants, engaged discussions on nomenclature and classifications, and built collections that were not just ornamental but also served as study material[10]. This status depends on recognition from various networks interested in the same plant genera. While knowledge communities in natural sciences are well documented[11], less is known about how these networks operate in the transition from gardening to horticulture in the early

7. Dominique Juhé-Beaulaton, Vincent Leblan, *Le spécimen et le collecteur: savoirs naturalistes, pouvoirs et altérités (XVIII^e^-XX^e^ siècles)* (Paris: publications scientifiques du MNHN, 2018) 7-35.
8. Sarah Easterby-Smith, *Cultivating commerce. Cultures of Botany in Britain and France, 1760-1815* (Cambridge: Cambridge University Press, 2018) 21-119.
9. Louise Couëffé, *Plantes, terrains et cultures botaniques: Herboriser dans l'Ouest de la France au XIX^e^ siècle* (PhD Diss., Université d'Angers, 2023), 8-759; Juhé-Beaulaton, Leblan, *Le spécimen et le collecteur*, 7-35.
10. Easterby-Smith, *Cultivating commerce*, 79-107; Krzyzstof Pomian, *Collectionneurs, amateurs et curieux. Paris-Venise XVI^e^-XVIII^e^ siècle* (Paris: Gallimard, 1987): 179-183.
11. Ann Secord, 'Coming to Attention: A Commonwealth of Observers during the Napoleonic Wars.' In Lorraine Daston and Elizabeth Lunbeck (eds.), *Histories of Scientific Observation (*Chicago: Chicago University Press, 2011): 421-444.

19th century. This study of the Dupont's herbarium offers an opportunity to explore the various actors involved in this process.

The first section focuses on the determination of Dupont's profile. We examine where and how he grew roses in order to highlight the evolution of his gardening practice, from leisure to expertise. The herbarium is thus considered in relation to Dupont's collection of living plants. The second section places Dupont's activity in the context of the emergence of a new quality of interest in the diversity of the *Rosa* genus. We study the points of convergence and divergence between botany and gardening in terms of the choice of plants, propagation practices, vocabulary and meanings of roses' propensity to vary. The herbarium is thus seen as evidence of the circulation of plants and representations in interwoven networks, as well as a source documenting his search for novelties. Conclusion emphasizes the value of Dupont's herbarium, by making claims on its relevance as a collection and its significance in the history of horticulture, of roses, and the history of science.

2. Growing roses: leisure, botany and horticulture

2.1. Dupont's life and garden through upheaval

A few chronological points of André Dupont's biography should shed some light on the conditions under which he became a rose grower. The broad outlines of André Dupont's biography are known, as it was the subject of a book, based on meticulous archive research[12]. André Dupont was born in 1742 in the family of a "valet de chambre" in charge of the daily affaires of several influential figures of the French nobility. He learned his father's profession and succeeded him in the service of the Count of Provence, Louis XVI's brother. He was attached to the service of the Count's Chamber for the maintenance, the making of tapestries and furniture, and daily ceremonial duties. In 1779, when the Count of Provence established his residence in the Luxembourg Palace in Paris, Dupont was promoted as the caretaker of the Palace though he also worked for the postal services of the city. The employment in the postal services became his main professional occupation after the French Revolution.

12. Derkenne, *André Dupont*, 1-252.

In 1785, Dupont rented a plot of land adjoining the Luxembourg building from the Carthusian monks (Les Chartreux) for the purpose of building a private house and creating a garden. After the nationalization of the clergy's property during the Revolution, he attempted to acquire this land, but he could only buy the house and part of the garden. He had to sell this property in 1792, moving back to Luxembourg's outbuildings, while the Palace was used as a prison for two years, after which it became the residence of political institutions. He then rented a house and a garden on Rue d'Enfer (since 1796), still in the neighbourhood of the Luxembourg. In 1799, the Luxembourg Palace was allowed to the Senate. As the garden was the subject of expansion projects for the Senate, Dupont was compelled to move to the Faubourg Saint-Jacques in 1803. He rented there a land for his garden until 1810, before moving one last time to rue Fontaines-Nationales (Fontaine-au-Roi)[13].

Before the 1789 Revolution, Dupont was a middle-class bourgeois[14]. He received a regular income from his office from the Count of Provence (albeit sometimes late in coming), which he supplemented with the employment at the Parisian postal services. His professional duties required attention, rigor, meticulousness, as well as literacy. At the time, gardening was probably a leisure activity for him, in accordance with his bourgeois social status[15]. In his first garden, Dupont grew "trees and the rarest plants for study"[16]. This is relevant information that needs to be related to the precise location of this garden. The Chartreux land near Luxembourg was, before the Revolution, the "most precious collection of fruit trees, indigenous or acclimatized existing in the whole world"[17] and the most renowned nursery in France for its mastery of grafting and pruning techniques[18]. The Chartreux's collection was dismantled in 1796. Many of the trees were destroyed, sold or moved to other nurseries or collections. Some of them were transplanted to the Jardin des Plantes. A new nursery and fruit tree collection was established in 1804 on the same land, and then owned by the government. Both the Chartreux

13. Derkenne, *André Dupont*, 113-174.
14. David Garrioch, *The Formation of the Parisian Bourgeoisie, 1680-1830* (Cambridge, Massachusetts: Harvard University Press, 1996) 1-352.
15. Youri Carbonnier, *Maisons parisiennes des Lumières* (Paris: PUPS, 2006) 274-278.
16. Derkenne, *André Dupont*, 83.
17. Etienne Calvel, *Notice historique sur la pépinière nationale des Chartreux au Luxembourg* (Paris: chez l'auteur, 1804) 7.
18. Charles-François Mathis, Émilie-Anne Pépy, *La ville végétale: une histoire de la nature en milieu urbain (France, XVIIe-XXIe siècle)* (Ceyzérieu: Champ Vallon, 2017) 67.

and Luxembourg's gardeners, with whom Dupont came into contact, were a source of learning about rigorous gardening: precise gestures, concern about distinguishing plants according to their varieties, attention to details. In Dupont's second garden, on rue d'Enfer, the space was smaller, which prevented him from continuing to grow trees. However, he maintained the same spirit, which he applied to the cultivation of roses.

