

FIRST PART.
INTROD. LEXICON, &c.

NEW FLORA
AND BOTANY

OF

NORTH AMERICA.

BEING A SUPPLEMENTAL FLORA,

To the various Floras and Botanical Works of Michaux, Muhlenberg, Pursh, Nuttall, Elliot, Torrey, Beck, Eaton, Bigelow, Barton, Robin, Hooker, Riddell, Darlington, Schweinitz, Gibbs, &c.

Besides the general works of Linneus, Willdenow, Vahl, Vitman, Persoon, Lamark, Decandole, Sprengel, Jussieu, Adanson, Necker, Lindley, &c. Containing nearly 500 additional or revised New Genera, and 1500 additional or corrected New Species, illustrated by figures in *AUTIKON BOTANIKON*.

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Member of many learned Societies in Paris, Vienna, Bonn, Bruxelles, Bordeaux, Zurich, Naples, &c. and in Philadelphia, New York, Cincinnati, Lexington, &c.

The Floral wealth in this wide land concealed,
Will be at last by learned care revealed.

PHILADELPHIA:

PRINTED FOR THE AUTHOR AND PUBLISHER.

1836.



WILLIAM
DUNN
VOLUME

DEDICATION.



To all my fellow **BOTANISTS** in the United States of North America, and chiefly to those who are endeavoring to complete and illustrate our Botany—I **DEDICATE** these pages, results of 24 years of observations and researches.

But above all, to my friends, colleagues, or contributors now living, and to the memory of the worthy departed, Elliot, Collins, Schweinitz, Pursh, Conrad, Bradbury . . . in grateful remembrance of their worth and kind help. **D. D. D.**

PHILADELPHIA, September, 1836.

THE AUTHOR.

NEW YORK
BOTANICAL
INTRODUCTION.
LIBRARY

After many years of active researches in the continent of North America, I was meditating to write a new Flora of it; but was long dubious in what form to produce it. To enumerate and describe all the plants of this vast region in a proper form and natural classification, would be a very acceptable labor, but a very arduous task, to which, altho' I felt quite competent, it was not possible to think of, owing to the expense of it, particularly if many figures were given. All our Botanists have shrunk from this undertaking, except Hooker in his Flora of Canada and Boreal America, now publishing by the help of patronage. Zeal alone does not avail in this as in collecting, other pecuniary means are required.

It has been found more practicable and nearly as useful by our Botanists to publish abridged Floras on the Linnean plan, of which Michaux and Pursh gave the example; while Nuttall, Torrey, Eaton, Beck, &c. have followed nearly the same path. Elliot alone has somewhat enlarged his labor, and produced a most egregious work.

None but such condensed or compiled works on our Botany, have been found acceptable to all and saleable; while the elaborate and learned works, full of discoveries and ample researches, can only be appreciated by a few, and even often excite the envy of the learned rivals.

Under such predicament, I was compelled to decide upon a middle course; and I therefore undertook this work as a Supplemental Flora of North America, a kind of mantissa and appendix to all my predecessors, avoiding thereby much expense and trouble in accumulating all the scattered materials and fragments already published: altho' I endeavored to collect them whenever I had to frame some peculiar careful monographs of neglected Genera or families. The illustration by figures of my New Genera and New Species will be kept apart in mpt. to be sold apart to any institution or individual that wish to possess them, as well as my botanical specimens, general Herbarium, and original typical sets collected together under the name of my **AUTIKON BOTANIKON**.

I have called this work, a *New Flora of North America*, and such it is in fact: a real **FLORA**, although not classed by the false sexual system, nor even my own improved natural method, but arranged differently. I do not even know yet exactly how it will be gone through; but I propose to commence by a sample of a *Lexicon* to be contrasted with the manual *Lexicon* of Eaton, and go on with monographs of interesting Genera or Families, with a *SYLVA* of my New Trees and Shrubs, a *Neogenyton* or account of New Genera, and a *Neobotanon* or compendium of new species. I may, however, deviate from this plan if needful or desirable, and I hope to conclude the whole by a general Index, both alphabetical and classified naturally of all the Families and Genera.

