Banking, Botany, and *Bibliothéconomie*: On the Science of Keeping the Books

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Quand les matériaux sont imparfaits, l'édifice ne peut pas être complet
— Constantine Samuel Rafinesque, *Florula Ludoviciana; or, A Flora of the State of Louisiana* (1817)

On the ledger and the herbarium: the settling of financial and botanical accounts.

> *Pour savoir celles qui nous manquent, il faut connoître celles que nous possédons. C'est le seul moyen de nous entendre avec nous-mêmes et avec nos correspondans*
> — Dominique Villars, *Mémoire sur les Moyens d'Accélérer les Progrès de la Botanique* (1810)

From the perspective of the twenty-first century, the age of digital media and TCP/IP protocol architecture, the 1989 discovery of the manuscript of Jules Verne's *Paris in the Twentieth Century* (1863) in a locked safe perhaps appears more dramatic than the unpublished novel's retrospectively tepid dystopian prophecies.[1] Yet its narrator Michel Jérôme Dufrénoy's employment in the banking house of Casmodage et Cie. provides unexpected insight into what it meant to keep the books in nineteenth-century France. The novel is set in a Paris of the 1960s, when literary culture was the object of scorn when it was not unregretfully forgotten. But like so many visions of the future, Verne's is a skeptical portrait of his own time. Michel is met with taunts and sarcasm when he receives first prize for Latin verse upon completing his studies with the Société Générale de Crédit Instructionnel. This vast apparatus had no fewer than 157,342 students, to whom information was imparted by mechanical means, most all of them receiving instruction in science, technology, and the instruments of finance.

The Société's organizational structure prepared the young poet Michel for the society he was about to enter, howsoever reluctantly. Reasoning on its illiberal essence, he asked, had not construction firms, investment companies, and government-controlled corporations been devised when it became desirable to remake a new France, and a new Paris? "Now, construction and instruction are one and the same for businessmen, education being merely a somewhat less solid form of edification."[2] Founded in 1937 during the reign of Napoleon V, the Société was a singularly Napoleonic institution, "in which every branch of the tree of knowledge might flourish, it being the State's responsibility, moreover, to pollard, prune, and patrol such growth to the best of its ability."[3] How severely the tree had been pruned and straightened becomes evident when Michel seeks to pluck from it sumptuous fruits. He spends a day wandering the (once) great bookstores of Paris seeking the works of Victor Hugo and Honoré de Balzac. Instead he finds copies of *A Practical Treatise for the Lubrication of Driveshafts* and for poetry the *Decarbonated Odes*.

Unresigned to the dictates of the subliterary marketplace, he finds his way to the Imperial Library, its building amazingly enlarged, extending along the rue de Richelieu from the rue Neuve-des-Petits-Champs to the rue de la Bourse. All roads seemingly led to the Bourse. The spirit of the *grands écrivains* had quit the premises, the library housing instead fabulous quantities of recently published scientific works, which were still not enough to meet current demand. "The nine hundred volumes bequeathed by Charles V, multiplied a thousand times, would not have equaled the number now registered in the library."[4] It was in fact the relentless labor of registration, of keeping the books, that was to become Michel's self-effacing task at the house of Casmodage. Having demonstrated his willful carelessness in operating Machine Number Four (a calculator), even after having been "kept under severe discipline, moreover, in order to break any impulses of independence or artistic instincts,"[5] he is assigned to dictate figures to Quinsonnas. It was this clerk, with the alarming name, and "subject to the frenzy of double entry,"[6] who unerringly entered each and all of the bank's transactions in the Great Ledger (*Grand Livre*).

The Ledger, "deserved its capital letter, for it was some six meters high; an intricate mechanism allowed it to be aimed like a telescope at every point on the horizon."[7] In Michel's fevered imagination, The Ledger assumed even greater dimensions, indeed nemesistic ubiquity. Back in his room, unable to find sleep, "he felt he was being pressed between the white pages like some dried plant in an herbarium, or else caught in the binding, which squeezed him in its brazen clamps." The revelatory power of the image resides in the seeming dissimilarity between the ledger and the herbarium, the settling of financial and botanical accounts. Where ledger entries followed Luca Pacioli's exacting syntax of debits and credits, botanical books were kept in the efficient if not elegant specialized Latin of Carl Linnaeus. Linnaeus was not the prize-winning Latinist Michel showed himself to be, albeit to popular disapprobation. "He learned it with difficulty at school," William T. Stearn writes of the Swedish naturalist, "for he seems to have had no talent for languages as distinct from collections of words, but it was an invaluable acquisition."[8] Yet the precise value of this acquisition, which, in the form of Latin binomial names, Linnaeus gifted to the world at large—even if it was not in all quarters unequivocally received—can be assessed in the nature and quantity of work performed to achieve stability and permanence in botanical nomenclature.

The foundations of botany rested upon agreement, governed by codes and conventions of practice, between these often

unruly “collections of words” and a panoply of things. Beyond the “edifice of doctrine,” but also within the Dedalian labyrinth Linnaeus imagined botany to be, lay the ever-threatening chaos of synonymy and unchecked cross-reference.[9] The breakdown of internal controls is evident in the pained explanation James Edward Smith, founder of the Linnean Society of London, felt compelled to give for why the Society was in fact known as *Linnean* and not rather *Linnaean*, in the course of a debate over the proper rendering of Linnaeus’s patronymic and assumed names, and national variations thereof.[10] In opening the books—ledger books, code books, catalogues, editions of the *Species Plantarum* and *Genera Plantarum*—the purpose here is to consider the work of reference, the stores of knowledge, and factories of facts that became (tentatively) fixed points of reference. When not focused more specifically on the architecture of the library, the discussion is guided by a preeminently spatial consideration: the uneasy ratio between container and contained, part and whole, genera and species. It is a question of unstably bound entitles subject to the normalizing imperative of double-entry.

§ 1

“It is a rather new genre of book,” Alphonse de Candolle remarked in his essay-length notice of *Musée Botanique de M. Benjamin Delessert: Notices sur les Collections de Plantes et la Bibliothèque qui le Composent* (1845).[11] Its author Antoine Lasègue was curator of the banker and philanthropist Benjamin Delessert’s (1773–1847) conjoined library and herbarium, one of the largest botanical collections in Europe. De Candolle knew the setting well. Among the works patronized by Delessert and based on his collections was the five-volume *Icones selectae plantarum quas in systemate* (1820–1846), its descriptions written by Alphonse’s father, the Genevan botanist Augustin-Pyramus de Candolle.[12] In his memoirs, Augustin-Pyramus de Candolle warmly recalled Delessert’s liberal hospitality and the evenings they had spent together discussing botany, often and preferably in the company of family.[13] The spiritual seed of the collection was a precious token of amity, the botanical letters and herbarium sent by Jean-Jacques Rousseau to Delessert’s mother, Madeleine-Catherine Delessert, née Boy de la Tour, whom the solitary and stateless philosopher addressed as *chère cousine*. The letters were intended for the education of her daughter Marguerite-Madeleine, introducing her to the Linnaean sexual system and the families of plants. Alphonse de

Candolle observed that for Benjamin Delessert, botany was not only a scientific pursuit, but also a means of cultivating lasting friendships - even beyond the grave.[14] Lasègue indicates that among the most cherished collections in the herbarium, and one "religiously kept separate," were the plants Augustin-Pyramus de Candolle "was the first to describe." In his testament Augustin-Pyramus de Candolle provided instructions for his son to forward these botanical mementos to Delessert as material testimony of his fond sentiments.[15]