2.2. A botanist-cultivator

Dupont began his rose collection in the second garden, rue d'Enfer, by 1796. Three years later, this collection was already rich and well known. According to Dupont's account, he initially started collecting roses "because he had some leisure time, the need to occupy it, and a taste for botany"[19]. He was planning to write a monograph on roses. These assertions are confirmed by the documents he compiled when he requested authorisation from the Senate to conserve the rue d'Enfer garden, then by the requests and petitions he wrote from 1799 to 1803 to demonstrate the value of his rose collection, for which he was acknowledged. In 1799, four key figures of the time signed a petition in support of Dupont's claim: André Thouin (1747-1824), professor of Cultivation at the Muséum National d'Histoire Naturelle since 1793; Jean Thouin (1756-1827), head-gardener at the Jardin des Plantes; René Louiches Desfontaines (1750-1833), professor of Botany at the Museum. This petition was also signed by Jacques Cels (1740-1805). Cels was un employee in administration, an amateur gardener and amateur botanist before the Revolution. He became a commercial plant grower around 1790, while holding positions in the Ministry of Interior and the Council of Agriculture[20]. The career of each of these signatories resulted from the patronage system at the Jardin du Roi[21] and from opportunities for upward social mobility through administrative positions after 1789. Their intervention on Dupont's behalf shows that he

19. Derkenne, *André Dupont*, 151.
20. Georges Cuvier, "Éloge historique de Jacques-Martin Cels. Lu à la séance publique du 7 juillet 1806" in *Mémoires de la classe des sciences mathématiques et physiques de l'Institut national de France,* T. VII-1, 1806, 139-158.
21. André and Jean Thouin enjoyed the protection of Buffon, Intendant of the Jardin du roi, and Desfontaines from that of the botanist Le Monnier. Emma C. Spary, *Le jardin d'utopie. Histoire naturelle en France de l'Ancien régime à la révolution* (Paris, Publications scientifiques du MNHN, 2005) 62-67.

was involved in a network that could offer him protection and opening for professional and social fulfilment. They testified that the Museum supported him in his project of writing a monograph of roses, providing him with plants, herbaria and books. In exchange, the Jardin des Plantes received from Dupont plants which were missing from the public collections[22].

The status aimed by Dupont was to be recognised as a "gardener-botanist" (*jardinier-botaniste*) or "botanist-cultivator" (*botaniste-cultivateur*). Both terms were used in French in the late eighteenth and early nineteenth centuries to designate gardeners specialising in the propagation of newly described plants[23]. These expressions are somewhat equivocal. While they underline the association between botanical knowledge and cultivation practices, they don't give a true picture of the diversity of botanist-cultivators' situations: gardeners taking part in botanical expeditions; employees of the Jardin des Plantes; nurserymen propagating plants on behalf of this institution, for medicine or for private collections; many "botanophiles" growing rare plants in their private gardens. They were all characterised by their interests in botanical science, the care they took to identify plants and to ensure that each species was grown in conditions as close as possible to their original habitat[24]. Botanists-cultivators had varying degrees of botanical knowledge, but enough to earn the trust of prestigious botanists. They played a key role in the circulation of plants from one part of the world to another, between botanists and between botanical gardens and horticulture. Jacques Cels or the nurseryman Philippe-Victoire Levêque de Vilmorin (1746-1804) fell into this category[25]. Whereas they grew a wide variety of plants, Dupont specialised in the *Rosa* genus.

Dupont's requests and petitions from 1799 to 1803, as well as the testimonies of his allies belonging to learned institutions, insisted on the connection between the living collection and the intellectual work it should support. According to Marc Du Tour, member of the Société d'agriculture de Saint-Domingue and one of the authors of a dictionary of Natural History in 1803, Dupont was the most qualified to write a necessary monography on this genus:

22. MNHN Archives, Chaire de Culture, MS 313, without date (sept.1798-aug. 1801.)
23. Roger L. Williams, *Botanophilia in Eighteenth-Century France: The Spirit of the Enlightenment* (Dordrecht: Springer, 2000) 1-197.
24. Georges-Louis-Marie Dumont de Courset, *Le botaniste cultivateur*, t.V (Paris: JJ Fuchs, 1805).
25. Easterby-Smith, *Cultivating Commerce*, 63-70.

> The rose would require a fairly extensive monograph, written by a botanist-cultivator. No one is in a better position to undertake this work than Mr. Dupont, who has been a passionate lover of the rose all his life, who does not grow any other flowers at the moment, and who has one of the richest collections of this genus in his garden near Luxembourg [26].

This appreciation in such an important publication attests the reputation of Dupont as an expert, above all thanks to his highly valued collection of roses, enhanced by his experiential knowledge on roses cultivation and his ability to involve elements of theoretical botany. Dupont's reputation, further confirmed by mentions in prestigious publications[27], did not protect him from the loss of the rue d'Enfer garden. He nevertheless insisted relentlessly on the disastrous consequences of the relocation: that it would endanger the plants and thus risk wiping out the effort, dedication and money he had invested in this collection over the years.

2.3. An elite rose-grower

After 1803, Dupont appeared more involved in the commercial propagation of roses than in previous years. He reconstructed the rose collection in Faubourg Saint-Jacques and Rue Fontaine-Nationale. He supplied to the Malmaison garden, where the former Empress Joséphine de Beauharnais gathered a great collection of roses, coming from English nurseries (in particular Lee and Kennedy), German, Italian and Dutch gardens, French nurseries and botanical gardens. A few nurseries were involved in receiving and propagating plants for Malmaison[28]. Dupont was one of them. The Malmaison's accounts report the payment of bills to Dupont that may correspond to several hundred rosebushes delivered between 1806 and 1808[29]. He

26. Marc du Tour, "Rosier" in [Deterville], *Nouveau dictionnaire d'histoire naturelle appliquée aux Arts, Principalement à l'Agriculture et à l'économie rurale et domestique*, t . XIX (Paris: Deterville, 1803), 472.
27. Georges-Louis-Marie Dumont de Courset, *Le botaniste cultivateur,* t.III (Paris: Arthus Bertrand, 1802) 336-355; Jean-Claude-Michel Mordant de Launay, *Almanach du Bon Jardinier* (Paris: Onfroy, 1803), 573-588.
28. Daniel Lemonnier, *Le livre des roses. Histoire des roses de nos jardins* (Paris: Belin, 2014) 79-84.
29. Derkenne, *André Dupont,* 162-165. F. Joyaux estimates these deliveries at 2,500-3,000 roses for two years. François Joyaux, *La rose, une passion française 1778-1914* (Paris: Complexes, 2001) 49-64.

probably traded plants more broadly, as he published a catalogue (now lost) around 1809 and several advertisements for the sale of roses[30]. However, commercial horticulture never became his main source of income as he continued to be employed at the postal services until 1814.

During this period, from 1803 to 1814, Dupont's reputation grew steadily. Numerous publications on gardening and botany in France and in Great Britain mentioned Dupont's collection and particularly specimens raised from seeds confided to him by botanists on their return from botanical expeditions. René Louiches Desfontaines referred to Dupont's collection as complementary to the Jardin des Plantes. He praises Dupont's ability to keep alive varieties that were difficult to grow as well as the relevance of his opinions on the classification of the roses[31]. He acknowledged that practical experience and ongoing exchanges with botanists over many years had enabled Dupont to build up unique knowledge of roses.

