

to be painted on furniture employed exclusively for the gratification of the king. Specimens of both these fig-trees have been planted in the East India Company's garden in the island of St Helena, where, although young, they appear (1807), in a flourishing condition."

The above corroborates what we have already mentioned, viz., that the Banyan is quite a different tree from the *F. religiosa*, to which, however, it has been referred by most botanists in this country, as well as on the continent of Europe.

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*Notices of European Herbaria, particularly those most interesting to the North American Botanist.*

[IN the present volume, p. 293, while giving an account of the excellent North American Flora, by Torrey and Gray, we mentioned that both authors had, in order to ensure greater correctness in the synonymy, visited most of the large herbaria in Europe. The following paper connected with that subject, has been lately communicated by Dr Gray to the *American Journal of Science*, (Vol. xl. No. 1.) and cannot but be interesting to the readers of this journal, who may not have an opportunity of seeing the original.]

"The vegetable productions of North America, in common with those of most other parts of the world, have generally been first described by European botanists, either from the collections of travellers, or from specimens communicated by residents of the country, who, induced by an enlightened curiosity, the love of flowers, or in some instances, by no inconsiderable scientific acquirements, have thus sought to contribute, according to their opportunities, to the promotion of botanical knowledge. From the great increase in the number of known plants, it very frequently happens that the brief descriptions, and even the figures of older authors, are found quite insufficient for the satisfactory determination of the particular species they had in view; and hence it



becomes necessary to refer to the herbaria where the original specimens are preserved. In this respect, the collections of the early authors possess an importance far exceeding their intrinsic value, since they are seldom large, and the specimens often imperfect.

With the introduction of the Linnæan nomenclature, a rule absolutely essential to the perpetuation of its advantages was also established, viz., that the name under which a genus or species is first published shall be retained, except in certain cases of obvious and paramount necessity. An accurate determination of the Linnæan species is therefore of the first importance; and this, in numerous instances, is only to be attained with certainty by the inspection of the herbaria of Linnæus and those authors upon whose descriptive phrases or figures he established many of his species. Our brief notices will therefore naturally commence with the herbarium of the immortal Linnæus, the father of that system of nomenclature, to which botany, no less than natural history in general, is so greatly indebted.

This collection, it is well known, after the death of the younger Linnæus, found its way to England, from whence it is not probable that it will ever be removed. The late Sir James Edward Smith, then a young medical student, and a botanist of much promise, was one morning informed by Sir Joseph Banks, that the heirs of the younger Linnæus had just offered him the herbarium with the other collections and library of the father, for the sum of 1000 guineas. Sir Joseph Banks not being disposed to make the purchase, recommended it to Mr Smith; the latter, it appears, immediately decided to risk the expectation of a moderate independence, and to secure, if possible, these treasures for himself and his country; and before the day closed had actually written to Upsal, desiring a full catalogue of the collection, and offering to become the purchaser at the price fixed, in case it answered his expectations.\* His success, as soon

\* The next day Mr Smith wrote as follows to his father, informing him of the step he had taken, and entreating his assistance:—



appeared, was entirely owing to his promptitude; for other and very pressing applications were almost immediately made for the collection, but the upright Dr Acrel having given Mr Smith the refusal, declined to entertain any other proposals while this negotiation was pending. The purchase was finally made for 900 guineas, excluding the separate herbarium of the younger Linnæus, collected before his father's death, and said to contain nothing that did not also exist in the original herbarium; this was assigned to Baron Alstrœmer, in satisfaction of a small debt. The ship which con-

“*Honoured Sir*,—You may have heard that the young Linnæus is lately dead; his father's collections and library, and his own, are now to be sold; the whole consists of an immense hortus siccus, with duplicates, insects, shells, corals, materia medica, fossils, a very fine library, all the unpublished manuscripts; in short, every thing they were possessed of relating to natural history and physic: the whole has just been offered to Sir Joseph Banks for 1000 guineas, and he has declined buying it. The offer was made to him by my friend Dr Engelhart, at the desire of a Dr Acrel of Upsal, who has charge of the collection. Now, I am so ambitious as to wish to possess this treasure, with a view to settle as a physician in London, and read lectures on natural history. Sir Joseph Banks, and all my friends to whom I have intrusted my intention, approve of it highly. I have written to Dr Acrel, to whom Dr Engelhart has recommended me, for particulars and the *refusal*, telling him if it was what I expected, I would give him a very good price for it. I hope, my dear sir, you and my good mother will look on this scheme in as favourable a light as my friends here do. There is no time to be lost, for the affair is now talked of in all companies, and a number of people wish to be purchasers. The Empress of Russia is said to have thoughts of it. The manuscripts, letters, &c., must be invaluable, and there is, no doubt, a complete collection of all the inaugural dissertations which have been published at Upsal, a small part of which has been republished under the title of *Amœnitates Academicæ*; a very celebrated and scarce work. All these dissertations were written by Linnæus, and must be of prodigious value. In short, the more I think of this affair, the more sanguine I am, and earnestly hope for your concurrence. I wish I could have one half-hour's conversation with you, but that is impossible.”—*Correspondence of Sir James Edward Smith, edited by Lady Smith, Vol. i. p. 93.*