While I was preparing this work, I found myself so often perplexed and involved into difficulties, by the actual improper framing of Ge-

nera, that I was compelled to take up the subject of Generic reform simultaneously with this new flora. This has greatly increased my labors and delayed the publication; but vastly enlarged my field of botanical researches, now based on generic accuracy.

In fact till lately most of the Botanists, both here and elsewhere, were perfectly satisfied with the Linnean Genera, and thought they had done their utmost when they referred the Linnean or new species, *quite at random* to those Linnean Genera; often avoiding or neglecting to notice their peculiar floral characters, not seldom at variance with the Genera referred to. The labors of Adanson, Jussieu, Necker, Moench, Lamark, &c. upon generic reforms were often overlooked or neglected. At last a better feeling has been prevailing, and the modern improvers Decandole, Agardh, Robert Brown, Lindley, &c. have restored many of the old Genera, or further corrected generic nomenclature.

As I rank among these botanical reformers ever since 1808 when I first published new Genera, and 1815 when I published the outlines of my reformed Natural Families, it was just and proper that I should resume these investigations, now that I mean to give the results of a whole life of botanical travels, discoveries and arduous researches. This shall then be done in a colateral work published at the same time, but kept apart, which I shall call *Flora telluriana* or synoptical mantissa of 2000 new families, Genera and species of plants of the whole earth. There most of my generic and other reforms will be elucidated, and I shall merely refer to them in this N. Amer. Flora.

Here, the new species of this continent shall be chiefly attended to. They are often in as great a disorder as the Genera; many are occasionally blended into one, or improperly determined and settled. To give their synonymy is not always an easy task, nor are the varieties to be overlooked. Many botanists mistake real botanical species for varieties or viceversa. In fact all species might have been varieties once, and many varieties are gradually becoming species by assuming constant and peculiar characters. This is an interesting feature of botanical philosophy, which I shall properly explain and prove hereafter.

This new Flora is very far, therefore, from being a compilation of former labors: it is quite an original work, chiefly based upon my individual researches and discoveries, during 36 years of botanical travels and exertions, whereof 24 were spent in North America, the main field of my scientific rambles and labors.

It may perhaps be useful to give here an outline of my botanical travels in North America, whereby it will be perceived that I have surveyed and examined more States and regions than any other Botanist perhaps except Nuttall. Thus I was enabled to detect a great number of New Species, and examine many plants alive in full bloom in their native wilds. It would be well if botanical writers would thus detail us their actual excursions and explorations.

Some plants are quite local or have very narrow limits of growth, others are only in bloom for a few hours or days. Many early vernal plants of the Genera *Dodecatheon*, *Clintonia*, *Vernasolis*, *Viola*, *Peltandra*, *Cypripedium*, &c. can only be seen in narrow localities during

the month of May. Others of the Genera *Gentiana*, *Kuhnia*, *Eclipta*, *Spiranthes*, *Aster*, *Solidago*, with many radiate Genera, are quite late and autumnal, found chiefly in October: therefore they had escaped the notice of our Botanists, who chiefly botanize or travel in summer.

Other plants are confined to Mountains, or Pinelands, or Western Glades, or deep Swamps, which must be visited by turns, if we wish to collect them. I have sometimes looked in vain for years for some particular plants, at the very places where they are known to grow, because I was not in the due season: this happens to all Botanists, and it is very important for collectors to know the precise epoch of blooming and seeding. What escapes one of them may be met by another a little earlier or later. There are besides years when some plants bloom more abundantly, and others like the *Miegia*, *Enslenia*, &c. only bloom once in many years.

I came to North America in 1802, and travelled chiefly on foot until 1804, over New Jersey, Pennsylvania, Delaware, Maryland, and Virginia, from the Juniata to the Sea Shore, and from the Alleghany Mountains beyond Easton, to the Potomac beyond Washington and Alexandria. Some of the results of my discoveries in those three years of early travels were published in 1808.

In 1805 I left America for Europe, where I remained till 1815. On my return to this continent in that year, I was shipwrecked on the shores of Connecticut, and lost all my former Herbals and collections, both American and European.