At the same time, Dupont became a key figure in the emerging networks centered around roses. He was a supplier of the most curious, the rarest and newest roses for collections of roses. The passion for roses was inspired by the sophisticated gardening practices of the *florists* of previous centuries, who had focused on tulips, hyacinths, anemones, tuberoses, narcissi and lilies[32], as a mean to establish their social distinction based on erudition and originality[33]. By the early 19th century, these communities required not only practical gardening skills but also theoretical knowledge in botany. They used terms like *amateurs*, *rose lovers* or *connoisseurs* to distinguish themselves from ordinary rose growers. These were not clearly defined categories, but an internal hierarchy developed, reserving the term *connoisseurs* for the most rigorous and skilful among them. Their collections were driven by both florists' desire for diversity and the botanists' spirit of inquiry. Reputation of Dupont was well-established in these circles:

30. Derkenne, *André Dupont*, 171; *Journal de Paris, politique, commercial et littéraire*, n.º 25, Oct. 25 1811; Mordant de Launay, *Le Bon jardinier* (Paris: Onfroy, 1814).
31. René Louiches Desfontaines, *Histoire des arbres et arbrisseaux qui peuvent être cultivés en pleine-terre sur le sol de la France,* t. II (Paris: Brosson, 1809), 176.
32. Iris Lauterbach, "Commerce and Erudition: Civic self-representation Through Botany and Horticulture in Germany, Sixteenth to Eighteenth Centuries", in *Gardens, Knowledge and the Sciences in the Early Modern Period* (Bâle: Birkhäuser, 2016) 319-341.
33. Elizabeth Hyde, "Flowers of Distinction: Taste, Class and Floriculture in Seventeenth-Century France", in *Bourgeois and Aristocratic Cultural Encounters in Garden Art, 1550-1850* (Washington: Dumbarton Oaks, 2002), 77-100.

> Since Mr. Dupont has decided to cease selling, amateurs who do not have the advantage of being his friends have to regret that they can no longer obtain the species or varieties that would be most pleasing to them. On their behalf and ours, we invite him to abandon a resolution that is detrimental to him and afflicts all amateurs by subjecting them to deprivations of which Mr. Dupont must feel the torments better than anyone else[34].

In 1810, Dupont unsuccessfully sought to donate the rose collection to the Museum and offered his services to take charge of its cultivation at the Jardin des Plantes[35]. Finally, in 1814, while retired from the post office, he managed to reach an agreement with the Senate. He handed over 500 roses to the Luxembourg Garden in exchange for an annual pension. Dupont sold another duplicate of his collection to the nurseryman Louis-Claude Noisette (1772-1849). The same year, he donated the herbarium to the Museum. He ended his collection, roses' propagation and making herbarium simultaneously, a clear endorsement that the project for a monograph, which never materialised, had been completely abandoned as well.

2.4. Herbarium and living collection

About a fifth of the plates of the 232 parts of the herbarium have no labels or handwritten notes. Less than half of them had an indication of a date, and they ranged from 1799 to 1811, with a concentration on two years, 1802 (about 45% of the labels with a date) and 1803 (about 26%), years of relocation of Dupont's gardens. Simultaneously of moving plants from one garden to another, he displaced some of the roses from the living collection to the dry, perennial one. That suggests that the herbarium was a means of compensating the fragility of plants when they were exposed to the risk of loss through transplantation.

However, the herbarium was not a replica of the rose garden. A catalogue of Dupont's collection was published in 1819 by Claude-Antoine Thory as an appendix of a small book in Latin which describes a new species of rose (*Rosa Candolleana).* Thory entitled the appendix: "*Gymnasium Rosarum"* (or school of Roses) and specified that it was a transcription of Dupont's

34. Jean-Claude-Michel Mordant de Launay, *Almanach du Bon Jardinier* (Paris: Audot, 1813), 772.
35. Derkenne, *André Dupont,* 171.

autograph catalogue of the roses he grew in his garden in 1813[36]. This list does not entirely coincide with the herbarium labels. Not all the species and varieties on the catalogue are included in the herbarium and the herbarium contains plants not covered by the catalogue. The catalogue showed the composition of the collection at a given point in time, while the herbarium appears as a kind of journal of the living collection. It recorded movements and events. Many chronological mentions indicated the time of a graft of a rose, keeping a memory of this operation, the time it occurred and the plants it dealt with. The dried specimens might be a means to compare the result of the graft with the original plant, to ensure the conservation of the morphological features of the variety. Sometimes, Dupont mentioned the failure of grafts because of accidental events ("broken by the glass"[37]). Other labels bear the date on which the rose was received by Dupont, and from whom, or the date of blooming. From this point of view, the informative function of the herbarium goes further than the living collection. It records the history of the collection, as well as his attempts and operations made to move, to expand and to diversify it. While the living collection only shows success of gestures, as viable plants, the herbarium also preserves evidence of failures.

3. Roses at a turning point

3.1. A herbarium made for the study of roses?

The herbarium was probably intended as a working tool for the monograph of roses. The first books devoted exclusively or mainly to roses were published in France in 1800[38] and 1804[39], but these modest works, with few illustrations and no botanical rigour, could not compete with the richly illustrated flower

36. Claude-Antoine Thory, "Catalogo inedito quas Andreas Du Pont in horto suo stiduise colebat [*Sic*] anno 1813, Cum figura aenea picta", in *Rosa Candolleana seu Descriptio Novae Speciei Generis Rosae, Dicata Pyr.-Aug. De Candolle, A Cl.-Ant. Thory, in prima parisiorum cititatis circumscriptione aedili vicario, addito* (Paris: Apud D^{am} Hérissant le Doux, 1819), 13-19.
37. MNHN ROSA-Vieil herbier de roses.
38. Jean-Louis-Marie Guillemeau, *Histoire naturelle de la Rose* (Paris: Vatar-Jouannet, 1800) 1-340.
39. Pierre-Joseph Buch'oz, *Monographie de la Rose et de la Violette* (Paris: Chambon, 1804) 1-272.

books that had been fashionable since the middle of the 18th century[40], nor satisfy the expectation of connoisseurs. They were much more present in England, with the successful engravings produced by Mary Lawrance for the Royal Society between 1796 and 1799 and published under the title *A Collection of Roses from Nature* for a wealthy public[41], or the publication in 1805 by Henry C. Andrews of a series of fascicles alternating botanical descriptions and illustrations, entitled *Roses or a Monograph of the Genus Rosa*[42]. This last publication attested a close link between living collections, nurserymen and botanists. It was a means of advertising for nurserymen, as they intended to display possible collections, or to bring together in printed form roses cultivated in different collections; as well as an instrument to study roses. The author realised drawings made "after nature", i.e. according to an ideal representation of the characteristics of each taxon[43], based on the observation of plants cultivated in nurserymen's collections. The addition of both figurative representation and written description, which broadly respected the formal rules of botanical illustration and description, reconciled aesthetic appeal and instruction, botanical and ornamental interest.