The appeal to his father was not in vain; and, did our limits allow, we should be glad to copy, from the work above cited, the entire correspondence upon this subject.



veyed these treasures to London had scarcely sailed, when the king of Sweden, who had been absent in France, returned home, and despatched, it is said, an armed vessel in pursuit. This story, though mentioned in the Memoir and Correspondence of Sir J. E. Smith, and generally received, has, we believe, been recently controverted. However this may be, no doubt the king and the men of science in Sweden were greatly offended, as indeed they had reason to be, at the conduct of the executors, in allowing these collections to leave the country; but the disgrace should perhaps more justly fall upon the Swedish government itself, and the University of Upsal, which derived its reputation almost entirely from the name of Linnæus. It was, however, fortunate for science that they were transferred from such a remote situation to the commercial metropolis of the world, where they are certainly more generally accessible. The late Professor Schultes, in a very amusing journal of a botanical visit to England in the year 1824, laments indeed that they have fallen to the lot of the "*toto disjunctos orbe Britannos*;" yet a journey even from Landshut to London, may perhaps be more readily performed than to Upsal.

After the death of Sir James Edward Smith, the herbarium and other collections, and library of Linnæus, as well as his own, were purchased by the Linnæan Society. The herbarium still occupies the cases which contained it at Upsal, and is scrupulously preserved in its original state, except that, for more effectual protection from the black and penetrating dust of London, it is divided into parcels of convenient size, which are closely wrapped in covers of strong paper lined with muslin. The genera and covers are numbered to correspond with a complete manuscript catalogue, and the collection, which is by no means large, in comparison with modern herbaria, may be consulted with great facility.

In the negotiation with Smith, Dr Acrel stated the number of species at 8000, which probably is not too low an estimate. The specimens, which are mostly small, but in excellent preservation, are attached to half-sheets of very



ordinary paper, of the foolscap size,\* (which is now considered too small,) and those of each genus covered by a double sheet, in the ordinary manner. The names are usually written upon the sheet itself, with a mark or abbreviation to indicate the source from which the specimen was derived. Thus, those from the Upsal garden are marked *H. U.*, those given by Kalm, *K.*, those received from Gronovius, *Gron.*, &c. The labels are all in the handwriting of Linnæus himself, except a few later ones by the son, and occasional notes by Smith, which are readily distinguished, and indeed are usually designated by his initials. By far the greater part of the North American plants which are found in the Linnæan herbarium were received from Kalm, or raised from seeds collected by him. Under the patronage of the Swedish government, this enterprising pupil of Linnæus remained three years in this country, travelling throughout New York, New Jersey, Pennsylvania and Lower Canada: hence his plants are almost exclusively those of the Northern States.†

Governor Colden, to whom Kalm brought letters of introduction from Linnæus, was then well known as a botanist, by his correspondence with Peter Collinson and Gronovius, and also by his account of the plants growing around Coldenham, New York, which was sent to the latter, who transmitted it to Linnæus for publication in the *Acta Upsalensia*. At an early period he attempted a direct correspondence with Linnæus, but the ship by which his specimens and notes were

\* Upon this subject, Dr Acrel, giving an account of the Linnæan collections, thus writes to Smith: "Ut vero vir illustrissimus, dum vixit, nihil ad ostentationem habuit, omnia vero sua in usum accommodata: ita etiam in hoc herbario, quod per XL. annos sedulo collegit, frustra quæsi-veris papyri insignia ornamenta, margines inauratas, et cet. quæ ostentationis gratia in omnibus fere herbariis nunc vulgaria sunt."

† Ex his Kalmium, naturæ eximium scrutatorem, itinere suo per Pennsylvaniam, Novum Eboracum, et Canadam, regiones Americæ ad septentrionem vergentes, trium annorum decursu dextre confecto, in patriam inde nuper reducem læti recipimus: ingentem enim ab istis terris reportavit thesaurum non conchyliorum solum, insectorum, et amphibiorum, sed herbarum etiam diversi generis ac usus, quas, tam siccas quam vivas, allatis



sent was plundered by pirates;\* and in a letter sent by Kalm, on the return of the latter to Sweden, he informs Linnæus that this traveller had been such an industrious collector, as to leave him little hopes of being himself farther useful. It is not probable therefore, that Linnæus received any plants from Colden, nor does his herbarium afford any such indication.† From Gronovius, Linnæus had received a very small number of Clayton's plants, previous to the publication of the *Species Plantarum*; but most of the species of the *Flora Virginica* were adopted or referred to other plants on the authority of the descriptions alone.