These relationships—botanical, familial, and institutional—are the guarded substance of the *Musée Botanique*. With this new genre of book, Lasègue sought to implement in the conduct of botanical research what Linnaeus, in his *Species Plantarum* (1753), sought to formalize with the binomial method: organization, standardization, and economy of time and space in the arrangement of plants.[16] Linnaeus's own herbarium was long to remain the first and final point of reference and appeal in thorny matters of botanical nomenclature. The botanical explorer Carl Friedrich Philipp von Martius provides an image of Linnaeus firmly planted in the academic fastness of Uppsala: "[seated] at the writing table of a small room, from which the dictator of natural history sends throughout the world his works written in that terse, genial Latin in which his whole self is mirrored."[17] All the world, it would seem, looked to Linnaeus, knight of the *Nordstjärneorden* (Order of the Polar Star), for guidance in sorting out the confusing play of likeness and unlikeness that animates the theater of nature. Yet, whether Linnaeus was a dictator or alternatively a wise and impartial legislator was a matter of much partisan debate. In Paris, Georges-Louis Leclerc, comte de Buffon, sternly warned of the tendency of systematic arrangements, in particular Linnaeus's sexual system, to "impose on the reality of the Creator's works the abstractions of the mind."[18] As for the *Musée Botanique*, it was the product of a benevolent regime of surveillance and control. Lasègue sought to manage the historically contingent collectivity of botanical knowledge. The *Musée Botanique* was above all a controlling work of reference.

What could be designated within the realm (or republic) of botany was the purview of the numerous nomenclatural codes and reforms promulgated throughout the second half of the nineteenth and early twentieth century. In facilitating communication and exchange by specifying the nature and location of dispersed botanical collections, the *Musée Botanique* demonstrated the necessity of discursive self-regulation. Lasègue was especially attentive to the special

role that libraries and herbaria played in providing stability within the order(ing) of things. All attempts at legislation and enforcement, particularly the *Lois de la nomenclature botanique* drafted by Alphonse de Candolle and adopted at the 1867 Congrès International de Botanique in Paris, found their ethical and practical grounding in the principle of priority.[19] As articulated by Augustin-Pyramus de Candolle in his *Théorie Élémentaire de la Botanique* (1813), the first author to "record a being in the catalogue of nature had the right to name it."[20] Otherwise, Augustin-Pyramus de Candolle warned, "the whole framework of botanical nomenclature crumbles at its base and inevitably collapses upon itself."[21] The right of priority was permanent and inalienable except when it was not. The cases and causes of these exceptions, which could equally be read as a "stricter construction" of the rule, as variously interpreted, were debated by: the Botanical Club of the American Association for the Advancement of Science at its meeting in Rochester (1892); at the International Botanical Congress in Vienna (1905); in Benjamin Jackson Daydon's prospectus for the Kew *Index of Plant-Names*; and, perhaps most notoriously, in the apparatus of Otto Kuntze's *Revisio generum plantarum* (3 vols. 1891–1898).[22]

Problems of agreement, grammatical or otherwise, did not end with the proper form of plant names, or *phytonomatotechnie*. The term was coined by the surgeon Jean-Pierre Bergeret to describe his system for a universal nomenclature by which any competent observer, without reference to botanical texts, could name a plant by assigning a letter drawn from a tabular key of visible characters. The system resulted in eminently rational solecisms, the genus *Veronica* (Plantaginaceae), for example, rendered by Bergeret as HOQCYABIAHUEZ.[23] Rather, problems ensued when a plant name, once properly established, was not universally recognized or respected. The encroaching chaos of synonymys—Linnaeus reserved the genus *Chaos* for the enduringly unruly class Vermes—was first addressed by the committee appointed by the *British Association for the Advancement of Science* in 1842 to consider rules by which zoological nomenclature could be established on a uniform and permanent basis. The committee, which included, among others, Charles Darwin, Hugh Edward Strickland, John Obadiah Westwood, noted that their findings could be applied with equal correctness to the sister science of botany.[24]

> [W]hen naturalists are agreed as to the characters and limits of an individual group or species, they still

> disagree in the appellations by which they distinguish it. A genus is often designated by three or four, and a species by twice that number of precisely equivalent synonyms; and in the absence of any rule on the subject, the naturalist is wholly at a loss what nomenclature to adopt. The consequence is, that the so-called commonwealth of science is becoming daily divided into independent states, kept asunder by diversities of language as well as by geographical limits.[25]

Presumably the fear was of a return to the "feudal period of botany," as the eminent American jurist and amateur botanist Roscoe Pound would later refer to it in his review of Kuntze's *Revisio generum plantarum*. According to Kuntze, the "brutal lawlessness of nomenclature" after the death of Linnaeus saw the "flowering of botanical robber-knighthood, the followers of which, for a part, were able investigators, but respected no author's right."[26] What was required was rule of law, and inscription technologies for preserving the rights of priority, when warranted by the facts. Due process would thus take the form of criticism, revision, and refinement.

A respect for authority was cultivated in the work of the great promulgator of the rule of priority, Augustin-Pyramus de Candolle. According to the taxonomist and pioneering orchidologist John Lindley, who began his career assisting Robert Brown curating Sir Joseph Banks's herbarium and library, a series of typographic innovations introduced in de Candolle's *Regni vegetabilis systema naturale* (8 vols. 1818–1821) provided the reader with essential indexes regarding the author's own perspicacity and critical acumen. Lindley considered synonyms—lists of all the names applied to a particular species, preferably ordered chronologically—to be a "brief but very instructive history of a plant."[27] In order to show distinctly the different value of these synonyms, de Candolle marked with an asterisk (*) those works in which good original descriptions were to be found; and to indicate those which had been ascertained by the inspection of authentic specimens, he marked with an exclamation point (!) immediately following the name of the author. Thus *Lin.! sp. pl.* 427. would mean that the original specimen from which the plant was described by Linnaeus in the *Species Plantarum*, page 427 had been examined by de Candolle himself; whereas, if the exclamation point had been omitted, then the only evidence, with respect to the plant described by Linnaeus was obtained from his book. "This distinction is of great importance," Lindley writes, "as it shows upon which

synonyms implicit reliance can be placed, and to which we can turn with less confidence."[28]

Where does the botanist turn with complete confidence? Following his discussion of synonyms Lindley addressed the role and function of herbaria, since "to a botanist who studies the science with much attention, and with a view of becoming perfectly acquainted with it, neither books nor the most elaborate descriptions prove sufficient. He finds it indispensible to have continually within his reach some portion of as many species as he can procure."[29] How was *continuity* assured? Even if the botanist had access to an extensive garden, it was only at particular periods that he could study the flowers and fruits of any of them. And even then, a garden rarely contains more than a fifteenth or tenth of the number of known species; far more frequently not a twentieth. Thus botanists contrived a method of preserving, by drying and pressure, specimens of plants which represent all that is most essential to recognize, the *Hortus siccus*, or herbarium.[30] Under ideal circumstances plants assumed their place in an herbarium simultaneously with their entry into the language of botany. Augustin-Pyramus de Candolle instructed collectors that it was necessary without exception to affix a durable label bearing a plant name to the paper upon which it was to be pressed the very moment it was collected.[31] The term "herbarium," it should be noted, designates one or more of these sheets; the portfolio in which these sheets were kept or the book in which they were bound; the cabinet in which the former were collected; or the room or building in which the botanist worked on his collections.[32] Lindley's "within reach" can be interpreted more or less literally with reference to these discrete but mutually encompassing instruments of reference.