Therefore being deprived of all my first labors in Botany, Zoology, and Mineralogy in that memorable year 1815, I had to begin again my researches and collections, which I pursued ever since with renewed zeal, always at my own sole expense. I spent 1815 and 1816 in the States of New York, New Jersey, and Pennsylvania chiefly. In 1816 I went to explore as far as Lake Champlain, Vermont, and the Saranac Mountains, near the sources of the Hudson River. In 1817 I went to the Mattawan and Kiskatom, or Catskill Mountains, and explored Long Island, where I dwelt awhile.

But my great travels in the West began in 1818, I made a tour of 2000 miles as far as the Wabash River, crossing twice the Alleghany Mountains on foot, and exploring Ohio, Indiana, Illinois, Kentucky, &c. Some of the results of my former discoveries in that journey were published in 1819, in the *Physical Journal of Paris*, in 80 new Gen. of Plants, and 70 New Gen. of Animals.

Having been appointed Professor of Natural Sciences in the University of Lexington, in Kentucky, I went there in 1819, crossing a third time the Alleghany Mountains, through the Cumberland road of Maryland, still on foot, as I never would cross these beautiful mountains in any other way, in order to botanize all the while, and I was rewarded by many new plants.

I spent seven years in Kentucky in 1826, exploring that State thoroughly, and making excursions to Ohio, &c., my longest journeys were in 1823, when I went West as far as the Rivers Cumberland and Tennessee near their

mouths, and next East to the falls of the Cumberland River and the Washto or Cumberland mountains.

In 1825 I undertook a long journey through Ohio, and Virginia, crossing the Alleghany mountains of Virginia, and returning by the Alleghanies of Pennsylvania, always on foot. Next year, 1826, I left Kentucky and settled in Philadelphia: but took a very long botanical journey in the way, going through Ohio to Sandusky on Lake Erie; thence to Buffalo, Niagara, Canada, the New York Canal, &c.

My excursions in 1827, were to the Sea Shores of New Jersey, and thence to Troy, the Taconick mountain, and through Massachusetts to Boston, returning by a different road. In 1828, I went to the Alleghany mountains of the North on the Lehigh, the Schooley mountains of New Jersey, and Mattawan mountains of New York. In 1829, I went to the Pine-barrens of New Jersey, and as far as Connecticut. In 1830, I made a second journey to the Kiskatom mountains of New York.

Several botanical excursions and journeys were undertaken in 1831, in Delaware, New Jersey, and the Taconick mountains. While in 1832 I visited Maryland twice, the second time I explored the Cotocton mountains of Maryland, and Alleghany mountains as far as Sherman Valley and the Juniata, quite at leisure, residing some times at the top of the mountains.

In the year 1833 I proposed to visit the Apalachian mountains as far as Alabama: but was prevented by an accident and heavy rains; I only went as far as those of Virginia, and again in the Cotocton mountains.—In a second

journey I undertook to visit the sources of the river Delaware, and Susquehannah, exploring first the Pine barrens and Sea shores of New Jersey, next going from Albany over the Heidelberg mountains to the Lake Utsiantha source of the Delaware at the foot of the Kiskatom mountains, and Lake Otsego source of the Susquehannah.

The year 1834 saw me twice in the Alleghany mountains of the north, once by following the course of the Delaware, the second time westward by the Welsh mountains, Conewago mountains, Albany mountains, Locust mountains to the Pottsville mines and the source of the Schuylkill river, returning by Mauchchunk and Allentown.

My travels of 1835 were in the Central Alleghanies up the River Juniata and Susquehannah, exploring the mountains of Peters, Buffalo, Wiconisco, Mahantango, Tuscarora, Jack, Seven mountains, &c. with their Valleys. An account of all these travels and excursions is given by me more at length in my *Life of travels and researches*, published early in 1836. Since then I have chiefly explored South New Jersey and the pine barrens.

Although these journeys were often undertaken with the additional ulterior view to collect Fossils and Animals, my favorite science and pursuit of Botany was always my main object. I always travelled with my botanical collecting book and reams of paper to preserve my plants: and thus I have been enabled to collect in 20 years, since 1816, a most valuable Herbarium, rich in new species, rare plants, and complete Monographs; which have been increased by exchanges and purchases, chiefly of

Southern plants; not having been able to explore as yet the Southern States, deterred by the bad roads, unhealthy climate, scanty fare, heavy expenses and state of society. A pedestrian Botanist is not always very welcome there.