Such a publication was strongly expected by a wealthy public interested in roses in France, as the famous monograph *Les Roses* published in 1817 by the connoisseur Claude-Antoine Thory (1757-1827) and the painter Pierre-Joseph Redouté (1759-1840) stressed it. Rose collectors wished a work providing them with "the means to recognise, at first glance, the various individuals in their collections", which could "compensate for the inadequacy of most of the descriptions found in botany books [...] generally intelligible only to those who are already familiar with the object described"[44]. This audience partly corresponded to connoisseurs who formed Dupont's network of relations and customers since the late 1790, when he began his project of monograph.

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40. Williams, *Botanophilia in Eighteenth Century France*, 141.
41. Mary Lawrance, *A Collection of Roses from nature* (London: Published by Miss Lawrance, teacher of Botanical Drawing, 1799), 1-91. A similar work was published in Leipzig by K.G. Rössig, with botanical descriptions and drawings, intended to be useful to botanists and to amateurs wishing to make a selection for the embellishment of their gardens, as well as to those whose sole aim was to exercise their observation skills. Carl Gottlob Rössig, *Les Roses dessinées et enluminées d'après nature, avec une courte description botanique, par M. le Dr Roessig* (Leipzig: au Comptoir de l'Industrie, 1801-1817) 1-161.
42. Henry Cranke Andrews, *Roses. Or a Monograph of the Genus Rosa, containing Coloured figures of All Known and Beautiful Varieties* (London: Richard Taylor, 1805-1828) 1-129.
43. Lorraine Daston, Peter Gallison, *Objectivité* (Paris: Les presses du réel, 2012) 120-130.
44. Pierre-Joseph Redouté, Claude-Antoine Thory, *Les Roses* (Paris: Didot, 1817-1824) I, 20.

Connoisseurs sought to provide their way of cultivating with instruments of knowledge that corresponded to their tastes, abilities and interests, different from those of botanists. Botanical treatises were interested in the description and classification of the genus *Rosa* but paid attention only to species, i.e. single-flowered (with five petals) spontaneous roses: they considered double and full-flowers unworthy of scientific study, plant monsters that only cultivation could keep alive for the sole purpose of ornamental pleasure[45]. On the contrary, the descriptions, nomenclature and classifications given in the illustrated monographs on roses were intended to satisfy this expectation, as they included both botanical and garden roses. The world of botany and that of connoisseurs did not merge completely, but they had more points of common interest than before, and Dupont's position at the crossroad of botanical, nurserymen, gardeners and connoisseurs' networks made him a convenient candidate to write this kind of work.

Dupont had the collection, the basic botanical knowledge and a clear understanding of what connoisseurs expected. What he was probably missing was one of the ingredients of a monograph: the drawing. It seems quite possible that the herbarium was intended to replace the skills of botanical drawing or the services of a draughtsman. Herbaria were used in botany to study in the long-term, without the constraints of the plant living time, the morphological characteristics of flowers, leaves, or stems. The comparison of those characteristics between plants enabled them to distinguish species and varieties from one another, and to classify them into groups according to their similarities[46].

Dupont's herbarium keeps tracks of this kind of work, showing that he was concerned about classification. He brought together several specimens in files bearing labels dedicating it to a species, such as *Rosa canina*, *Rosa centifolia* or *Rosa lutea*[47], and sometimes noted the erroneous attribution of a plant. To facilitate this, he used loose sheets of paper, which could easily be insert in the collection or moved to change the order of the plates according to criteria of classification, a method popularized in the second half of the

45. Jean-Baptiste Lamarck, Augustin Pyramus de Candolle, *Flore française ou descriptions succinctes de toutes les plantes qui croissent naturellement en France*, t. 1, 3.e éd. (Paris: Desray, 1815), 136.
46. Bourguet, Lacour, "Les mondes naturalistes: Europe (1530-1802)", 256; Alexandra Cook, "Plant Technology and Science", in *A Cultural history of plants in the seventeenth and the eighteenth Century - Vol. 4*, eds. Jennifer Milam (London, New York: Bloomsbury Academic, 2023) 102-106.
47. MNHN ROSA - Vieil herbier de roses.

18th century by Linnaeus[48]. As recommended by botanists, Dupont used for some specimen Latin nomenclature, and put labels on the folders, which were supposed to give a quick overview of the content of the collection to make it easier to consult and to expand in an orderly way[49]. Those characteristics suggest that he probably intended to produce a classification that covered both botanical and garden roses for his monograph.

This hypothesis is however tempered by the irregularity of the plates and labels of the herbarium. While botanists valued the use of Latin nomenclature following the Linnaean system, which facilitated the communication on taxa and classifications, many files contained plants or identified by the vernacular name or a mixed of Latin and French nomenclature ("n.º 194 Maxima Rose pâle La Hollande Varin", "Gallica sans épine Lilas et blanc remouleur", "centfeuilles jumelle"). Other plates gathered on the same sheet of paper many plants assigned to different species, what impeded their differentiation and material classification in the collection. Finally, some plates contained separate organs (leaves, petals) that appeared to have been arranged so that they could be compared, but without any indication of the species to which they belonged (Figure 1).

Figure 1. Plate with different roses, unlabelled. MNHN Rosa-Vieil herbier de roses © V. Malécot.

48. Fleischer, "Leaves on the Loose: the Changing Nature of Archiving Plants and Botanical Knowledge", 131-133.
49. Bourguet, Lacour, "Les mondes naturalistes", 266; Staffan Müller-Wille, "Linnaeus' herbarium cabinet: a piece of furniture and its function" in *Endeavour*, vol. 30 (2006) 60-62. https://doi.org/10.1016/j.endeavour.2006.03.001

The classification was not the only function of the herbarium. The collection could be used to accompany and sharpen the cultivator's sense of observation and differentiation. Overall, Dupont's interest seemed to lie not in the species, but in the varieties, by which botanists used to describe the level below the species in the organisation of the genus *Rosa*. This category was in the process of acquiring a new and peculiar meaning for connoisseurs (different from the sense of variety in botany), while they searched for increasing diversity. The introduction of new roses, and ability of roses to vary, made them a convenient plant for the assiduous search for novelty, which cultivators described as "improvement"[50]. This launched horticulture, and roses became in twenty years, between 1790 and 1815, the most intensely selected, commercialized and collected garden plant[51].