Linnæus had another American correspondent in Dr John

etiam seminibus eorum recentibus et incorruptis, adduxit.—*Linn. Amæn. Acad.* Vol. iii. p. 4.

\* Vid. Letter of Linnæus to Haller, Sept. 24, 1746.

† The *Holosteum succulentum* of Linnæus (*Alsine foliis ellipticis carnososis* of Colden, is however marked in Linnæus's own copy of the *Species Plantarum*, with the sign employed to designate the species he at that time possessed; but no corresponding specimen is to be found in his herbarium. This plant has long been a puzzle to American botanists; but it is clear from Colden's description, that Dr Torrey has correctly referred it in his *Flora of the Northern and Middle States*, (1824), to *Stellaria media*, the common Chickweed. Governor Colden's daughter seems fully to have deserved the praise which Collinson, Ellis, and others, have bestowed upon her. The latter, in a letter to Linnæus, (April, 1758,) says: "Mr Colden of New York has sent Dr Fothergill a new plant, described by his daughter. It is called *Fibraurea*, gold-thread. It is a small creeping plant, growing on bogs; the roots are used in a decoction by the country people for sore mouths and sore throats. The root and leaves are very bitter, &c. I shall send you the characters as near as I can translate them." Then follows Miss Colden's detailed generic character, prepared in a manner which would not be discreditable to a botanist of the present day. It is a pity that Linnæus did not adopt the genus, with Miss Colden's name, which is better than Salisbury's *Coptis*. "This young lady merits your esteem, and does honour to your system. She has drawn and described 400 plants in your method: she uses only English terms. Her father has a plant called after him *Coldenia*; suppose you should call this [alluding to a new genus of which he added the characters] *Coldenella*, or any other name that might distinguish her among your genera."—*Ellis, letter to Linnæus, l. c.*



Mitchell,\* who lived several years in Virginia, where he collected extensively; but the ship in which he returned to England having been taken by pirates, his own collections, as well as those of Governor Colden, were mostly destroyed. Linnæus however had previously received a few specimens, as, for instance, those on which *Proserpinaca*, *Polypremun*, *Galax*, and some other genera, were founded.

There were two other American botanists of this period, from whom Linnæus derived, either directly or indirectly, much information respecting the plants of this country, viz., John Bartram and Dr Alexander Garden of Charleston, South Carolina. The former collected seeds and living plants for Peter Collinson during more than twenty years, and, even at that early day extended his laborious researches from the frontiers of Canada, to Southern Florida, and to the Mississippi. All his collections were sent to his patron Collinson,†

\* To him the pretty *Mitchella repens* was dedicated. Dr Mitchell had sent to Collinson, perhaps as early as in the year 1740, a paper in which thirty new genera of Virginian plants were proposed. This Collinson sent to Trew at Nuremberg, who published it in the *Ephemerides Acad. Naturæ Curiosorum* for 1748; but in the mean time, most of the genera had been already published, with other names, by Linnæus or Gronovius. Among Mitchell's new genera was one which he called *Chamædaphne*: this Linnæus referred to *Lonicera*, but the elder (Bernard) Jussieu, in a letter dated Feb. 19, 1751, having shown him that it was very distinct both from *Lonicera* and *Linnæa*, and in fact belonged to a different natural order, he afterwards named it *Mitchella*.

† Mr Collinson kept up a correspondence with all the lovers of plants in this country, among whom were Governor Colden, Bartram, Mitchell, Clayton, and Dr Garden, by whose means he procured the introduction of great numbers of North American plants into the English gardens. "Your system," he writes Linnæus, "I can tell you obtains much in America. Mr Clayton and Dr Colden at Albany, on Hudson's River, in New York, are complete professors, as is Dr Mitchell at Urbana, on Rapahanock River, in Virginia. It is he that has made many and great discoveries in the vegetable world."—"I am glad you have the correspondence of Dr Colden and Mr Bartram. They are both very indefatigable, ingenious men. Your system is much admired in North America." Again, "I have but lately heard from Mr Colden. He is well, but, what is marvellous, his daughter is perhaps the first lady that has so perfectly studied your system.



until the death of that amiable and simple-hearted man, in 1768; and by him many seeds, living plants, and interesting observations, were communicated to Linnæus, but few if any dried specimens. Dr Garden, who was a native of Scotland, resided at Charleston, South Carolina, from about 1745 to the commencement of the American Revolution, devoting all the time he could redeem from an extensive medical practice to the zealous pursuit of botany and zoology. His chief correspondent was Ellis at London, but through Ellis he com-