During so many years of active and arduous explorations, I have met of course all kinds of adventures, fares and treatment. I have been welcomed under the hospitable roof of friends of knowledge or enterprise, else laughed at as a mad Botanist by scornful ignorance. Often deemed a herbalist and wandering doctor by the vulgar, I have allowed or indulged this harmless belief, and thereby elicited from many quarters the local knowledge of medical facts, which I have published in my Medical Flora of the United States.

I have seldom met with liberal enlightened men, who could believe that I was actuated by the pure love of knowledge and science; yet I have found such worthy men sometimes and their names are gratefully impressed on my memory. Such were J. D. Clifford, Alex. Walsh, Mess. Knevels, Adlum, Dr. Schultz, D. Jackson, H. Clay, Clinton, Meade, Maclane, Wells, Thompson, Aldie, &c. who without being Botanists, or at most mere florists, could appreciate my pursuits and facilitate my researches. As to Botanists and Zooligists I made it a point to search for them and enjoy their society, mutually imparting our knowledge.

Such a life of travels and exertions has its pleasures and its pains, its sudden delights and deep joys mixt with dangers, trials, difficulties, and troubles. No one could better paint them than myself, who has experienced them all; but

I must be brief in conveying a slight idea of them.

Let the practical Botanist who wishes like myself to be a pioneer of science, and to increase the knowledge of plants, be fully prepared to meet dangers of all sorts in the wild groves and mountains of America. The mere fatigue of a pedestrian journey is nothing compared to the gloom of solitary forests, when not a human being is met for many miles, and if met he may be mistrusted; when the food and collections must be carried in your pocket or knapsack from day to day; when the fare is not only scanty but sometimes worse; when you must live on corn bread and salt pork, be burnt and steamed by a hot sun at noon, or drenched by rain, even with an umbrella in hand, as I always had.

Musquitoes and flies will often annoy you or suck your blood if you stop or leave a hurried step. Gnats dance before the eyes and often fall in unless you shut them; insects creep on you and into your ears. Ants crawl on you whenever you rest on the ground, wasps will assail you like furies if you touch their nests. But ticks the worst of all are unavoidable whenever you go among bushes, and stick to you in crowds, filling your skin with pimples and sores. Spiders, gallineps, horse-flies and other obnoxious insects will often beset you, or sorely hurt you. Hateful snakes are met, and if poisonous are very dangerous, some do not warn you off like the Rattle-snakes.

You meet rough or muddy roads to vex you, and blind paths to perplex you, rocks, mountains, and steep ascents. You may often lose your way, and must always have a compass

with you as I had. You may be lamed in climbing rocks for plants or break your limbs by a fall. You must cross and wade through brooks, creeks, rivers, and swamps. In deep fords or in swift streams you may lose your footing and be drowned. You may be overtaken by a storm, the trees fall around you, the thunder roars and strikes before you. The winds may annoy you, the fire of heaven or of men sets fire to the grass or forest, and you may be surrounded by it, unless you fly for your life.

You may travel over a unhealthy region or in a sickly season, you may fall sick on the road and become helpless, unless you be very careful, abstemious and temperate.

Such are some of the dangers and troubles of a botanical excursion in the mountains and forests of North America. The sedentary botanists or those who travel in carriages or by steamboats, know little of them; those who merely herborize near a city or town, do not appreciate the courage of those who brave such dangers to reap the botanical wealth of the land, nor sufficiently value the collections thus made.

Yet although I have felt all those miseries, I have escaped some to which others are liable. I have never been compelled to sleep at night on the ground, but have always found a shelter. I have never been actually starved, nor assailed by snakes or wild beasts, nor robbed, nor drowned, nor suddenly unwell. Temperance and the disuse of tobacco have partly availed me, and always kept me in health.

✓ In fact I never was healthier and happier than when I encountered those dangers, while a

✓ sedentary life has often made me unhappy or unwell. I like the free range of the woods and glades, I hate the sight of fences like the Indians! The free constant exercise and pleasurable excitement is always conducive to health and pleasure.

