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ADVERTISEMENT.

This work is the twenty-sixth of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

SPENCER F. BAIRD,

Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,

Washington, July 1, 1881.

GUIDE

TO

THE FLORA

OF

WASHINGTON AND VICINITY.

BY

LESTER F. WARD, A. M.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1881.

PREFACE.

The outline of this work was presented as a communication to the Philosophical Society of Washington, January 22, 1881. The aim of the writer was to furnish a guide to botanists in exploring the locality and an aid to beginners in practical botany. To this latter class the Appendix is especially addressed, but as it is equally applicable to other localities, and as nothing, it is believed, analogous to it has been published, it may be found useful outside of Washington. The introduction also contains suggestions which, if followed in a sufficient number of localities by those preparing local catalogues, would greatly aid in making the botanists of the country acquainted with the geographical distribution of plants throughout the United States and the special peculiarities of certain regions.

The manifest imperfections of the treatise may not be without their uses in stimulating local collectors and others to correct them and produce something better.

In the investigation of the flora of Washington, so many able and active botanists and so many energetic amateurs have co-operated that it would almost seem invidious to single out any as the subjects of special thanks, and it has been deemed the most equitable plan to give special credit to the first discoverer of each rare plant, wherever this can be known, under its proper head in the detailed enumeration. I cannot, however, refrain from expressing my special obligations to Dr. George Vasey, Botanist to the Department of Agriculture, for his kindness in placing the National Herbarium at my disposal and in examining and reporting upon many critical and puzzling forms, especially in the Cyperaceæ and Gramineæ. I also desire to acknowledge in an especial manner the valuable services of Mr. M. S. Bebb, of Rockford, Ill., in identifying the local Salices, which, though comparatively few, are very interesting and in a high degree confusing to any but a trained specialist like Mr. Bebb.

Prof. J. W. Chickering, jr., of the Columbia Deaf and Dumb Institute, in addition to much other valuable assistance, has kindly looked over the proofs as they came from the press and suggested many important additions and improvements, for which service my special thanks are due.

L. F. W.

WASHINGTON, *December* 25. 1881.

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I. INTRODUCTORY REMARKS.

This monograph has resulted from a suggestion made to the writer in the spring of 1880 by a member* of the Committee on Publications of the Philosophical Society of Washington, relative to the preparation of a revised catalogue of the plants of this vicinity. While there now exists a provisional catalogue, containing most of the species which have been collected or observed by botanists during the past six or seven years, it consists of so many small annual accretions, due to constant new discoveries, and contains withal so many blemishes and imperfections incident to its hasty compilation and irregular growth, that it has ceased in great part to meet the demands of the present time. The elaboration of a systematic catalogue of the local flora was not, however, at the outset at all contemplated, but merely the presentation of certain notes and special observations on particular species, which had been made in the course of some nine years of pretty close attention to the vegetation and somewhat varied and exhaustive field studies in this locality. The flowering-time of most species here is much earlier than that given in the manuals, and is, moreover, in many cases, very peculiar and anomalous, rendering it important to collectors, as well as interesting to botanists, to have it definitely stated for a large proportion of the plants. It being thus necessary to extend the enumeration so far, it was thought that the remainder might as well be added, thus rendering it a complete catalogue of all the vascular plants known to exist here at the present time. To these has been appended the list of *Musci* and *Hepaticæ* prepared by the late Mr. Rudolph Oldberg for the *Flora Columbiana*, which is inserted unchanged, except in so far as was required to make it conform strictly to the work of Sullivant, which has long been the standard for this country.

* Prof. Cleveland Abbe.

Dr. E. Foreman has also furnished the names of a few of the *Characeæ* collected here by himself, and named by Professor Farlow of Cambridge, which, in the present unsettled state of the classification of the Cryptogams, have for convenience been placed at the foot of the series.

In undertaking this compilation I have endeavored to resist the usual temptation of catalogue-makers to expand their lists beyond the proportions which are strictly warranted by the concrete facts as revealed by specimens actually collected or species authentically observed, but have been content to set down only such as I can either personally vouch for or as are vouched for by others who have something more substantial than memory to rely upon, preferring that a few species actually occurring, but not yet seen, should be omitted and afterwards supplied, rather than that others supposed to exist, but which cannot be found, should stand in our flora to be apologized for to those who would be glad to obtain them. A few species, however, which are positively known to have once occurred within our limits, but which have been obliterated in the course of the constant changes taking place, have been retained, as well as several of which only a single specimen has been found; but in all such cases the facts are fully stated in the notes accompanying each plant.