3.2. Diversification by introduction. New roses from overseas

Roses have been grown since ancient times and decorating gardens since the Renaissance. They were exclusively double or full-flowered roses (with a large number of petals) belonging to a few classes: Gallica (Provins), Centifolia (Cabbage Rose), Damas. By the end of the 18th century, roses from Asia and North America were imported in Europe. Those roses aroused interest among botanists regardless of whether they were cultivated or spontaneous in their region of origin, because they all had to be described and integrated in botanical classifications. For the connoisseurs, collectors and botanist-cultivators, practicing a sophisticated and educated gardening, these new roses were a means to increase the diversity of roses in gardens. While the division between savage and cultivated had become less radical[52], collectors brought together the most widely differing roses, as well botanists' roses as garden roses.

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50. Sarah Tarlow, *The Archaeology of Improvement in Britain 1750-1850* (Cambridge: Cambridge University Press, 2007), 16.
51. Cristiana Oghină-Pavie, "Représentation de la diversité des rosiers au XIXe siècle", *Bulletin d'histoire et d'épistémologie des sciences de la vie*, 2, vol. 23 (2016) 155. https://doi.org/10.3917/bhesv.232.0153
52. Pascal Duris, "Nature et art au XVIIIe siècle. À propos de la *Théorie des jardins* (1776) de Jean-Marie Morel", *Bulletin d'histoire et d'épistémologie des sciences de la vie,* 14, vol. 1 (2007), 7-23. https://doi.org/10.3917/bhesv.141.0007

According to the labels in Dupont's herbarium, he received roses from botanists, nurserymen, connoisseurs and other correspondents whose status is still unknown. Labels provide only slight hints as to the possible trajectories of the plants. On some plates, Dupont wrote down toponymic indications. Depending on the plant concerned and the additional information briefly written on the same plates, toponyms could have different significance. For example, four plates indicate "Ratisbonne" (French name of Regensburg in Bavaria). On one of them, Dupont wrote the name under which he received the plant and added another name attributing it to another species ("China simple, received from Regensburg as Rubiginea flore albo"[53]). On other plates, he mentioned "savage near Regensburg". This suggests that the roses originated from a collection in Bavaria. In other cases, Dupont wrote "Holland"[54] which does not refer to the origin of the plant but to a variety, in this case a Cabbage rose also known as "Great Holland Rose". Several vernacular names suggest a British origin: "Rosa Mundi", "Hedgehog Rose", "Bishop", "Maiden-Blush", but they might also have passed through other collections. Latin names naturally do not convey much in this respect.

A plate (Figure 2) contains six branches of a rose tree and three labels as follow: "sample raised in the glasshouse, whole tree donated by Olivier"; "graft of simplicifolia ready to bloom the same year, graft broken by accident in the glass cage September 1809"; "flower of the graft made at my place flowered in 1801"[55]. *Rosa simplicifolia* Salisb. (also named *Rosa berberifolia* Pall., *Rosa persica* Michx., *Lowea berberifolia* Lindl.) was a highly curious plant[56]. Seeds were first brought to Europe from the Middle East in 1785 by the botanist André Michaux, given to the Jardin des Plantes and to Kew Garden. A second introduction from Persia was made in 1792 by Guillaume Antoine Olivier (1756-1814), who travelled as a botanist for the Museum[57]. The morphology of *Rosa simplicifolia* was a problem for botanists, being

53. MNHN ROSA - Vieil herbier de roses.
54. MNHN ROSA - Vieil herbier de roses.
55. MNHN ROSA - Vieil herbier de roses.
56. John Lindley, *Rosarum monographia, or, a Botanical History of Roses* (London: J. Ridgeway, 1820) 2.
57. Guillaume-Antoine Olivier, *Voyage dans l'Empire Othoman, l'Egypte et la Perse*, t.V (Paris: Agasse, 1807) 185; Bernard Paul, "Le voyage dans l'Empire ottoman, l'Égypte et la Perse de Guillaume-Antoine Olivier, naturaliste et envoyé de la République (1792-1798)", *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, 141e année, no. 4 (Paris: de Boccard, 1997) 1163. https://doi.org/10.3406/crai.1997.15811

Figure 2. *Rosa simplicifolia* (*Rosa persica*). MNHN Rosa-Vieil herbier de roses. © V. Malécot.

the only species in the genus *Rosa* with simple leaves. The absence of stipules raised the question of the discriminatory value of this character for the diagnosis of the genus and, consequently, the possible metamorphosis of this organ[58]. In addition, this rose seduced the connoisseurs by the original flower, of an intense yellow colour, with a dark crimson spot in the center. However, it was very rare as "it resists cultivation in a remarkable manner, submitting permanently neither to budding, nor to grafting, laying, striking from cuttings; nor, in short, to any of those operations, one or other of which succeed with other plants"[59]. Thory and Redouté still insisted in 1817 on the difficulty of cultivating this rose: "all amateurs have lost the plants they owned, and the few remaining roses on their own roots are generally weak and languid"[60] (Figure 3).

Dupont's herbarium attests that he propagated this rose by grafting, whereas it would have been quite appropriate to only use seed propagation

58. In 1824, the Belgian botanist Dumortier created a separate genus, *Hulthemia,* of which it is the only species. Barthélemy-Charles Dumortier, *Notice sur un nouveau genre de plantes: Hulthemia. Précédé d'un aperçu de la classification des roses* (Tournay, 1824) 1-10. Since 1888, *Rosa subgenus Hulthemia* Focke.

59. John Lindley, "Lowea berberifolia-Barberry-leaved Lowera", *Edward's Botanical Register, or Ornamental flower-garden and Shruberry,* Vol. XV (London: James Ridgway, 1829), 1261.

60. Pierre-Joseph Redouté, Claude-Antoine Thory, *Les Roses* (Paris: Didot, 1817-1824) I, 28.

Figure 3. *Rosa berberifolia*-Rosier à feuilles d'épine-vinette. Pierre-Joseph Redouté, Claude-Antoine Thory, *Les Roses* (Paris: Didot, 1817-1824) I. © Biliothèque Nationale de France (Gallica).

if he had intended it solely for botanists. Seedlings were used in botanical gardens exchanges, as they were more convenient to transport, and also as spontaneous species vary only rarely by seeds. The specimen of *Rosa simplicifolia* in the Jussieu herbarium at the Muséum National d'Histoire Naturelle is labelled: "Rosa simplicifolia flowered at Dupont's and given by him in 1812"[61]. There are no roots or signs of grafting on this specimen. It

61. *Rosa persica* Michx., Herbier Jussieu, spécimen P00667268, Muséum national d'Histoire naturelle, Paris (France), Collection : Plantes vasculaires (P) - http://coldb.mnhn.fr/catalognumber/mnhn/p/p00667268

is possible that Dupont used grafting and seedlings in parallel, to increase the chances of survival of a plant that was so difficult to grow and so much in demand.