The pleasures of a botanical exploration fully compensate for these miseries and dangers, else no one would be a travelling Botanist, nor spend his time and money in vain. Many fair-days and fair-roads are met with, a clear sky or a bracing breeze inspires delight and ease, you breathe the pure air of the country, every rill and brook offers a draught of limpid fluid. What delight to meet with a spring after a thirsty walk, or a bowl of cool milk out of the dairy! What sound sleep at night after a long day's walk, what soothing naps at noon under a shaded tree near a purling brook!

✓ Every step taken into the fields, groves, and hills, appears to afford new enjoyments, Landscapes and Plants jointly meet in your sight. Here is an old acquaintance seen again; there a novelty, a rare plant, perhaps a new one! greets your view: you hasten to pluck it, examine it, admire, and put it in your book. Then you walk on thinking what it might be, or may be made by you hereafter. You feel an exultation, you are a conqueror, you have made a conquest over Nature, you are going to add a new object, or a page to science. This peaceful conquest has cost no tears, but fills your mind with a proud sensation of not being useless on earth, of having detected another link of the creative power of God.

Such are the delightful feelings of a real botanist, who travels not for lucre nor paltry pay.

Those who do, often think only of how much the root or the seed or the specimen will fetch at home or in their garden.

✓ When you ramble by turns in the shady groves, grassy glades, rocky hills, or steep mountains, you meet new charms peculiar to each; even the gloomy forest affords a shady walk. Every rock, nook, rill . . . has peculiar plants inviting your attention. When nothing new nor rare appears, you commune with your mind and your God in lofty thoughts or dreams of happiness. Every pure Botanist is a good man, a happy man, and a religious man! He lives with God in his wide temple not made by hands

To these botanical pleasures may be added the anticipation of the future names, places, uses, history, &c. of the plants you discover. For the winter or season of rest, are reserved the sedentary pleasures of comparing, studying, naming, describing and publishing. A time may come, when if all plants are well known, little will be left to be done, except seeking rare plants or occasional deviations and varieties; but a long while will elapse before this may take place, since so few of our plants are completely known as yet. Then will begin the labors of the draftsman, the collector of rare plants and roots, or the seeking of special and generic deviations.

In this another wide field of researches will be open to the enquiring mind. My thoughts have often been led thereto when noticing singular deviations. I admit like Adanson, Necker and Linneus himself that plants do vary gradually and constantly, although often very slowly, both in the specific and generic

characters. I refer to these authors for examples so often met in gardens; but I have chiefly attended to this in the woods and fields where quite spontaneous.

The process is by the seedlings being somewhat different from the parents, and thus evincing a deviation of typical mould, that may be, or may not be, propagated again. If it is, this soon assumes a permanence, becoming a permanent variety if the deviation is slight, such as mere color of flowers, size of stem, leaves, &c.; but becoming a New Species! if at last several deviations are permanently combined. A tendency to such deviations is sometimes met even in the various annual shoots of the perennial plants, or shrubs and trees, that are not always alike to those of the preceding years.

The specific deviations which I could mention are numberless, this work will be full of them, as all new species are in fact such permanent deviations of growth, unless they are widely different from all former species. The oldest type of the species may probably be found in the most common with most numerous individuals, while those called rare or with few individuals as yet must be the newest in order of time.

Generic deviations are more rarely observed or noticed, because less evident and very slowly produced, or not so easily propagated; but I shall mention here some very striking instances of them; while many more are to be met with in all the Genera, where the characters are polymorphous, expressed by SO...OR....SO, 3-5 fidis, 4-5 andris, 3-4 stylis, Capsule with 4 or 5 valves, one or many seeds, &c.

1. I have seen in a garden a Tulip with 5

petals only and 5 stamens. That was even a deviation from the family!

2. I have met with a *Tecoma* bearing a capsule with 3 valves, the generic character is bivalve.

3. *Asters* and *Solidagos* with the ligules mixt with the florets, forming a kind of peloric genus which I have called *Mictanthes*.

4. The *Aster discoideus* of Elliot or my genus *Anactis*, has no rays, it must have been a deviated genus like *Eclipta* from *Verbesina*. I have met some *Asters* with the rays so shortened as to be almost invisible.

5. My *G. GONONCUS* has two sorts of flowers and seeds on the same plant, uniting the characters of *Polygonum* and *Persicaria*.