Lasègue belonged to that bibliographic class identified by the librarian and scholar Gabriel Naudé as *scriptores bibliothecarii* (writers about books or writers of libraries).[33] If only by virtue of its title, the *Musée Botanique* descends from compendia such as Michael Bernhard Valenti's *Museum museorum* (1704) and Caspar Friedrich Neickel's *Museographia, oder Anleitung zum rechten Begriff und nützlicher Anlegung der Museorum* (1727). Catalogs of catalogs, these works established speculative connections between words and things mediated by the irreducibly specific contents of the collections they described.[34] In his *Guide to the Literature of Botany* (1881), Benjamin Daydon Jackson, editor of the *Index Kewensis* noted that the *Musée Botanique* "contains an account of the different collectors by whose exertions Delessert's Herbarium was brought together."[35] But Alphonse de Candolle recognized that

Lasègue's was also an outward-looking enterprise, a work of cross reference. An innovator in botanical geography and not unrelatedly a precocious statistical demographer of scientific society, de Candolle understood that "a science in which collections are so important requires a book specially devoted to them."[36] Frans A. Stafleu put a name to Lasègue's "rather new genre of the book" in his *Taxonomic Literature: A Selective Guide to Botanical Publications and Collections, with Dates, Commentaries, and Types* (1967): *Index herbariorum*.[37]

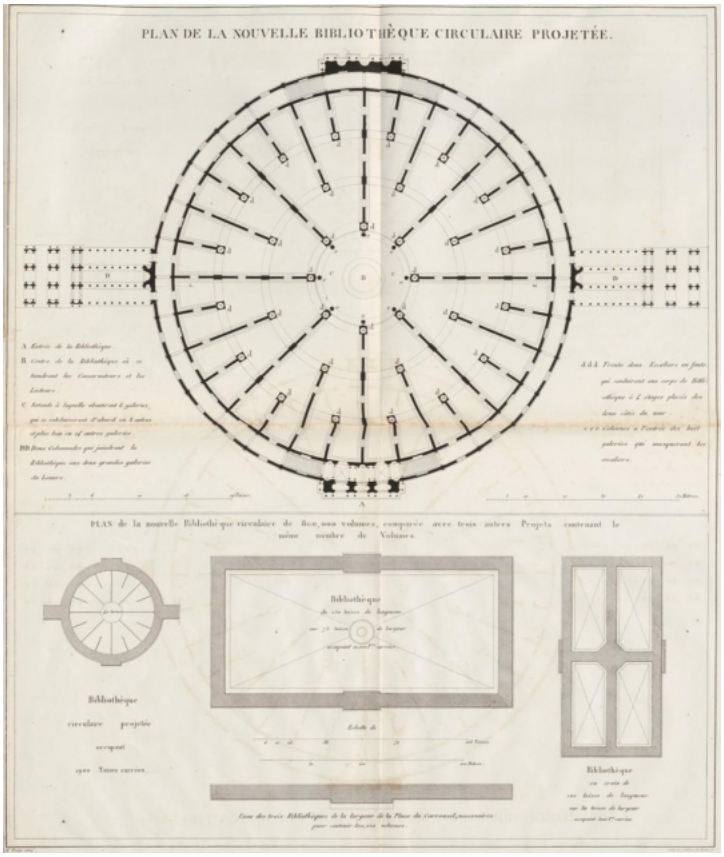
Stafleu's descriptive bibliographic insight is amply validated by the chapter of the *Musée Botanique*'s entitled "Typical Herbaria," in which Lasègue addresses the endemic insufficiency of images and texts to provide conclusive "signs" of the identity of plants. The stability of the evidence contained within the herbarium, consisting of plants named and labeled by the author who first diagnosed them, made it an irrefutable point of reference, verification, and control. It is for this reason that botanists working on a particular class of plants sought out type specimens to "remove their doubts."[38] But how often, Lasègue lamented, are they forced to forego this precaution by the difficulty of visiting remote cities and towns, or by the dispersion of the contents of an author's particular herbarium. Lasègue's ambition was to "facilitate" research and comparison by providing information not only on the "origin of the principal parts of [Delessert's] rich museum," which assumed into itself numerous other collections, but also by providing descriptive notices on other collections throughout Europe.[39]

§ 2

In spite of (or because of) the studied cosmopolitanism of its inclusiveness, as Lasègue himself understood it the *Musée Botanique* was an exemplar of what the librarian Gabriel Peignot had termed a "specialized bibliography." Not only did such a work concern itself with a single branch of knowledge, but, in the case of the *Musée Botanique,* it also contended with the particular genres and species of books produced and used by botanists, including the labeled folio sheets of the herbaria.[40] One of the singular advantages of Delessert's collections, Lasègue wrote, was that numerous items from the library and the herbarium could be consulted at the same time, a form of liberality that could not be afforded in public libraries where visitors were admitted "without exception."[41] An unresolved tension between the ideal of liberal access and the sovereign necessity of control

arguably explains why Lasègue chose to introduce Delessert's botanical library with a discussion of his patron's design for a general library, its rotunda form justified in part by the efficiencies realized in Victor Baltard's Halle au Blé (grain exchange). Delessert's proposal was ostensibly conceived in response to the discourse read by François Arago in the Chambre des Députés, June 2, 1833, on whether it was "suitable and useful" to move the Bibliothèque Royale on the rue de Richelieu into a transversal gallery which would be erected in the Cour du Carrousel.[42] Delessert saw his "panoptic" library as possessing a distinct form of efficacy. The simple arrangement of eight radiating galleries, corresponding to the divisions of the library (theology, law, administration, commerce and finance, natural history, sciences and arts, literature, history, and travel) converging on the central desk of the conservator combined the advantages of a specialized library with those of a general library. The plan envisioned a vast "foyer" where "knowledges (*lumières*) of all things intellectual and physical converge."[43] Whether this *foyer* represented a (pan)optical focal point or a real and emblematic space of welcoming interiority must ultimately be considered with regard to Lasègue's notion that Delessert's Musée was itself a "center of convergence" for the communication and the correspondences of botanists.[44]

Delessert's *Mémoire sur la Bibliothèque Royale, où l'on indique les mesures à prendre pour la transférer dans un bâtiment circulaire, d'une forme nouvelle qui serait construit au centre de la Place du Carrousel* (1835) pursued a model of calculability and accountability consistent with the principles of *bibliothéconomie*, defined by Léopold Auguste Constantin as the science of ordering and managing libraries.[45]



Jean-Marie Victor Viel, "Plan of the Proposed New Circular Library," 1835. From Benjamin Delessert, "Plan of the Proposed New Circular Library," *Mémoire sur la Bibliothèque Royale* (Paris: Henri Dupuy, 1835).