II. RANGE OF THE LOCAL FLORA.

The extent of territory which has of late years been tacitly recognized by botanists here as constituting the area of what has been called the "Flora Columbiana" is limited on the north by the Great Falls of the Potomac, and on the south by the Mount Vernon Estate, in Virginia, and Marshall Hall, just opposite this on the Maryland side of the river, while it may reach back from the river as far as the divide to the east, where the waters fall into the Chesapeake Bay, and as far westward as the foot of the Blue Ridge, so as not to embrace any of the peculiarly mountain forms. Practically, however, the east and west range is much less than this, and only extends a few miles in either direction. The only three cases in which these limits are overstepped in this catalogue are in including: 1. *Draba ramosissima*, not yet collected this side of Harper's Ferry, but which may be confidently looked for; 2. *Filago Germanica*, collected at Occoquan Falls, and liable to be found farther north; and 3. *Poterium Sanguisorba*, obtained from Odenton, Md., an introduced species which may yet be found nearer home.

III. COMPARISON OF THE FLORA OF 1830 WITH THAT OF 1880.

Washington and its vicinity has long been a field of botanical research. The year 1825 witnessed the dissolution of the "Washington Botanical Society," which had for many years cultivated the science, and the same year also saw the formation of the "Botanic Club," which continued the work, and in one respect at least excelled the former in usefulness, since it handed down to us of the present generation, a valuable record in the form of a catalogue of the plants then known to exist in this locality. This catalogue, which was fittingly entitled *Floraæ Columbianæ Prodromus*, and claimed to exhibit "a list of all the plants which have as yet been collected," though now rare and long out of print, is still to be found in a few botanical libraries. I have succeeded in securing a copy of this work, and have been deeply interested in comparing the results then reached with those which we are now able to present. A few of these comparisons are well worth reproducing. It should be premised that the *Prodromus* is arranged on the artificial system of Linnæus, so that before the plants could be placed in juxtaposition with those in modern works they required to be rearranged. This, however, was not the principal difficulty. Such extensive changes have taken place in the names of plants during the fifty years which have elapsed since that work appeared (1830), that it is only with the greatest difficulty that they can be identified. I have succeeded in identifying the greater part of them, and in thus ascertaining about to what extent the two lists are in unison. This also reveals the extent to which each overlaps the other, and thus affords a sort of rude index to the changes which our flora has undergone in half a century. There are, however, as will be seen, many qualifying considerations which greatly influence these conclusions and diminish the value of the data compared.

The whole number of distinct names (species and varieties) enumerated in the *Prodromus* is 919. Of these, 59 are mere synonyms or duplicate names for the same plant, leaving 860 distinct plants. I have succeeded in identifying 708 of these with certainty as among those now found, and these are marked in the general catalogue by the sign (†). Six others, not yet clearly identified, should probably be placed in this class. This leaves 146 enumerated in the old catalogue which have not been found in recent investigations. The importance of these 146 plants as pointing out the direction of future search, and also as indicating the disappearance of former species, justifies their enumeration

here. The names employed are the modern ones to which the old synonymy has been reduced.