6. My *G. Styrandra* appears to have originated once from *Convallaria* or rather *Majanthemum*, just like *Paris* from *Trillium*.

7. Many monoical and dioical plants return to Polygamy and hermaphroditism. This is the case with some of our Vines, *Vitis*, *Morus*, *Urtica*, *Callitriche*, &c.

8. Nothing more common than monstrous deviations by addition or deficiency of parts, which are as many links of generic variations.

Of all the European Floras, that in which generic and specific deviations are most explicitly stated and best detailed, is the Flora Lithuanica of Gilibert, where many similar anomalies may be noticed.

Therefore the result will be that our species and genera are not quite permanent as supposed, but are gradually producing deviations of forms; when these are floral they are of course

generic, and may after centuries form New Genera.

Hybridity also multiplies species: this process is much more common in plants than animals; but it is often difficult to detect in the wild plants the real parents. Unless they are both found growing near the hybrid, and it has the traces of both forms, we may as safely ascribe it to a natural deviation of frame, called Peloric if floral and generic.

Some Botanists have different ideas of Genera, species, and varieties: their errors and my corrections will be found in the principles of my FLORA TELLURIANA. I merely recapitulate here my ideas of them, deduced from 40 years of botanical observations.

SPECIES include all the individuals perfectly alike in all their parts—*Varieties* are slight casual deviations—*Proles* are permanent varieties, such as are called *Breeds* among animals.

GENERA are the groups of species that have similar floral characters and sometimes a similar habit. Whenever a species has different floral forms it must be a peculiar genus.

Such are the natural distinctions of those two groups, any others must be unnatural and improper! All species may have been varieties once, except the original types or ancestors of the genus, and all actual varieties may be incipient species.

My views of the natural method will be given in my FLORA TELLURIANA, where I shall correct and improve my former classes, orders and families of 1815 in *Analysis of Nature*. I have adopted and studied the natural method since 1800, I have always tried to improve it,

I have always been opposed to the Linnean system and its blunders; but the natural method has had so long, and has perhaps yet, so many anomalies, that unless they are rectified, the study of affinities will be impeded. Jussieu had a crowd of genera *incerta sedis*, or annexed to orders without belonging thereto, which were a Dedalus of ambiguity. The modern Decandole, Richard, Lindley, Agardh have partly improved this Labyrinth; but the clue to guide us is now in our hands! Let every genus that does not agree in general frame and characters be removed, and placed elsewhere, as I have done. When this is done and generally adopted we may hope to reach a perfect classification: while that of Lindley for instance, is as yet quite loose and inaccurate, as bad as Adanson or Necker's; since one fourth of his genera do not agree to the common characters ascribed, and some orders have none at all . . .

This is the ambiguity and absurdity carried from Species and Genera to the National Orders! unless restricted or exploded in all instances, we can have no correct nomenclature nor classification. What absurdity to have an order without *definition*, like the patched genera *Gentiana* and *Convallaria* for instance! a false definition that does not apply to all the Genera or Species, is equal to no definition at all . . .

Our North American Botanists were very late in noticing the natural method, and even now hardly admit of it, or else without restriction on its defects. . . From 1802 to 1804 I was perhaps the only one that followed that new path, Barton, Muhlenberg, and others of that

with flowers however and carefully examined generically; although it is not always easy to see well the minute floral characters of dry specimens. As to the inside of the seeds, their fallacious anatomical structures never perplex me; I leave them to Anatomists with the inside of roots and fibres: microscopical observations are always useless for practical descriptive Botany, as all genera and families have outward evident floral forms peculiar to each.

When plants have not been seen actually alive or dry, I quote as usual the books, authors or figures, that have imparted their knowledge; but few such plants will however be mentioned here, this being rather intended as a collection of my own observations: yet in complete monographs or revised Genera it will be needful to compare all the species and facts. It is to be regretted that our botanists too often neglect the labors of their colleagues, by not comparing all previous or proposed species: whereby they can only give us imperfect monographs.

Several authors have mistaken foreign plants of distant regions for our own. Many such are found in Thunberg, Gmelin, Loureiro, &c. that are different species from Japan, Sibiria or Anam. Decandole has recommended to compare again every plant deemed native of several remote regions, and I shall often do it.