She deserves to be celebrated."—"In the second volume of Edinburgh Essays is published a Latin botanic dissertation by Miss Colden; perhaps the only lady that makes profession of the Linnæan system, of which you may be proud." From all this, botany appears to have flourished in the North American colonies. But Dr Garden, about this time, writes thus to his friend Ellis: "Ever since I have been in Carolina, I have never been able to set my eye upon one who had barely a regard for botany. Indeed I have often wondered how there should be one place abounding with so many marks of the divine wisdom and power, and not one rational eye to contemplate them; or that there should be a country abounding with almost every sort of plant, and almost every species of the animal kind, and yet that it should not have pleased God to raise up one botanist. Strange indeed that this creature should be so rare!" But to return to Collinson, the most amusing portion of whose correspondence consists of his letters to Linnæus, shortly after the publication of the *Species Plantarum*, in which, (with all kindness and sincerity) he reproves the great Swedish naturalist for his innovations, employing the same arguments which a strenuous Linnæan might be supposed to advance against a botanist of these latter days. "I have had the pleasure," Collinson writes, "of reading your *Species Plantarum*, a very useful and laborious work. But, my dear friend, we that admire you are much concerned that you should perplex the delightful science of botany with changing names that have been well received, and adding new names quite unknown to us. Thus botany, which was a pleasant study, and attainable by most men, is now become, by alterations and new names, the study of a man's life, and none now but real professors can pretend to attain it. As I love you, I tell you our sentiments."—*Letter of April 20, 1754.* "You have begun by your *Species Plantarum*; but if you will be for ever making new names, and altering old and good ones, for such hard names that convey no idea of the plant, it will be impossible to attain to a perfect knowledge in the science of botany."—*Letter of April 10th, 1755; from Smith's Selection of the Correspondence of Linnæus, &c.*



menced a correspondence with Linnæus; and to both he sent manuscript descriptions of new plants and animals, with many excellent critical observations. None of his specimens addressed to the latter reached their destination, the ships by which they were sent having been intercepted by French cruisers; and Linnæus complained that he was often unable to make out many of Dr Garden's genera for want of the plants themselves. Ellis was sometimes more fortunate; but as he seems usually to have contented himself with the transmission of descriptions alone, we find no authentic specimens from Garden in the Linnæan herbarium.

We have now probably mentioned all the North American correspondents of Linnæus; for Dr Kuhn, who appears only to have brought him living specimens of the plant which bears his name, and Catesby, who shortly before his death sent a few living plants which his friend Lawson had collected in Carolina, can scarcely be reckoned among the number.\*

The Linnæan Society also possesses the proper herbarium of its founder and first president, Sir James E. Smith, which is a beautiful collection, and in excellent preservation. The specimens are attached to fine and strong paper, after the method now common in England. In North American botany, the chief contributors are Menzies, for the plants of California and the North-West Coast; and Muhlenberg, Bigelow, Torrey, and Boott, for those of the United States. Here also we find the cryptogamic collections of Acharius, containing the authentic specimens described in his works on the Lichens, and the magnificent East Indian herbarium of

\* In a letter to Haller, dated Leyden, Jan. 23, 1738, Linnæus writes: "You would scarcely believe how many of the vegetable productions of Virginia are the same as our European ones. There are Alps in the country of New York; for the snow remains all summer long on the mountains there. I am now giving instructions to a medical student here, who is a native of that country, and will return thither in the course of a year, that he may visit those mountains, and let me know whether the same Alpine plants are found there as in Europe." Who can this American student have been? Kuhn did not visit Linnæus until more than fifteen years after the date of this letter.



Wallich, presented some years since by the East Indian Company.

The collections preserved at the British Museum, are scarcely inferior in importance to the Linnæan herbarium itself, in aiding the determination of the species of Linnæus and other early authors. Here we meet with the authentic herbarium of the *Hortus Cliffortianus*, one of the earliest works of Linnæus, which comprises some plants that are not to be found in his own proper herbarium. Here also is the herbarium of Plukenet, which consists of a great number of small specimens, crowded, without apparent order, upon the pages of a dozen large folio volumes. With due attention, the originals of many figures in the *Almagestum* and *Amaltheum Botanicum*, &c., may be recognised, and many Linnæan species thereby authenticated. The herbarium of Sloane, also, is not without interest to the North American botanist, since many plants described in the *Voyage to Jamaica*, &c., and the *Catalogue of the Plants of Jamaica*, were united by Linnæus, in almost every instance incorrectly, with species peculiar to the United States and Canada. But still more important is the herbarium of Clayton, from whose notes and specimens Gronovius edited the *Flora Virginica*.\* Many Linnæan species are founded on the plants here described, for which this herbarium is alone authentic; for Linnæus, as we have already remarked, possessed very few of Clayton's plants. The collection is nearly complete; but the specimens were not well prepared, and are therefore not always in perfect preservation. A collection of Catesby's plants exists also in the British Museum; but probably the larger portion remains at Oxford. There is besides, among the separate collections, a small but very interesting parcel selected by the elder Bartram, from his collections made in Georgia and Florida almost a century ago, and presented to

\* *Flora Virginica, exhibens plantas quas J. Clayton in Virginia collegit.* Lugd. Bat. 8vo. 1743.—Ed. 2. 4to. 1762. The first edition is cited in the *Species Plantarum* of Linnæus; the second, again, quotes the specific phrases of Linnæus.