The herbarium plates show that botanical and gardening practices overlap in a composite collection such as that of Dupont's. Rose seedlings were also used when gardeners sought to obtain new roses, which they then propagated by grafting.

3.3. Diversification by variation. Observing, comparing and catching novelties

The composite collection Dupont gathered in his garden was suitable for crossed fertilization, stressing the high potential of roses for diversification. In cultivated roses, generation by seed induces dissimilarities in all the organs: morphology and colour of the foliage, colour or shape of the flower, etc. This phenomenon, well known to gardeners, means that roses whose general appearance was to be preserved were propagated vegetatively (i.e. without sexual reproduction), by grafting or cutting[62]. Variability also manifested in what gardeners called "accidents", monstrosities or "plays of nature" (*lusus naturae)*[63]. If decorative, these alterations can be preserved by grafting.

There is very limited information on the first sowings expressly intended to enrich the cultivated diversity of roses. Around 1800, Dutch plant merchants began selling novelties raised by seeds, all belonging to the same species, *Rosa gallica*. The French nurseryman Jean-Louis Descemet (1761-1839) started systematic sowing in 1803-1804[64]. From 1811 onwards, gardening treatises gave advice on how to enhance natural cross-fertilisation to increase the chances of variation[65]. This property was extremely valued in the search for diversification, and made roses highly attractive.

The notion of the horticultural variety was defined at the very same time, as a corollary to this new approach. For horticulturists, a variety of rose was

62. Cloning, in today's terms.
63. Mutations, in today's terms.
64. Jean-Pierre Vibert, *Observations sur la nomenclature et le classement des Roses, suivies du catalogue de celles cultivées par J.-P. Vibert à Chennevières-sur-Marne* (Paris: Madame Huzard, 1820), 10.
65. Thomas Guerrapain, *Almanach des Roses, Dédié aux Dames* (Troyes: Gobelet, 1811), 22; Jean-Baptiste Lelieur de Ville-sur-Arce, *De la culture du rosier avec quelques vues sur d'autres arbres et arbustes (*Paris: Didot, 1811), 48-77.

an individual, different from the others, resulting from sowing or accident, and propagated vegetatively. The word "variety" borrowed from botanical vocabulary acquired a different meaning in horticulture. It refers to a sum of identical individuals, not a plant population. The quality of a "new" or "different" variety resides in the comparison between individuals. It lies in details of morphology, colours, smell or blooming, that botanist considered as trifling and insignificant. The varieties were named using either fantasy names ("Bishops", "Grand pompon") or Latin names ("sulphurea nana flore pleno"), in the latter case being difficult to distinguish whether they are botanical or horticultural varieties.

Morphological alterations (Figure 3) are particularly numerous in the herbarium, whereas they are exceptional phenomena in the wild and in gardens. Hence the proliferous roses ("Rose Gigogne" in French, Childing Rose in English), where the sepals are transformed into leaves and a floral stem. They belong to many species (*Rosa centifolia, Rosa gallica, Rosa indica, Rosa spinosissima*). The explicit seeking of morphological alterations can be attributed to the culture of monsters and other strange things, developed among amateurs[66]. They were also of interest to botanists who interpreted the production of monsters as accidental evidence of the hidden functioning of living organisms[67]. Proliferous roses were an object of investigation in the so-called metamorphosis of plants, supporting the hypothesis of the existence of a unity in nature between the leaves and the floral parts, in their derivation from a unique prototype organ[68]. Dupont's observations were not limited to these flagrant changes in morphology. Many plates presented alteration in shape and number of petals, glandular hairs, spines, leaves, leaflets, hips, etc. To observe them, he had to possess an excellent knowledge of the usual, or normal, shape of the organs for each species.

66. Spary, *Le Jardin d'utopie. L'Histoire naturelle en France de l'Ancien Régime à la Révolution*, 148-150; Cristiana Oghină-Pavie, "Rose and Pear Breeding in Nineteenth Century France: the Practice and Science of Diversity" in *New Perspectives in the History of life Science and Agriculture*, eds. Denise Phillips, Sharon Kingsland (Heidelberg: Springer, 2015) 59.
67. Charles T. Wolfe, "L'anomalie du vivant. Réflexions sur le pouvoir messianique du monstre", *Multitudes*, vol. 33, no. 2 (2008) 53-62. https://doi.org/10.3917/mult.033.0053.
68. Stéphane Schmitt, *Histoire d'une question anatomique: La répétition des parties* (Paris: Publications scientifiques du Muséum, 2004), 87-89; Stéphane Schmitt, "Type et métamorphose dans la morphologie de Goethe, entre classicisme et romantisme", *Revue d'histoire des sciences*, t. 54, no. 4 (2001) 495-521. https://doi.org/10.3406/rhs.2001.2135.

Figure 4. Morphological alterations. Labels: "Foliaceous Gallica", "Proliferous China", "Foliaceous Centifolia", "Twin Unique". MNHN Rosa-Vieil herbier de roses. © V. Malécot.

Dupont paid the same attention to variation in garden roses, adding remarks on colour, fragrance or blooming, whether they concerned common varieties or ones newly arrived in France. The record of non-morphological criteria was frequent in Dupont's herbarium, contrary to botanical herbaria where they were rare. They were not preserved by desiccation, hence the more detailed descriptions on the labels. Description of variation are particularly detailed concerning the flower: petals with a slightly lighter shade, more pinkish or purer white, smaller, bigger, uneven or lanceolate, a trace of variegation, etc. Aesthetic appreciation ("beautiful pink of the petals", "nicely indented foliage", "very nice"[69]) and information on success or failure of grafting prove that he recognised the decorative value of these variations and spread them.

The plants preserved in the herbarium appear to be intermediate milestones between the moment when they aroused the cultivator's curiosity and the materialisation of his quest for variation in a new variety of roses. Dupont focused his attention on the most tenuous alterations, which he propagated without any *a priori* judgement of their value. On a plate comprising three little leaves, he noted "What will I get from these grafts? I don't know, but I hope"[70]. Whether it was intuition, experience or the advice of a botanist, he saw in any change a potentiality for variation induced by cultivation. In

69. MNHN ROSA - Vieil herbier de roses.
70. MNHN ROSA - Vieil herbier de roses.

such a large collection, where species and varieties were brought together in a small space, he unintentionally created the conditions for cross-breeding and hybridisation. Unlike Antoine-Nicolas Duchesne's work on strawberry plants[71], there is no indication of any genealogical reasoning, nor any clearly formulated question about the constancy of species and changes through generation, under the influence of the cultivated state.