The design by the architect Jean-Marie Victor Viel fitted a grandiose Bramantesque portico to the broad expanses of the building's circular perimeter, rudimentarily articulated in the manner of a Roman palazzo. Yet Delessert says very little about style and decoration. His nearly singular interest was in the economies and forms of control made possible by the library's panoptic form. The radial galleries, furnished with shelves on both sides, not only accommodated twice as many books as ordinary perimeter shelf systems, but also placed the books closer to the center of the rotunda. Surveillance was thus more complete since the conservator, stationed at the center of the rotunda, could take in the entire space and all persons circulating within it at the "glance of an eye."[46] Delessert was familiar with the English philosopher Jeremy Bentham's model "inspection house" from his extensive work in prison reform. With the Restoration, Louis XVIII decreed the creation of an experimental prison based on cellular Philadelphia system, to be directed by François Alexandre Frédéric de la Rochefoucauld-Liancourt with Delessert as his adjunct.[47] In his discussion of Delessert's proposal, Léon Laborde observed that if the singular goal of libraries was the storage of books and exact surveillance,

then the architectonography of the prison provided the perfect source of inspiration.[48] Such an approach, however, broke entirely with the salutary rule that associates the cult of beauty with the realization of utility.

If Delessert's design for the library made no concessions to the cult of beauty, his construal of utility was not an unreflected one. The son of a founding regent of the *Banque de France*, Delessert was sent with his older brother Étienne to study at the University of Edinburgh where he became acquainted with the economist Adam Smith and philosopher Dugald Stewart. The rationality and moral sentiment characteristic of the Scottish Enlightenment were as mixed in his thinking as the "economic soup" distributed to the poor of Paris under Delessert's charitable munificence. Concocted by Augustin-Pyramus de Candolle, the recipe for the soup united "economy, amenity, and salubrity."[49]

Delessert's proposal was first and foremost an exercise in the disposition of things, of taking precise measure of a collection of as yet indeterminate size and determining the proper scale of the building meant to house it. Bibliospace was to be governed by establishing a ratio between the institutional frame and its potentially unruly material and cognitive contents. This form of governance could well extend its domain into the conduct of readers, but it originated with the methods of a typically overlooked patron of order: the bibliographer. Arrived at through finite calculation of bounded particulars (folios, quartos, octavos, duodecimos, sextodecimos, manuscripts, charters, diplomas, etc.), Delessert's calculation of the new library's capacity was an exercise in statistical *bibliothéconomie*. With the circular arrangement one could place 800,000 volumes in a space of 1,900 square toises (1 toise = 6.39 feet), while if one were to build according to the old system, which is to say four galleries around a long square, it would require no less than 11,250 square toises.

Delessert's methodology derives from Adrien Balbi's *Essai Statistique sur les Bibliothèques de Vienne* (1835), one in a series of extensive researches the Venetian geographer and statistician undertook that yielded a comparative table of the actual and stated contents of one hundred fifty six libraries throughout Europe. Balbi confronted the difficulty of determining the value or importance by the mere enumeration of volumes, noting the disproportionate worth of some small collections of incunabula or manuscripts such as were to be found in the "precious" botanical library of de Augustin-Pyramus de Candolle in Geneva. But this measure must still serve as a basis of comparison; it is the only one

that can be "reduced to numbers."[50] For his part, Delessert notes the library of the duc de La Vallière contained 5,660 items, but a single volume, *La Guirlande de Julie*, sold for 14,000fr., in a sale that brought 464,000fr. But what Delessert's discussion of Balbi's analysis of the *Archivio Generale* of Venice makes evident is that it was not the value or significance of any single item that was the question—as well it might in a specialized bibliography such as Lasègue's—but rather the bibliometric methods for delimiting the totality of the collection.

The *Archivio Generale* occupied two hundred ninety eight rooms, salons, and corridors the walls of which were lined from top to bottom with shelves. If all the shelves were placed in a row, Balbi calculated, they would form a line 77,238 feet long, more than fourteen and a half miles, or nearly one and half times the distance between Paris to Versailles. Even still, the shelves were insufficient to house the 8,664,709 volumes and binders containing the holdings of 1,890 separate archival entities. Supposing that each volume or binder contained eighty sheets, and conservatively estimating that each sheet was 16 x 9 inches (many ancient documents were much larger), Balbi estimated that if combined the 693,176,720 sheets would form a band 1,444,800,000 feet long, which, according to the measurement of its circumference indicated by the Austrian astronomer Joseph Johann Littrow, would circle the earth 11 1/30 times.[51]

What particularly interested Delessert in Balbi's analysis was not the actual measure of the Bibliothèque royale but rather its rate of growth. The initial basis for Balbi's estimation were the totals presented in the conservator Joseph Van Praet's *Catalogue des livres imprimés sur vélin de la Bibliothéque du Roi* (1822).[52] But of course these totals were not static sums. Van Praet also provided statistics on annual acquisitions, based on Adrien-Jean-Quentin Beuchot's *Bibliographie de la France, ou Journal de l'imprimerie et de la Librairie*, and the manuscript catalogue kept by his assistant Edmond Demanne. Pierre-Antoine-Noël-Bruno Daru had similarly analyzed to Beuchot's serialized bibliographies to construct his tables of "intellectual statistics," which, in the "glance of the eye," revealed trends in the changing reading habits of the French public. For Daru the format of books did not matter; a work published on theology equaled a work published on science. It was the changing proportional distribution of subject matter that was of potentially interpretable significance.[53]

Balbi was agnostic with regard to content. The underlying concern was that there be place for all the library's holdings for all its holdings to be in their proper place. Based on Praet's figures, Balbi applied a coefficient multiplier, reflecting the ever increasing activity of the press, to calculate the Bibliothèque royale's actual and likely future holdings. While faithful to the principles of accountancy and bookkeeping that governed his banking enterprises, Delessert seemingly took inspiration from Balbi's speculative space-time measures of the *Archivio Generale*. Nothing could be easier than verifying the holdings of the Bibliothèque royale in a precise manner, he wrote. If an employee could count 1,000 books in ten minutes, then 30,000 or 40,000 books could surely be counted in the course of a day. Given a few days, a small team of employees could arrive at a comprehensive total, even distinguishing folios, quatros, octovos. Evidently unable to conduct such an audit, Delessert ultimately adopted the proportions established by Van Praet of two hundred fifty volumes per square toise, with a collection that over the course of ten years would increase to 800,000 volumes.[54]

§ 3

Lasègue prepared the groundwork for his *Index herbariorum* by engaging in a quantitative exercise comparable to Balbi's bibliometric methods. Under the heading "Statistique des Végétaux," Lasègue contends first and foremost with the dramatic increase in the number of plants described since the publication of Linnaeus's *Species Plantarum* (1753). In all his writings, Linnaeus had described no more than 8,551 species: 7,728 phanerogams and 823 cryptogams.[55] While Joseph Pitton de Tournefort's *Eléments de botanique, ou Méthode pour reconnaître les Plantes* (1694) contained 10,146 species, and John Ray's *Historia Generalis Plantarum* (1704) contained 18,655, Lasègue notes that at the time they wrote, the slightest variation in the form of a plant led to the erection of a new species. Linnaean principles modified this tendency, the application of his system resulting in more sharply drawn distinctions between species and a consequent diminution in their number. The number of species in more recent works revealed "how greatly botany has been enriched by new discoveries."[56] Where those discoveries were made is a matter to be considered presently. The mycologist Christiaan Hendrik Persoon's *Synopsis Plantarum* (1805–1807) contained 20,000 species, excluding cryptogams. In his *Nomenclator Botanicus: Enumerans ordine alphabetico nomina atque*

synonyma, tum generica um specifica, et a Linnaeo et recentioribus de re botanica scriptoribus plantis phanerogamis imposita (2 vols. 1821–1824), Ernst Gottlieb Steudel enumerated 39,684 phanerogams and 10,965 cryptogams, or a total of 50,649 species.