Queen Charlotte, with a letter of touching simplicity. At the time this fasciculus was prepared, nearly all the plants it comprised were undescribed, and many were of entirely new genera; several, indeed, have only been published very recently, and a few are not yet recorded as natives of North America. Among the latter we may mention *Petiveria alliacea* and *Ximinea Americana*, which last has again recently been collected in the same region. This small parcel contains the *Elliottia*, Muhl., *Polypteris*, Nutt., *Baldwinia*, Nutt., *Macranthera*, Torr., *Glottidium*, *Mayaca*, *Chaptalia*, *Befaria*, *Eriogonum tomentosum*, *Polygonum polygamum*, Vent., *Gardoquia Hookeri*, Benth., *Satureia* (*Pycnothymus*) *rigida*, *Cliftonia*, *Hypericum aureum*, *Galactia Elliottii*, *Krameria lanceolata*, Torr., *Waldsteinia* (*Comaropsis*) *lobata*, Torr. & Gr., the *Dolichos?* *multiflorus*, Torr. & Gr., the *Chapmannia*, Torr. & Gr., *Psoralea Lupinellus*, and others of almost equal interest or rarity, which it is much to be regretted were not long ago made known from Bartram's discoveries.

The herbarium of Sir Joseph Banks, now in the British Museum, is probably the oldest one prepared in the manner commonly adopted in England, of which, therefore, it may serve as a specimen. The plants are glued fast to half-sheets of very thick and firm white paper of excellent quality, (similar to that employed for merchants' ledgers, &c.,) all carefully cut to the same size, which is usually  $16\frac{1}{2}$  inches by  $10\frac{3}{4}$ , and the name of the species is written on the lower right-hand corner. All the species of a genus, if they be few in number, or any convenient subdivision of a larger genus, are enclosed in a whole sheet of the same quality, and labelled at the lower left-hand corner. These parcels, properly arranged, are preserved in cases or closets, with folding doors made to shut as closely as possible, being laid horizontally into compartments just wide enough to receive them, and of any convenient depth. In the Banksian herbarium, the shelves are also made to draw out like a case of drawers. This method is unrivalled for elegance, and the facility with which the specimens may be found and inspected, which to a working bo-



tanist with a large collection, is a matter of the greatest consequence. The only objection is the expense, which becomes very considerable, when paper worth at least ten dollars per ream is employed for the purpose, which is the case with the principal herbaria in England; but a cheaper paper, if it be only sufficiently thick and firm, would answer nearly as well. The Banksian herbarium contains authentic specimens of nearly all the plants of Aiton's *Hortus Kewensis*, in which many North American species were early established. It is hardly proper, indeed, that either the elder or younger Aiton should be quoted for these species, since the first edition was prepared by Solander, and the second revised by Dryander, as to vol. 1 and 2, and the remainder by Mr Brown. Many American plants from the Physic Garden at Chelsea, named by Miller, are here preserved, as also from the gardens of Collinson, Dr Fothergill, (who was Bartram's correspondent after Collinson's death,) Dr Pitcairn, &c. There are likewise many contributions of indigenous plants of the United States, from Bartram, Dr Mitchell, Dr Garden, Fraser, Marshall, and other early cultivators of botany in this country. The herbarium also comprises many plants from Labrador and Newfoundland, a portion of which were collected by Sir Joseph Banks himself; and in the plants of the northern and Arctic regions is enriched by the collections of Parry, Ross, and Dr Richardson. Two sets of the plants, collected by the venerable Menzies in Vancouver's voyage are preserved at the British Museum, the one incorporated with the Banksian herbarium, the other forming a separate collection. Those of this country are from the North-West Coast, the mouth of the Oregan river, and from California. Many of Pursh's species were described from specimens preserved in this herbarium, especially the Oregan plants of Menzies, and those of Bartram, and others from the more southern United States, which Pursh had never visited, although he often adds the mark *v. v.* (*vidi vivam*,) to species which are only to be met with south of Virginia.

The herbarium of Walter still remains in the possession of



the Fraser family, and in the same condition as when consulted by Pursh. It is a small collection, occupying a single large volume. The specimens, which are commonly mere fragments, often serve to identify the species of the *Flora Caroliniana*, although they are not always labelled in accordance with that work.

The collections of Pursh, which serve as the basis of his *Flora Americae Septentrionalis*, are in the possession of Mr Lambert, and form a part of his immense herbarium. These, with a few specimens brought by Lewis and Clark from Oregon and the Rocky Mountains, a set of Nuttall's collections on the Missouri, and also of Bradbury's, so far as they are extant, with a small number from Fraser, Lyon, &c., compose the most important portion of this herbarium, so far as North American botany is concerned. There is also a small Canadian collection made by Pursh, subsequently to the publication of his *Flora*, a considerable number of Menzies' plants, and other minor contributions. To the general botanist, probably the fine herbarium of Pallas, and the splendid collection of Ruiz and Pavon, (both acquired by Mr Lambert at a great expense,) are of the highest interest; and they are by no means unimportant in their relations to North American botany, since the former comprises several species from the North-West coast, and numerous allied Siberian forms; while our Californian plants require, in some instances, to be compared with the Chilian and Peruvian plants of the latter.