Little is documented about the reasoning, the choices and the practical steps he took to grow those eye-catching roses. Emphatic formulas turned his know-how into a kind of wonder: "He is an enchanter who submits the Rose to his magic wand and forces it to undergo the most surprising and pleasant metamorphoses"[72]. More soberly, the British botanist John Lindley wrote: "This very singular and beautiful variety (…) has been raised by the industry of M. Dupont"[73]. The word "industry" suggested the skills, hard work and cleverness[74] of Dupont applied to produce new varieties. Dupont did not set out in writing the aims he was pursuing nor the precise procedures for achieving them. The herbarium sheds some interesting, but still uncertain, light on it. Dupont paid a sustained and continuous attention to differences, and the ability to cultivate them. Once unordinary roses were noticed by him, they became part of the circuits of the collections. They entered the scholar world, mobilising other forms of curiosity, where they were discussed in relation to fundamental inquiries as generation, monstrosities or limits of variation within species.

3.4. Horticultural variations and botanical taxonomies

Botanists and connoisseurs from the early 19th century made numerous references to varieties that had been observed for the first time in Dupont's collection or obtained by him. Botanists were also increasingly interested in the phenomena of variation, but not in the same spirit as gardeners. The genus

71. Antoine-Nicolas Duchesne, *Histoire naturelle des fraisiers* (Paris: Didot-Panckouche) 1766, 1-471.
72. *Journal de Paris, politique, commercial et littéraire*, no. 25, Oct 25, 1811, 1.
73. John Lindley, "Rosa moschata var. nivea", *The Botanical Register Consisting of Coloured Figures of Exotic Plants,* vol. X (London: James Ridgway, 1824), 861.
74. Oxford English Dictionary – Historical Thesaurus – Industry (noun) [https://www.oed.com/]

Rosa was reputed to be challenging for them. Linnaeus considered 12 species of roses and noted "I think that nature plays at mixing several [species] to make one"[75]. Since Linnaeus until the early 19th century, the difficulty of the genus has been compounded as much by newly described species, as well as by the rival classification principles[76]. The dividing line between species and variety in the hierarchy of classifications was particularly arduous. The lack of consensus about the genus *Rosa* surrounded the constancy or the variability of the most relevant features for classification (the shape of the fruit, weld of the styles, spines, hairs, etc.). Some roses included in Dupont's collection and phenomena he observed provided elements of botanical inquiry in that respect, which partly made his reputation in the botanical world.

The proliferous roses and the ornamental varieties were not the main roses that earned Dupont's reputation. They were not the most discussed in the literature of the time. The discrepancy between the written sources and the herbarium is instructive in this regard, and can be illustrated by the case of *Rosa centifolia:*

> The Centifolia Rose or Common Rose: it has never been found in the wild. M. Dupont, having seen a plant from which some flowers had only a small number of petals, obtained seeds which gave him this single-flowered rose. It is a distinct species, although it is not known in which country it grows naturally[77].

This single-flowered *Rosa centifolia* was of interest to botanists because it was the first case of the loss of duplicate of petals by sowing in *Rosa centifolia* roses, interpreted as a return to the type (the primitive morphology) in a species known until then only in the cultivated state, with double flowers[78]. Dupont's herbarium does not contain this single-flowered rose, but a semi-double-flowered one, i.e. a term that refers to an indeterminate number of petals, somewhere between single (five petals) and full flowers (twenty, thirty or even more than a hundred petals). Keeping semi-double *Rosa centifolia* was not for ornamental purposes, but he obviously used it as seed-bearer.

Moreover, some of the roses he cultivated raised botanical controversies in classification. A rose grown by Dupont was named *Rosa moschata var.*

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75. Carl Linnaeus, *Species Plantarum,* t.1 (Holmiae: Laurentii Salvii, 1753), 491-492.
76. John S. Wilkins, *Species. The evolution of the Idea* (Boca Raton: CRC Press, 2018), 88-92.
77. Desfontaines, *Histoire des arbres et arbrisseaux,* 176.
78. Jean-Baptiste Lamarck, Jean-Louis Marie Poiret, *Encyclopédie méthodique. Botanique.* Tome VI (Paris: H. Agasse, 1804), 276.

nivea[79]. No plants matching this name, or its description, have been kept in the herbarium, but Dupont gives the following description of a semi-double rose:

> Tree rose with white semi-double flowers in panicles and very small smooth fruit grown in the gardens of Ispahan. Habitat China. Leaves of Rosa arborea. Raised from seeds brought as fruit by Olivier, sown and raised in the summer of 1802. 2 opposite leaflets, 4 alternate, dark green above, purple glaucous below, saw-toothed. Spiny petioles glandular with small peduncle as well as leaflet margins. The alternate leaflets are accidental. 3 grafts made in 7 February 1802 and the end of August 1803[80].

This description shows a good use of descriptive botanical vocabulary and a taxonomic identification (as *Rosa arborea*), both reproduced almost identically in publications of the time[81]. It is also noticeable that Dupont observed a discreet variation in morphology, which he attributed to an accident and sought to preserve through grafting. *Rosa moschata var. nivea* could be a seedling of this one. It has generated endless classification controversies. John Lindley hesitated to classify it as a variety of *R. arvensis* or *R. moschata*, from which it differs in appearance. He saw in this rose an example of alteration by seeds, "under unnatural and artificial circumstances" by which gardeners maintain anomalous individuals in a living state: "with which science has no concern", except as far as they may indirectly explain the obscure operations of vegetation[82]. Later, botanist Alfred Déseglise (1823-1883) classified it as a distinct species, dedicated to Dupont as *Rosa Dupontii*[83] and François Crépin (1830-1903) hypothesised a hybrid of uncertain origin[84].

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79. Auguste de Pronville, *Nomenclature raisonnée des espèces, variétés et sous-variétés du genre Rosa* (Paris: Mme Huzard, 1818) 92-93.
80. MNHN ROSA - Vieil herbier de roses.
81. Marc Du Tour, "Rosier", *Nouveau dictionnaire d'histoire naturelle appliqué aux arts,* eds. Société des naturalistes et d'agriculteurs, t. XX (Venise: Pezzana, 1808), 253.
82. Lindley, "Rosa moschata var. nivea", 861.
83. Alfred Déseglise, *Essai monographique sur cent cinq espèces de Rosiers appartenant à la Flore de France (*Angers: Cosnier et Lachèse, 1861), 18.
84. François Crépin, "Primitiae Monographiae Rosarum. Matériaux pour servir à l'histoire des Roses", *Mémoire de de la Société Royale de Botanique de Belgique,* t. XVIII, Première partie (Bruxelles, siège de la Société, 1879), 305.