The efforts made by the Esslingen medical doctor and botanist Steudel to institutionalize the study of botany, including the great service done by the *Nomenclator Botanicus* in untangling synonyms, warranted special mention by Lasègue. Steudel was a founder along with Christian Ferdinand Friedrich Hochstetter of the *Unio Itineraria* to underwrite botanical exploration, including Friedrich Welwitsch's travels in the Azores and Cape Verde Islands and Wilhelm Schimper's in Africa, and the distribution of exsiccatae to its fee-paying subscribers. But more than voluntary subscription, which paid dividends in the form of rare and reliably named plant specimens, was required to enact Steudel's more far-reaching proposal for cooperation and collective oversight: an international union of botanists and a nomenclatural tribunal.[57] Steudel had been impressed by the Bohemian paleobotanist Kaspar Maria von Sternberg's assessment of the current state of the field published in the inaugural issue of the *Denkschriften der Königlich-Baierischen Botanischen Gesellschaft in Regensburg* (1815). Surveying the state of confusion and potential chaos in the literature, Sternberg called for a "congress" where plant names could be adjudicated by mutual consent rather than a single "judge." The congress would also serve as a sitting editorial committee for the publication of an urgently needed *Bibliotheca critica Synonymorum*.[58] Consistent with his later role in establishing the Vaterländisches Museum in Böhmen, a monument to Bohemian nationalism, Sternberg was primarily interested in rationalizing the production of cantonal and regional floras. What Steudel imagined was not merely international and comprehensive in scope, but also threatened to displace the seat of botany's notional as opposed to national government.

While plants from all corners of the globe had once been sent to the "one and only Linnaeus," should botanists now be any less willing to communicate their discoveries to the botanical union in order to certify the value of their determinations, Steudel asked. Under specific conditions, existing herbaria would be handed over to the union for the common benefit of science. Should their owners refuse, then their collections would be regarded as "dead, non-existing treasures." No further reference would be made to them by union members. Attached to the establishment of this "standard herbarium"

was the provision that no botanical works be accredited, and no plants regarded as properly named, unless the union approved of it. The union would in addition publish a general journal making known their rulings.[59] Whenever possible, duplicate collections of the standard herbarium would be provided to the botanical society to provide the material for a collaboratively produced *Systema Vegetabilium*, each society's contributions subject to union's tribunal. Lasègue does not find Steudel's proposal in in way "unreasonable." Yet the impossibility of constituting such a tribunal, of "subjecting all botanists to the examination, the revision, the criticism or condemnation of their works, renders his idea altogether impracticable."[60] Impracticable did not mean undesirable.

The results of Lasègue's botanical statistics only confirmed the need for implementing more effective means of communication, comparison, and control. In the 1841 second edition of Steudel's *Nomenclator Botanicus* the number of phanerogams nearly doubled to 78,000 species. By that measure the number of phanerogams had increased twenty-four times since the publication of the Linnaeus's *Species Plantarum*. Where did they all come from? The increase was in part due to botanical exploration, promoted by the *Unio Itineraria* and on a far larger scale by academies of science, botanical gardens, East Indies companies, and individual travelers; some at great personal expense, most all of them at their personal peril. Lasègue provides a historical conspectus of this far-reaching botanical enterprise in a chapter entitled "Expeditions and Travels, the botanical collections of which are preserved in M. Delessert's herbarium." This chapter of the *Musée Botanique* was meant to be referred to in concert with the "Notices sur les Différents Herbiers formant le fond de la collection de M. Delessert." *Fond*, "depth" or "background," is a complicated word. *Fonds*, in addition to being the plural form of *fond*, is a singular noun whose primary meaning is "fund" or "capital." A library collection is also called a *fonds*, and the terms can be used more generally to mean "source" or "resource."[61] But while the herbarium condensed the world into itself, it also contained unvisited recesses and uncatalogued treasures. Lasègue notes that part of the great increase in the number of genera and species was the result "deeper study of a large number of specimens contained in herbariums of which no account had been made."[62]

§ 4

What was yielded by the exploration of *fonds* is well exemplified in Lasègue's geographically arranged chapter "Expéditions et Voyages dont les Collections Botaniques sont Conservées dans l'Herbier de M. Delessert," under the heading: "Docteur Asa Gray. Carolinie du Nord." The plants were collected while Gray, John Gray, and James Constable herborized in the Alleghenies in June-July 1840, Lasègue deriving his information from the published letter Gray sent to William Jackson Hooker narrating the expedition. But it was the plant that they did not find, *Shortia galacifolia* (Oconee bells), that proved most famous. To understand why Gray went in search of it requires some context that illuminates the depths of *fonds*. Gray's fruitless search represents a curious local exception to Lasègue's notion that the number of known plants had been increased by botanical exploration *and* a greater familiarity with the holdings of imperfectly catalogued herbaria. He had seen the specimen in an herbarium, but it was not then traceable to the place (in nature) it was reported to have been found. As with the delicate and unbalanced play of likeness in the metaphor of the herbarium and ledger book, it places stress on seeming asymmetries of reference.

Alphonse de Candolle regarded Asa Gray's "Notices of European Herbaria, particularly those most interesting to the North American Botanist" (1841), as the only work alongside Lasègue's to provide a comprehensive guide to botanical collections. Sereno Watson, Gray's assistant and eventual successor as curator of the eponymous herbarium established by Gray at Harvard University, observed that the "prime requisites to the work of any systematic botanist are an herbarium and a library." Of these, he lamented, there were few worthy of the name in America. Type specimens were almost wholly wanting. The best to be found belonged to the Academy of Natural Sciences at Philadelphia and that assembled by Dr. John Torrey at New York, where Gray commenced his botanical studies and the work that was to become his and Torrey's *A Flora of North America: containing abridged descriptions of all the known indigenous and naturalized plants growing north of Mexico* (1838–1843). The collections of John Clayton, Pehr Kalm, and Mark Catesby, of Thomas Walter, John Bartram, and André Michaux, of John Bradbury, Friedrich Traugott Pursch, and even of Meriwether Lewis and William Clark, of Archibald Menzies and David Douglas had been "scattered through different European herbaria."[63] It was to gather information about these *disjecta membra* that Gray departed for Europe November 9, 1838 aboard the packet ship *Philadelphia*.

His first port of call, so to speak, was the "truly hospital mansion" of William Jackson Hooker at Woodside Crescent, Glasgow.[64] Hooker, to whom *A Flora of North America* is warmly dedicated, provided Gray with "authentic specimens" of plants described in the author's own *Flora boreali-americana, or, the Botany of the Northern Parts of British America* (1840) and *The Botany of Captain Beechey's Voyage* (1841),[65] along with others selected from the collections made in Oregon and the Rocky Mountains by Thomas Drummond, David Douglas, and others. The extensive acknowledgements of *A Flora of North America* include, *inter alia*, mention of Robert Brown who gave Gray entry to the Banksian herbarium, and the herbaria of John Clayton, Catesby, Leonard Plukenet, and other collections in his charge at the British Museum; George Bentham for access to his rich herbarium and especially the plants collected by Douglas in Oregon and California; De Candolle for the "important privilege of freely consulting his large herbarium through all the families which are now published in his *Prodromus*"; and, Delessert for access to his "immense herbarium and very complete botanical library."[66] Consulting the herbariums of Europe was a means of repatriating the plants that appeared in Gray and Torrey's *A Flora of North America*.