Besides the herbaria already mentioned, there are two others in London of more recent formation, which possess the highest interest as well to the general as to the American botanist, viz., that of Prof. Lindley, and of Mr Bentham. Both comprise very complete sets of the plants collected by Douglas in Oregon, California, and the Rocky Mountains, as well as those raised from seeds or bulbs, which he transmitted to England, of which a large portion have, from time to time, been published by these authors. Mr Bentham's herbarium is, probably, the richest and most authentic col-



lection in the world for *Labiatae*, and is perhaps nearly unrivalled for *Leguminosae*, *Scrophularineae*, and the other tribes to which he has devoted especial attention: it is also particularly full and authentic in European plants. Prof. Lindley's herbarium, which is very complete in every department, is wholly unrivalled in Orchidaceous plants. The genus-covers are made of strong and smooth hardware paper, the names being written on a slip of white paper pasted on the lower corner. This is an excellent plan, as covers of white paper in the herbarium of an active botanist, are apt to be soiled by frequent use. The paper employed by Dr Lindley is  $18\frac{1}{2}$  inches in length, and  $11\frac{1}{2}$  inches wide, which, as he himself remarked, is rather larger than is necessary, and much too expensive for general use.

The herbarium of Sir Wm. J. Hooker, at Glasgow, is not only the largest and most valuable collection in the world, in the possession of a private individual; but it also comprises the richest collection of North American plants in Europe. Here we find nearly complete sets of the plants collected in the Arctic voyages of discovery, the overland journeys of Franklin to the Polar Sea, the collections of Drummond and Douglas in the Rocky Mountains, Oregon, and California, as well as those of Prof. Scouler, Mr Tolmie, Dr Gardner, and numerous officers of the Hudson's Bay Company, from almost every part of the vast territory embraced in their operations, from one side of the continent to the other. By an active and prolonged correspondence with nearly all the botanists and lovers of plants in the United States and Canada, as well as by the collection of travellers, this herbarium is rendered unusually rich in the botany of this country; while Drummond's Texan collections, and many contributions from Mr Nuttall and others, very fully represent the Flora of our southern and western confines. That these valuable materials have not been buried, nor suffered to accumulate to no purpose or advantage to science, the pages of the *Flora Boreali-Americana*, the *Botanical Magazine*, the *Botanical Miscellany*, the *Journal of Botany*, the *Icones Plantarum*, and other works



of this industrious botanist abundantly testify; and no single herbarium will afford the student of North American botany such extensive aid as that of Sir Wm. Hooker.

The herbarium of Dr Arnott of Arlary, although more especially rich and authentic in East Indian plants, is also interesting to the North American botanist, as well for the plants of the *Botany of Captain Beechey's Voyage*, &c., published by Hooker and himself, as the collection of Drummond and others, all of which have been carefully studied by this sagacious botanist.

The most important botanical collection in Paris, and indeed perhaps the largest in the world, is that of the Royal Museum, at the *Jardin des Plantes* or *Jardin du Roi*. We cannot now devote even a passing notice to the garden and magnificent new conservatories of this noble institution, much less to the menagerie, the celebrated museum of zoology and anatomy, or the cabinet of mineralogy, geology, and fossil remains, which, newly arranged in a building recently erected for its reception, has just been thrown open to the public. The botanical collections occupy a portion of this new building. A large room on the first floor, handsomely fitted up with glass cases, contains the cabinet of fruits, seeds, sections of stems, and curious examples of vegetable structure from every part of the known world. Among them we find an interesting suite of specimens of the wood, and another comprising the fruits, or nuts, of nearly all the trees of this country, both collected and prepared by the younger Michaux. The herbaria now occupy a large room or hall, immediately over the former, perhaps 80 feet long, and 30 feet wide above the galleries, and very conveniently lighted from the roof. Beneath the galleries are four or five small rooms on each side, lighted from the exterior, used as cabinets for study and for separate herbaria, and above them the same number of smaller rooms or closets, occupied by duplicate and unarranged collections. The cases which contain the herbaria occupy the walls of the large hall and of the side-rooms. Their plan may serve as a specimen of that generally



adopted in France. The shelves are divided into compartments in the usual manner; but instead of doors, the cabinet is closed by a curtain of thick and coarse brown linen, kept extended by a heavy bar attached to the bottom, which is counterpoised by concealed weights, and the curtain is raised or dropped by a pulley. Paper of a very ordinary quality is generally used, and the specimens are attached, either to half-sheets or to double sheets, by slips of gummed paper, or by pins, or sometimes the specimen itself is glued to the paper. Genera or other divisions are separated by interposed sheets, having the name written on a projecting slip.