- | | |
|---|--|
| (1) <i>Ranunculus multifidus</i> , Pursh. | (2) <i>Pyrus Americana</i> , DC. |
| (4) <i>Actæa alba</i> , Bigelow. | (4) <i>Heuchera villosa</i> , Michx. |
| (2) <i>Calycanthus glaucus</i> , Willd. | (2) <i>Hydrangea radiata</i> , Walt. |
| (4) <i>Magnolia acuminata</i> , L. | (4) <i>Tiarella cordifolia</i> , L. |
| (4) <i>Berberis Canadensis</i> , Pursh. | (4) <i>Sedum pulchellum</i> , Michx. |
| (4) <i>Nelumbium luteum</i> , Willd. | (4) <i>Diamorpha pusilla</i> , Nutt. |
| (4) <i>Argemone Mexicana</i> , L. | (1) <i>Hippuris vulgaris</i> , L. |
| (1) <i>Corydalis glauca</i> , Pursh. | (4) <i>Rhexia Mariana</i> , L. |
| (1) <i>Corydalis aurea</i> , Willd. | (3) <i>Aralia hispida</i> , Ventenat. |
| (1) <i>Nasturtium amphibium</i> , R. Br. | (4) <i>Aralia quinquefolia</i> , Decsn. |
| (1) <i>Arabis stricta</i> , Huds. | (1) <i>Liatris spicata</i> , Willd. |
| (1) <i>Draba arabisans</i> , Michx. | (1) <i>Liatris pycnostachya</i> , Michx. |
| (4) <i>Draba Caroliniana</i> , Walt. | (1) <i>Aster divaricatus</i> , Nutt. |
| (2) <i>Gynandropsis pentaphylla</i> ,
DC. | (1) <i>Diplopappus amygdalinus</i> , T. &
G. |
| (3) <i>Lechea major</i> , Michx. | (1) <i>Solidago virgata</i> , Michx. |
| (4) <i>Viola blanda</i> , Willd. | (1) <i>Pterocaulon pycnostachyum</i> ,
Ell. |
| (3) <i>Polygala lutea</i> , L. | (4) <i>Helianthus tomentosus</i> , Michx. |
| (1) <i>Polygala setacea</i> , Michx. | (1) <i>Helianthus tracheliiifolius</i> ,
Willd. |
| (4) <i>Polygala cruciata</i> , L. | (4) <i>Coreopsis rosea</i> , Nutt. |
| (4) <i>Polygala verticillata</i> , L. | (4) <i>Senecio vulgaris</i> , L. |
| (3) <i>Polygala paucifolia</i> , Willd. | (1) <i>Cnicus pumilus</i> , Torr. |
| (4) <i>Silene inflata</i> , Sm.* | (4) <i>Carduus defloratus</i> , L. (<i>C. pecti-</i>
<i>natus</i> , L. mant.). |
| (4) <i>Silene Virginica</i> , L. | (1) <i>Lobelia Kalmii</i> , L. |
| (1) <i>Silene regia</i> , Sims. | (4) <i>Lobelia Nuttallii</i> , Roem. &
Schult. |
| (4) <i>Spergula arvensis</i> , L. | (4) <i>Campanula aparinoides</i> , Pursh. |
| (4) <i>Scleranthus annuus</i> , L. | (3) <i>Arctostaphylos Uva-ursi</i> ,
Spreng. |
| (1) <i>Hypericum galioides</i> , Lam. | (1) <i>Andromeda polifolia</i> , L. |
| (1) <i>Hypericum myrtifolium</i> , Lam. | (3) <i>Cassandra calyculata</i> , Don. |
| (2) <i>Hypericum aureum</i> , Barton: | (1) <i>Kalmia glauca</i> , Ait. |
| (4) <i>Geranium Robertianum</i> , L. | (4) <i>Fraxinus sambucifolia</i> , Lam. |
| (4) <i>Baptisia alba</i> , R. Br. | (4) <i>Apocynum androsæmifolium</i> ,
L. |
| (4) <i>Eschynomene hispida</i> , Willd. | (4) <i>Asclepias phytolaccoides</i> ,
Pursh. |
| (4) <i>Desmodium Canadense</i> , DC. | (4) <i>Asclepias tomentosa</i> , Ell. |
| (1) <i>Desmodium glabellum</i> , DC. | (1) <i>Gonolobus Carolinensis</i> , R. Br. |
| (1) <i>Vicia Cracca</i> , L. | (4) <i>Spigelia Marilandica</i> , L. |
| (1) <i>Vicia Americana</i> , Muhl. | |
| (4) <i>Centrosema Virginianum</i> ,
Benth. | |
| (3) <i>Gillenia stipulacea</i> , Nutt. | |
| (1) <i>Geum radiatum</i> , Michx. | |
| (1) <i>Rosa blanda</i> , Ait. | |
| (4) <i>Cratægus tomentosa</i> , L. | |

* Professor Chickering has found this on Sugar Loaf Mountain.