In his European journal, Gray wrote of his visit to André Michaux's enormous herbarium of North American plants and the incomplete specimen he found in its further recesses among the *Plantae incognitae*. "I claim the right of a discover to affix the name," dedicating it to his correspondent Charles Wilkins Short, the noted Kentucky medical doctor and botanist.[67] But despite the topographic indications given in Michaux's own travel journals, which Gray faultily consulted, he was subsequently unable to locate the living flower. Upon returning from his tour of European herbaria in November 1839 Gray recommenced collecting specimens for *A Flora of North America*. His frustrated ambition is recorded in the letter to Hooker: "We were likewise unsuccessful in our search for a remarkable undescribed plant, with the habit of *Pyrola* and the foliage of *Galax*, which was obtained by Michaux in the high mountains of Carolina." To have done so would have meant replacing the de Candollean sign of doubt (?) with the sign of certainty (!). Instead, the reference to *Shortia galacifolia* read: (*vid. spec. sicc. in herb. Mx.*, cum schedula 'Hautes Montagnes de Carolinie. An Pyrolæ spec.? an genus novum?').[68] Gray's right to priority remained that of a second-hand god.

Gray's "Notices of European Herbaria" can be read as an elaboration upon the acknowledgment section in *A Flora of*

North America. William Jackson Hooker notes that Gray had visited these collections "in order to ensure greater correctness in the synonymy."[69] Many of the plants described by Gray and Torrey were native to the New World with its burgeoning institutions of science, but naming them with any degree of certainty required him to consult the long-accumulated stores of the Old World's botanical fiefdoms. Alongside Lasègue's still more comprehensive *Musée Botanique* it provided the means for performing this form of nomenclatural due diligence. From the great increase in the number of known plants, however, it often happened that the brief description, and even the figures of older authors, proved insufficient for the determination of a particular species a botanist had in view. Hence it became necessary "to refer to the herbaria where the original specimens are preserved." In this respect, the collections of early authors possessed an importance "far exceeding their intrinsic value," since they were seldom large, and the specimens in them were often imperfect.[70] With the introduction of the Linnaean nomenclature, Gray wrote, "a rule absolutely essential to the perpetuation of its advantages was also established, namely, that the same name under which a genus or species is first published shall be retained." An accurate determination of the Linnaean species was of the first importance; and this, in many instances, "is only to be attained with certainty by the inspection of Linnaeus and those authors upon whose descriptive phrases or figures he established many of his species." Gray's notice therefore "naturally commence[d] with the herbarium of the immortal Linnaeus."[71] But immortality was only attained through what was communicated and passed down—permanence gained by convention, legislation, and judgment (collective and individual).

After his death, Linnaeus's herbarium, library, and collections passed into other hands. Gray relates the circumstances of its sale for £1,000 in 1784 to the young medical student and promising botanist James Edward Smith, who four years later founded and was the first president of the Linnean Society of London. The collection had first been offered to Sir Joseph Banks, who, not being disposed to make the purchase, recommended it to Smith, the son of a prosperous Norwich silk and cloth merchant. "It will require no small nor inelegant house to place so capital a collection and library in a commodious manner, such as will answer your design in the possession," James Edward Smith's father wrote in reply to his son's urgent request to underwrite the purchase.[72] While Banks's resources were

diminished by this date, his longstanding preeminence as a patron of botany was a model for Delessert. The title-page epigraph of the *Musée Botanique* reproduces the homage paid by Cuvier to Sir Joseph Banks: "The welcome of the master, a rich library, collections which would be sought in vain even in public establishments, attract to his home friends of science." Suggesting a form of botanical *translatio studii*, William Jackson Hooker suggested that Delessert came to assume a position in Paris comparable to that formerly held by Banks in London.[73] Yet what the handling of the exported Linnaean collections made clear was that their homes, along with the apartments Smith hired in Paradise-row, Chelsea to ensure both the safety and accessibility of his purchase, served as clearing houses of botanical information, with all the attendant concerns for bookkeeping practices.

Gray regarded the translation of the Linnaean collections to England as a fortunate circumstance, their being thus removed from such a "remote situation" (Uppsala) to the "commercial metropolis of the world, where they are certainly more generally available."[74] Commerce must be understood here to include the *commercium litteralia* (literary exchange) of early modern Europe by which collaboration between like-minded and socially equal scholars was facilitated and validation and esteem mutually conferred and confirmed.[75] The at-once practical and ideal ambition of unfettered communication is preserved in the title of the Nuremberg physician Christoph Jakob Trew's journal *Commercium Litterarium ad rei Medicae et Scientiae naturalis incrementum institutum*, of which Linnaeus was an avid follower. As the historian of scientific periodicals David A. Kronick notes, the terms "Letters," "Correspondence," and their cognates in other languages appeared with increasing frequency in the titles of specialized publications. The section headed "epistolae" in the catalogue of the library of Joseph Banks covers five pages.[76] Gray's letter recounting his travels to the Carolinas would of course figure on this list. But such communications would as languish in a dead letter office if not for works such as Lasègue's in which the multiple vectors of reference and repositories of information were positively indicated.

Lasègue's own lengthy discussion to the Linnaean herbarium focused on the circumstances of its purchase. What new information he presents was gathered by Alphonse de Candolle, who had it from Smith himself that, despite his own published accounts, the appealingly dramatic story that upon hearing of the herbarium's sale Gustavus III, king of Sweden, dispatched a vessel to intercept the brig

Appearance was entirely without substance.[77] As evidence of the credence given to the story in question, Lasègue notes that while he wrote his entry on Linnaeus he had "before his eyes" an engraved portrait of Smith accompanied by a vignette of two ships within hailing distance with the caption: The pursuit of the ship containing the Linnaean collection, by order of the King of Sweden.[78] The Swedish lichenologist and Linnaeus biographer Theodor Magnus Fries suggested that it was the power of the images that helped spread the story. But for Lasègue what ultimately mattered was the *Appearance*'s freight. He reprints the French biographer Antoine Laurent Apollinaire Fée's translation of Linnaeus's manuscript enumeration of the sources and content of his herbarium—headed by the claim "without doubt, the greatest ever seen"—as if it were a bill of lading.[79]

The codicological traces of James Edwards Smith's inventory of the Linnaean collections were recovered in 1937 by Spencer Savage, assistant secretary and librarian of the Linnean Society. Savage discovered the tell-tale annotations in a copy of the *Systema vegetabilium*, edit. 14, by Johann Andreas Murray, 1784. The annotations read: "labelled on the back by some careless person edition 13," which Murray came upon in an "inconspicuous position at the end of one of the shelves in Linnaeus's library."[80] Like several other books in the library, it had been added to by Smith, with his inscription on the flyleaf: *Novr*. 1784. *Ex dono Illust: Banksii*. Its provenance was unimpeachable. On p. 50 Savage found a pencil note by Richard Kippist, another former Linnaean Society librarian: ✓ *indicates that there is a spec^{m} in the Linnean Herb^{m} (R.K.)*. Careful examination of the tick marks along with other annotation evidently left by Smith led Savage to the conclusion that the markings dated to the years 1784–1785 and this copy of the *Systema vegetabilium* was the "record of the Linnaean herbarium as it came into his hands from Sweden."[81] The species ticked were those which Banks, Jonas Dryander (a student of Linnaeus at Uppsala, librarian to Banks, and first librarian of the Linnean Society), and Smith collectively agreed were the plants originally described by Linnaeus. Against other entries Smith wrote HB [=Herb. Banksii], which Savage balanced against a Smithian MS., *Desiderata Banksiana*, Jan. 1785 enumerating eighty-three specimens given by Smith to Banks from the Linnaean herbarium. "In other words," writes Benjamin Daydon Jackson, the herbarium of Banks and Smith were enriched at the expense of the Linnean herbarium."[82]