According to the excellent plan adopted in the arrangement of these collections, which is due to Desfontaines, three kinds of herbaria have been instituted, viz.: 1. The general herbarium. 2. The herbaria of particular works or celebrated authors, which are kept distinct, the duplicates alone being distributed in the general collection. 3. Separate herbaria of different countries, which are composed of the duplicates taken from the general herbarium. To these, new accessions from different countries are added, which from time to time are assorted and examined, and those required for the general herbarium are removed to that collection. The ancient herbarium of Vaillant forms the basis of the general collection; the specimens, which are all labelled by his own hand, are in excellent preservation, and among them plants, derived from Cornuti or Dr Sarrasin, may occasionally be met with. This collection, augmented to many times its original extent, by the plants of Commerson, Dombey, Poiteau, Leschenault, &c., and by the duplicates from the special herbaria, probably contains at this time thirty or forty thousand species. Of the separate herbaria, the most interesting to us is that made in this country by the elder Michaux, from whose specimens and notes the learned Richard prepared the *Flora Boreali-Americana*.

Michaux himself, though an excellent and industrious collector and observer, was by no means qualified for authorship; and it is to L. C. Richard, that the sagacious observa-



tions, and the elegant, terse, and highly characteristic specific phrases of this work are entirely due. There is also the very complete Newfoundland collection of La Pylaie, comprising about 300 species, and a set of Berlandier's Texan and Mexican plants, as well as numerous herbaria less directly connected with North American botany, which we have not room to enumerate. Here, however, we do not find the herbaria of several authors, which we should have expected. That of Lamarck, for instance, is in the possession of Prof. Roeper at Rostock, on the shores of the Baltic; that of Poiret belongs to Moquin-Tandon of Toulouse; that of Bosc, to Prof. Moretti of Pavia; and the proper herbarium of the late Desfontaines, which, however, still remains at Paris, now forms a part of the very large and valuable collections of Mr Webb. The herbarium of Mr Webb, although of recent establishment, is only second to that of Baron Delessert; the two being far the largest private collections in France, and comprising not only many older herbaria, but also, as far as possible, full sets of the plants of recent collectors. The former contains many of Michaux's plants, (derived from the herbarium of Desfontaines,) a North American collection, sent by Nuttall to the late Mr Mercier of Geneva, a full set of Drummond's collections in the United States and Texas, &c. The latter also comprises many plants of Michaux, derived from Ventenat's herbarium, complete sets of Drummond's collections, &c. But a more important, because original and perhaps complete, set of the plants of Michaux is found in the herbarium of the late Richard, now in the possession of his son Prof. Achille Richard, which even contains a few species that do not exist in the herbarium at the Royal Museum. The herbarium of the celebrated Jussieu, a fine collection, which is scrupulously preserved in its original state, by his worthy son and successor, Prof. Adrien Jussieu, comprises many North American plants of the older collectors, of which several are authentic for species of Lamarck, Poiret, Cassini, &c.

The herbarium of De Candolle at Geneva, accumulated



throughout the long and active career of this justly celebrated botanist, and enriched by a great number of correspondents, is surpassed by few others in size, and by none in importance. In order that it may remain as authentic as possible for his published works, especially the *Prodromus*, no subsequent accessions to families already published are admitted into the general herbarium, but these are arranged in a separate collection. The proper herbarium, therefore, accurately exhibits the materials employed in the preparation of the *Prodromus*, at least so far as these were in Prof. De Candolle's own possession. As almost twenty years have elapsed since the commencement of this herculean undertaking, the authentic herbarium is of course much less rich in the earlier than in the later orders. The *Compositæ*, to which seven years of unremitted labour have been devoted, form themselves an herbarium of no inconsiderable size. It is unnecessary to enumerate the contributors to this collection, (which indeed would form an extended list,) since the author, at least in the later volumes of the *Prodromus*, carefully indicates, as fully as the work permits, the sources whence his materials have been derived. The paper employed is of an ordinary kind, somewhat smaller than the English size, perhaps about fifteen inches by ten; and the specimens are attached to half-sheets by loops or slips of paper fastened by pins, so that they may readily be detached, if necessary, for particular examination. Several specimens from different sources or localities, or exhibiting the different varieties of a species, are retained when practicable; and each species has a separate cover, with a label affixed to the corner, containing the name and a reference to the volume and page of the *Prodromus* where it is described. The limits of genera, sections, tribes, &c., are marked by interposed sheets, with the name written on projecting slips. The parcels which occupy each compartment of the well-filled shelves, are protected by pieces of binder's board, and secured by a cord, which is the more necessary as the cases are not closed by doors or curtains.