4. Conclusion. Originality and significance of Dupont's herbarium of roses

There may be several converging or successive reasons that led Dupont to make a herbarium: to prepare writing project, to memorise plants lost when the living collection was moved, to record cultivation techniques, or to capture transient alterations. Dupont was as attached to the herbarium as he was to his collection of living roses, since he was equally keen to entrust both to places where they had a chance of being preserved. The rose garden at the Jardin du Luxembourg went on to become one of the most famous in Europe, under the care of the director, Julien Alexandre-Hardy (1787-1876), who enriched and developed it until 1856. In the *Muséum National d'Histoire Naturelle*, Dupont's herbarium did not join the main botany collection. It has been preserved in the collection of departments specialised in cultivated plants. The connection with its origin and author was lost until recently. In comparison with the Muséum's main herbaria, Dupont's still stands as a minor object. What makes this herbarium so disconcerting is its uniqueness. To our knowledge there is no other herbarium of this type.

Identifying the author was a prerequisite for giving it historical significance. The contextualisation we have provided here reassesses its value.

In the study of plant collections, Dupont's herbarium enriches our understanding of the heterogenous appropriation of herbaria as tools mobilised in a variety of ways to complement other collection of natural objects and to compensate for the fragility of living plants[85]. The standardisation of herbarium production became common in amateur botanical circles during the 19th century. However, this was never the case for all herbarium makers, since preserving dried plants often served purposes other than scholarly knowledge. For instance, some herbaria were intended to keep a record of a visit to a place, commemorate an event or capture an emotion. Evaluating this kind of herbaria solely based on conformity to botanical standards or not is a misleading line of enquiry, as it obscures the other components of practices from which the herbarium originated.

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85. Bange, "Les collections botaniques privées en France au XIXe siècle", 179-198; Guy Ducourthial, *La botanique selon Jean-Jacques Rousseau* (Paris, Belin, 2009), 129-16; Susan M. Pearce, *Museums, Objects and Collections. A cultural study* (Washington: Smithsonian Books, 1993; Leicester University Press, 1992), 88-89.

In Dupont's case, the informational value of the herbarium lies in its contribution to the history of horticulture. It highlights the key role played by botanist-cultivators as mediators between botanical gardens and trade. Dupont's skills about roses, entangled with knowledge in botany, his ability to catch and observe curious phenomena in roses variation, made him an intermediary character between botany and gardening. The herbarium testifies to this double affiliation by the origin of the plants and by the changes they underwent in his collection, both intellectually and materially. He was also a skilled grower, capable of sowing roses albeit to preserve species characteristics for botanists and propagating decorative roses by grafting for gardens. In the emerging context of a new and mixed approach to roses, he was best placed to play a pivotal role between these two related worlds. This illustrates the connoisseurship characteristics in the particular area of rose cultivation.

For rose history, this herbarium documents the emergence of the horticultural regime of roses in an original way that completes and clarifies the written and iconographic sources. It records name changes and cultivation operations (crossbreeding, grafting), successful or not, that accompany the movement of roses between botanical collections and those of connoisseurs. Many plants preserved in Dupont's herbarium have disappeared from living collections. Others, maintained by vegetative propagation, still exist, but there is uncertainty about the link between plants and the names they bear. The physical preservation of dried organic material allows, in principle, the possibility of genetical comparison with DNA extracted from living roses. The use of herbaria in the study of biodiversity is already a common practice but the efficiency of DNA extraction depends on species characteristics, drying methods and additional treatments[86]. If our ongoing experimentation proves conclusive, it will enable us to examine the question of transmission of genetic heritage (supposedly without variation) through vegetative propagation. This may open the opportunity to assess more precisely the contribution in the selection of ornamental roses of some species poorly preserved in living state (*Rosa damascena, Rosa moschata*) as well as to better understand the effects of crossbreeding between the European gene pool and introductions from Asia at the end of 18th century and begging of 19th century.

86. Lenka Záveská Drábková, "Herbarium Specimens: A Treasure for DNA Extraction, an Update", *Molecular Pant Taxonomy. Methods in Molecular Biology*, n.º 2222 (2021): 69-88. doi: 10.1007/978-1-0716-0997-2_4. PMID: 33301088.

For the history of science, which is interested in the role of practitioners in the construction of the epistemic space of heredity[87], this herbarium alone cannot clarify Dupont's understanding of the phenomena of variation in plants. The herbarium attests to a practice that focuses on the morphological changes in roses. Observation, gestures, repetition, expectation are a kind of investigation[88]. However, there is no evidence of experimental reasoning on generation in Dupont, as in Koelreuter and Duchesne before him, Gallesio or Sageret later[89]. It is variation for itself which attracts his interest, in a spirit consistent with the horticultural concern for the diversity of roses. The herbarium and other information about Dupont shed light on the way in which social position and relations with learned communities led to the circulation of plants between different areas of knowledge. Plants issued by Dupont's practice joined amateur collections, trade, gardens as well as botanical collections. Some of them were thus interpreted as evidence of the transmission of acquired characters or, in contrary, of a return to the primitive fixed forms of the species. Thanks to the interwoven networks to which Dupont belonged, plants were visible, available as objects of collection and scientific examination, and could be mobilised within different theoretical frameworks. Dupont's herbarium opens up new perspectives for analysing the transfer of knowledge through plants and practice in the construction of the fundamental issues of variation.

87. Staffan Müller-Wille, Hans-Jorg Rheinberger, "Heredity – The Formation of an epistemic Space", *Heredity Produced. At the Crossroad of Biology, Politics and Culture, 1500-1870*, eds. Staffan Müller-Wille, Hans-Jorg Rheinberger (Cambridge Massachusetts, London: MIT Press, 2007), 9.
88. Pamela H. Smith, "Making as Knowing: Craft as Natural Philosophy" in *Ways of making and knowing: the material culture of empirical knowledge*, eds. Pamela H. Smith, Amy R. W. Meyers & Harold J. Cook (New York City: Bard Graduate Center, 2014), 19.
89. Marc J. Ratcliff, "Duchesne's Strawberries: between Grower's Practices and Academic Knowledge", in *Heredity Produced. At the Crossroad of Biology, Politics and Culture, 1500-1870*, eds. Staffan Müller-Wille, Hans-Jörg Rheinberger (Cambridge Massachusetts, London: MIT Press, 2007), 205-228.

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