§ 5

Alphonse de Candolle's estimation of Lasègue's *Musée Botanique* becomes still more clear through the retrospective lens of his *La Phytographie; ou L'art de décrire les végétaux considérés sous différents points de vue* (1880). In the section entitled "Répartition actuelle d'un grand nombre d'herbiers qui servent comme preuves ou explications des descriptions publiées" de Candolle did for the *fonds* of botanical research what, in his important work on botanical geography, he had done by defining the stations and habitations of plant species. De Candolle compiled a directory—from A (Acerbi, Giuseppe) to Z (Zwackh-Holzhausen, Philipp Franz Wilhelm von)—with "information" regarding the location, origin(s), and descriptions of collections which had themselves served as the bases of important publications. The singular goal, with numerous possible outcomes, was to facilitate cross-reference. De Candolle explained:

> One of the most positive areas of progress has been the care for collections, especially herbaria, which are at once the means of observation and the proofs. The modern exigencies of exactitude have driven authors to mention whether they have seen a specimen and in which herbarium they have seen it. Synonymy has precise rules that assure the law of priority of names and certify the bibliographic history of groups. Thanks to this ensemble of innovations, botanical books have been edited better and better.[83]

Linnaeus's "Ariadne's thread," indeed one of several such strands, leading from de Candolle to Lasègue can be seen in the entry for the Dutch botanist Jean Burman: "plants from the *Cap*: herb. Delessert (Lasègue, Mus. Deless., p. 66)." The entry leads from the *Musée Botanique*'s inventory of the Delessertian herbarium to its source in the herbarium assembled by Burman to compose his *Prodromus Florae Capensis*, and thence notionally to the Cape Colony (South Africa). Lasègue also separately mentions a small and "rather curious" herbarium in Delessert's collection consisting of the plants collected by Linnaeus during his tour of Lapland and served as the type herbarium, bearing his "handwritten annotations," for the species enumerated in the *Flora Lapponica* (1737). These were given by Linnaeus to his Dutch friend Johannes Burman.

How the Burman collection came into Delessert's possessions is discussed in Alphonse de Candolle's edition of

his father's *Mémoires*. The elder de Candolle recounts his travels in Holland in 1799, which were as formative for him as they had been for Linnaeus half a century earlier when he enjoyed the enlightened and liberal patronage of the banker George Clifford at Hartenkamp, commemorated in the *Hortus Cliffortianus* (1738). Fée suggests that in underwriting de Candolle's *Icones selectae plantarum* Delessert had made himself the new Clifford.[84] De Candolle obtained numerous succulent plants which, on his return to Paris, were cultivated in the Jardin des Plantes and became the subject of his *Plantarum historia succulentarum* (1799–1837). He also purchased books, but more importantly entered into "useful relationship" with their authors. It was through these relationships that he obtained "information" about the impending sale of Burman's herbarium of over 29,000 plants. Seizing the rare occasion, De Candolle convinced Delessert of the advisability of obtaining it, and it was this acquisition that "began the growth of the collection which has become so useful to science and to myself."[85] Cultivating "useful" contacts was central to Alphonse de Candolle's own effort to keep the books. The letters he solicited from the keepers of important collections were themselves collected in a "dossier which is not the least interesting manuscript in my library," constituting a sort of "statistics of herbaria in the current moment."[86] De Candolle compiled an herbarium of botanical information.

Instituting a regime of law and order, enforcing the law of priority, was not merely a matter of legislation, but was also one of exercising (presumably gentle) compulsion and correction. Occupying the threshold, real and conceptual, between conjoined realms of social and scientific discipline, Lasègue sought to govern the coherence of words and things by institutionalizing access to authoritative sources. He saw his work corresponding to the same desire that animated Delessert's passion in assembling his collections: "to enlarge the circle to which they have been confined."[87] The circle was indeed to be expanded, but not disrupted. Delessert was of the opinion that it would be "advantageous to concentrate, in a single book, those scattered details which it is sometimes impossible, and always difficult, to obtain."[88] The *Musée Botanique* was a record of matters of fact, but not matters of judgment or law. By placing all relevant sources "continually within [the author's] reach," to return to Lindley's notion, Lasègue also implicitly subjected botanists to a general tribunal of criticism and cross-examination. As described in the chapter "Concerning Some Nineteenth-Century Authors, and the Difficulty of Obtaining Them," Verne's Michel Jérôme Dufrénoy confronted a peculiar quandary

when he sought to consult the long unsought for literary treasures at the Imperial Library. “The formalities necessary to obtain a work were quite complicated; the borrower’s form had to contain the book’s title, format, publication date, edition number, and the author’s name—in other words, unless one was already informed, one could not become so.”[89]

✓ Transparent Peer Reviewed

Edward Eigen, “Banking, Botany, and *Bibliothéconomie*: On the Science of Keeping the Books,” *Aggregate* 1 (October 2013), https://doi.org/10.53965/UXON2844.

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1 On circumstances of the discovery see Piero Gondolo della Riva’s “Préface” to Jules Verne, *Paris au XXe Siècle* (Paris: Hachette, 1994), 11–24. The edition cited in the text is *Paris in the Twentieth Century*, trans. Richard Howard (New York: Random House, 1996). ↑

2 Ibid, 5. ↑

3 Ibid, 5. ↑

4 Ibid, 42. ↑

5 Ibid, 55. ↑

6 Ibid, 57. ↑

7 Ibid, 62. ↑

8 William T. Stearn, “Linnaeus’s ‘Species Plantarum’ and the Language of Botany,” *Proceedings of the Linnean Society of London* 165 (1955): 158 [158–164]. ↑

9 Julius von Sachs, *History of Botany (1530–1860)*, trans. Herny E. F. Garnsey (Oxford: Clarendon Press, 1890), 37. ↑

10 James Edward Smith, “To the Editor of the Monthly Magazine, *The Monthly Magazine* vol. 29, no. 4 (April 1, 1810): 202 [201–202]. ↑

11 Alphonse De Candolle, “Musée Botanique de M. Benjamin Delessert,” *Bibliothèque Universelle de Genève*, ser. 2, vol. 57 (1845): 151 [150–176]. ↑

12 Augustin-Pyramus de Candolle, *Mémoires et Souvenirs* (Genève: Joel Cherbulier, 1862), 65. For a comprehensive discussion of the *Musée Botanique*, see Frans A. Stafleu, “Benjamin Delessert and Antoine Lasègue,” *Taxon* 19 (1970): 920–936. Stafleu’s article was published in conjunction with a facsimile edition of Lasègue’s *Musée Botanique* in *Historiae Naturalis Classica* 81 (1970). See also Thierry Hoquet, “La Bibliothèque Botanique de Benjamin Delessert,” *Bulletin du Bibliophile* 1 (2002): 100–141. ↑

13 De Candolle, *Mémoires et Souvenirs*, 65. ↑

14 Alphonse De Candolle, “Musée Botanique de M. Benjamin Delessert,” *Bibliothèque Universelle de Genève*, ser. 2, vol. 57 (1845): 154 [150–176]. ↑