The royal Bavarian herbarium at Munich, is chiefly valuable for its Brazilian plants, with which it has been enriched by the laborious and learned Martius. The North American botanist, will, however, be interested in the herbarium of Schreber, which is here preserved, and comprises the authentic specimens described or figured in his work on the grasses, the American specimens mostly communicated by Muhlenberg. The *Gramineæ* of this and the general herbarium, have been revised by Nees von Esenbeck, and still later, by Trinius. It was here that the latter, who for many years had devoted himself to the exclusive study of this tribe of plants, and had nearly finished the examination of the chief herbaria of the continent, preparatory to the publication of a new *Agrostographia*, was suddenly struck with a paralysis, which has probably brought his scientific labours to a close.

The Imperial herbarium of Vienna, under the superintendence of the accomplished Endlicher, assisted by Dr Fenzl, is rapidly becoming one of the most valuable and extensive collections in Europe. The various herbaria of which it is composed, have recently been incorporated into one, which is prepared nearly after the English method. It however possesses few North American plants, except a collection made by Enslin, (a collector sent to this country by Prince Lichtenstein, from whom Pursh obtained many specimens from the Southern States,) and some recent contributions by Hooker, &c. There is also an imperfect set of the plants collected by Hænke, (a portion of which are from Oregon and California,) so far as they are yet published in the *Reliquiæ Hænkeanæ* of Presl, in whose custody, as curator of the Bohemian museum at Prague, the original collection remains.

The herbarium of the late Prof. Sprengel still remains in the possession of his son, Dr Anthony Sprengel, at Halle, but is offered for sale. It comprises many North American plants, communicated by Muhlenberg and Torrey. The herbarium of Schkuhr was bequeathed to the university of



Wittemberg, and at the union of this university with that of Halle, was transferred to the latter, where it remains under the care of Prof. Von Schlechtendal. It contains a large portion of the *Carices* described and figured in Schkuhr's work, and is therefore interesting to the lovers of that large and difficult genus. The American specimens were mostly derived from Willdenow, who obtained the greater portion from Muhlenberg.

The royal Prussian herbarium is deposited at Schöneberg, (a little village in the environs of Berlin,) opposite the royal botanic garden, and in the garden of the Horticultural Society. It occupies a very convenient building erected for its reception, and is under the superintendence of Dr Klotzsch, a very zealous and promising botanist. It comprises three separate herbaria, viz., the general herbarium, the herbarium of Willdenow, and the Brazilian herbarium of Sello. The principal contributions of the plants of this country to the general herbarium, garden-specimens excepted, consist of the collections of the late Mr Beyrich, who died in Western Arkansas while accompanying colonel Dodge's dragoon expedition, and a collection of the plants of Missouri and Arkansas, by Dr Engelmann, now of St Louis; to which a fine selection of North American plants, recently presented by Sir William Hooker, has been added. The botanical collections made by Chamisso, who accompanied Romanzoff in his voyage round the world, also enrich this herbarium; many are from the coast of Russian America and from California; and they have mostly been published conjointly by the late Von Chamisso and Prof. Schlechtendal in the *Linnæa*, edited by the latter.

The late Professor Willdenow enjoyed for many years the correspondence of Muhlenberg, from whom he received the greater part of his North American specimens, a considerable portion of which are authentic for the North American plants of his edition of the *Species Plantarum*. In addition to these, we find in his herbarium many of Michaux's plants, communicated by Desfontaines, several from the German collector,



Kinn, and perhaps all the American species described by Willdenow from the Berlin garden. It also comprises a portion of the herbarium of Pallas, the Siberian plants of Stephen, and a tolerable set of Humboldt's plants. This herbarium is in good preservation, and is kept in perfect order and extreme neatness. As left by Willdenow, the specimens were loose in the covers, into which additional specimens had sometimes been thrown, and the labels often mixed, so that much caution is requisite to ascertain which are really authentic for the Willdenovian species. To prevent farther sources of error, and to secure the collection from injury, it was carefully revised by Prof. Schlechtendal, while under his management, and the specimens attached by slips of paper to single sheets, and all those that Willdenow had left under one cover, as the same species, are enclosed in a double sheet of neat blue paper. These covers are numbered continuously throughout the herbarium, and the individual sheets or specimens in each are also numbered, so that any plant may be referred to by quoting the number of the cover, and that of the sheet to which it is attached. The arrangement of the herbarium is unchanged, and it precisely accords with this author's edition of the *Species Plantarum*. Like the general herbarium, it is kept in neat portfolios, the back of which consists of three pieces of broad tape, which, passing through slits near each edge of the covers, are tied in front; by this arrangement their thickness may be varied at pleasure, which, though of no consequence in a stationary herbarium, is a great convenience in a growing collection. The portfolios are placed vertically on shelves protected by glass doors, and the contents of each are marked on a slip of paper fastened to the back. The herbaria occupy a suite of small rooms distinct from the working rooms, which are kept perfectly free from dust.

Another important herbarium at Berlin, is that of Prof. Kunth, which is scarcely inferior in extent to the royal collection at Schöneberg, but it is not rich or authentic in the plants of this country. It comprises the most extensive and





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