15 Antoine Lasègue, *Musée Botanique de M. Benjamin Delessert, Notices sur les collections de plantes et la Bibliothèque* (Paris: Librairie de Fortin, Masson, 1845), 292. ↑

16 T. A. Sprague, “The Plan of the Species Plantarum,” *Proceedings of the Linnean Society of London* 165 (1955): 151 [151–156]. ↑

17 Von Martius, “Notice of the Life and Labours of De Candolle: extracted from the Address delivered before the Royal Botanical Society of Ratisbon, at its meeting of the 28th of November 1841,” *The Annals and Magazine of Natural History* 12 (1843): 13 [1–20]. The passage was translated by Asa Gray. ↑

18 Georges-Louis Leclerc, comte de Buffon, "Premier discours de la manière d'étudier et de traiter l'histoire naturelle," cited in Phillip R. Sloan, "The Buffon-Linnaeus Controversy," *Isis* 67 (1976): 359 [356–375]. On the reception of Linnaeus see Pascal Duris, *Linné et la France, 1780–1850* (Paris: Droz, 1993). ↑

19 Alphonse de Candolle, *Lois de la nomenclature botanique adoptées par le Congrès International de Botanique tenu a Paris en Aout 1867* (Geneva: H. Georg, 1867). "Discussion des Lois de la Nomenclature botanique," in Eugène Fournier, ed., *Actes du Congrès International de Botanique tenu à Paris en Août 1867 sous les auspices de la Société Botanique de France* (Paris: Germer Baillière, 1867), 177–208. Art. 15: "Each natural group of plants can bear in science but one valid designation, namely, the most ancient, whether adopted or given by Linnaeus, or since Linnaeus." ↑

20 Augustin Pyramus de Candolle, *Théorie Élémentaire de la Botanique* (Paris: Déterville, 1813), 228. ↑

21 Ibid, 250. ↑

22 See Benjamin Daydon Jackson, "The New 'Index of Plant-Names," *Journal of Botany, British and Foreign* 25 (1887): 66–67 [66–71]. See also, Asa Gray, "Botanical Nomenclature," *Journal of Botany, British and Foreign* 25 (1887): [353–355]; Edward L. Greene, "Dr. Kuntze and His Reviewers," *Pittonia* vol. 2, pt. 11 (1892): 263–282. ↑

23 Jean-Pierre Bergeret, *Phytonomatotechnie universelle, c'est-à-dire, l'art de donner aux plantes des noms tirés de leurs caractères* (3 vols. 1783–1785). ↑

24 "Report of the Committee appointed to consider of the rules by which the Nomenclature of Zoology may be established on a uniform and permanent basis," *Report of the Twelfth Meeting of the British Association for the Advancement of Science; Held at Manchester in June 1842* (London: John Murray, 1843), 121 [105–121]. H. E. Strickland, John Philips, John Richardson, Richard Owen, LeonardJenkyns, W. J. Broderip, J. S. Henslow, W. E. Shuckard, G. R. Waterhouse, W. Yarrell, Charles Darwin, J. O. Westwood. ↑

25 "Report of the Committee appointed 'to consider of the rules by which the Nomenclature of Zoology may be established on a uniform and permanent basis," *Report of the Twelfth Meeting of the British Association for the Advancement of Science; Held at Manchester in June 1842* (London: John Murray, 1843), 106 [105–121]. ↑

26 Roscoe Pound, "Recent Literature: Kuntze's *Revisio Generum*," *The American Naturalist* 26 (February 1892): 152–153 [147–155]. Kuntze, *Revisio Generum Plantarum* (1891), I, xl. ↑

27 John Lindley, *An Introduction to Botany* (London: Longman, Orme, Brown, Green, and Longmans, 1839 [3rd edit.]), 534 ↑

28 Ibid, 535. ↑

29 Ibid, 537. ↑

30 Ibid, 537. ↑

31 Augustin-Pyramus de Candolle, "Instruction Pratique sur les Collections Botaniques," *Bibliothèque Universelle des Sciences, Belles-Lettres et Arts* 56 (1834): [169–191] ↑

32 As Bruno Latour notes, the herbarium's scale and structure made it a perfect intermediary between hardware (since it shelters) and software (since it classifies)—between a box and the tree of knowledge. Bruno Latour, *Pandora's Hope, Essays on the Reality of Science Studies* (Cambridge: Harvard University Press, 1999), 34–35. ↑

33 Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven: Yale University Press, 2010), 161. ↑

34 Giuseppe Olmi, "Théâtres du Monde, Les Collections Européennes des XVIe et XVIIe Siècles," in Roland Schaer, ed., *Tous les Savoirs du Monde* (Paris: Flammarion, 1996), 276. ↑

35 Benjamin Daydon Jackson, *Guide to the Literature of Botany* (London: Longman, Green, & Co., 1881), 421. ↑

36 Alphonse de Candolle, "Musée Botanique de M. Benjamin Delessert," 151. ↑

37 Frans A. Stafleu, "Benjamin Delessert and Antoine Lasegue," *Taxon* 19 (1970): 920 [920–936] ↑

38 Lasègue, *Musée Botanique*, 40. ↑

39 Ibid, 1. ↑

40 Ibid., 510. See Gabriel Peignot, *Répertoire de Bibliographies Spéciales, Curieuses et Instructives* (Paris: Renouard, 1810). ↑

41 Ibid, 553. ↑

42 François Arago, "Sur la Grande Bibliothèque de Paris," in J. A. Barrall, ed., *Oeuvres Complètes de François Arago* (Paris: Gide et J. Baudry, 1856), VI, 612–621. ↑

43 Benjamin Delessert, *Mémoire sur la Bibliothèque Royale* (Paris: Henri Dupuy, 1835), 11. ↑

44 Lasègue, *Musée Botanique*, 552. ↑

45 L[éopold] A[uguste] Constantin, *Bibliothéconomie, instructions sur l'arrangement, la conservation, et l'administration des bibliothèques* (Paris: J. Techener, 1839), 3–4. ↑

46 Delessert, *Mémoire sur la Bibliothèque Royale*, 4. The economies extended to the method of construction. The chief advantages of the circular buildings, Delessert writes, is that all its parts resemble each other; each of the library's eight internal divisions are identical. The walls, columns, vaulting, stairs, galleries, glass-fronted book cases, etc. are all the same and can be completed in a short space of time. One could study in advance the best form to adopt for each of these components, and then provide models to the different contractors. To expedite the construction process, four or five different contractors should be engaged, each competing to complete a section of the building. This competition presents incontestable advantages in terms of economy and promptness of execution. ↑

47 J. B. Duvergier, *Collection Complète des Lois, Décrets, Ordonnances, Réglemens et Avis du Conseil-d'État*, vol. 19 (Paris: A. Guyot, 1827), 230. Slated to open May 1, 1815, the project was abandoned following the events of March 20. *Ferdinand Dreyfus, Un Philanthrope d'autrefois: la Rochefoucauld-Liancourt, 1747-1827* (Paris: Plon-Nourrit, 1903), 460–461. ↑

48 Léon Laborde, *De l'Organisation des Bibliothèques dans Paris. Hutième Lettre* (Paris: A. Franck, 1845), 33. ↑

49 Benjamin Delessert, *Sur les Fourneaux à la Rumford et les Soupes Économiques* (Paris: An VIII), 13–14. ↑

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