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| <p>(4) <i>Sabbatia gracilis</i>, Salisb.
 (4) <i>Frasera Carolinensis</i>, Walt.
 (4) <i>Heliotropium Europæum</i>, L.
 (4) <i>Heliotropium Indicum</i>, L.
 (4) <i>Lithospermum latifolium</i>, Michx.
 (4) <i>Onosmodium Carolinianum</i>, DC., var. <i>molle</i>, Gray.
 (1) <i>Ipomœa commutata</i>, Rœm. & Schult.
 (1) <i>Solanum Virginianum</i>, L.
 (2) <i>Solanum Dulcamara</i>, L.
 (1) <i>Physalis lanceolata</i>, Michx.
 (2) <i>Verbascum nigrum</i>, L.
 (4) <i>Gratiola aurea</i>, Muhl.
 (4) <i>Gerardia quercifolia</i>, Pursh.
 (4) <i>Gerardia auriculata</i>, Michx.
 (1) <i>Utricularia minor</i>, L.
 (2) <i>Martynia proboscidea</i>, Glox.
 (2) <i>Calophanes oblongifolia</i>, Don.
 (1) <i>Verbena Caroliniana</i>, Michx.
 (1) <i>Lippia nodiflora</i>, Michx.
 (4) <i>Trichostema lineare</i>, Nutt.
 (4) <i>Pycnanthemum aristatum</i>, Michx.
 (4) <i>Monarda didyma</i>, L.
 (4) <i>Scutellaria parvula</i>, Michx.
 (4) <i>Scutellaria galericulata</i>, L.
 (4) <i>Physostegia Virginiana</i>, Benth., var. <i>denticulata</i>, Gray.
 (4) <i>Asarum Virginicum</i>, L.
 (4) <i>Blitum capitatum</i>, L.
 (4) <i>Salicornia herbacea</i>, L.
 (4) <i>Polygonum tenue</i>, Michx.
 (4) <i>Persea Carolinensis</i>, Nees.
 (4) <i>Euphorbia obtusata</i>, Pursh.
 (4) <i>Acalypha Caroliniana</i>, Walt.
 (4) <i>Celtis occidentalis</i>, L., var. <i>crassifolia</i>, Gray.
 (1) <i>Urtica capitata</i>, Willd.
 (3) <i>Corylus rostrata</i>, Ait.</p> | <p>(3) <i>Betula lenta</i>, L.
 (2) <i>Betula alba</i>, var. <i>populifolia</i>, Sp.
 (4) <i>Populus tremuloides</i>, Michx.
 (4) <i>Populus heterophylla</i>, L.
 (4) <i>Calla palustris</i>, L.
 (4) <i>Potamogeton fluitans</i>, Roth.
 (4) <i>Sagittaria lancifolia</i>, L.
 (1) <i>Habenaria fimbriata</i>, R. Br.
 (4) <i>Arethusa bulbosa</i>, L.
 (4) <i>Pogonia pendula</i>, Lindl.
 (4) <i>Pogonia divaricata</i>, R. Br.
 (4) <i>Cypripedium spectabile</i>, Swartz.
 (4) <i>Iris Virginica</i>, L.
 (1) <i>Polygonatum latifolium</i>, Desf.
 (4) <i>Allium striatum</i>, Jacq.
 (4) <i>Lilium Philadelphicum</i>, L.
 (4) <i>Trillium cernuum</i>, L.
 (4) <i>Xyris Caroliniana</i>, Walt.
 (4) <i>Pepalanthus flavidus</i>, Kunth.
 (1) <i>Cyperus flavescens</i>, L.
 (4) <i>Cyperus flavicomus</i>, Michx.
 (4) <i>Cyperus rotundus</i>, L., var. <i>Hydra</i>, Gray.
 (1) <i>Carex flava</i>, L.
 (1) <i>Carex polymorpha</i>, Muhl.
 (1) <i>Carex subulata</i>, Michx.
 (1) <i>Carex saxatilis</i>, L.
 (3) <i>Spartina stricta</i>, Roth., var. <i>glabra</i>, Gray.
 (4) <i>Arundinaria macrosperma</i>, Michx.
 (2) <i>Phalaris arundinacea</i>, L.
 (4) <i>Paspalum distichum</i>, L.
 (1) <i>Cenchrus echinatus</i>, L.
 (2) <i>Thuya occidentalis</i>, L.
 (4) <i>Cupressus thyoides</i>, L.
 (4) <i>Lycopodium clavatum</i>, L.
 (4) <i>Chara vulgaris</i>.</p> |
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The other six which have not been satisfactorily identified are printed as follows in the *Prodromus* :

Gnaphalium Americanum.
Rochelia Virginiana.
Potamogeton diversifolium.

Polygonatum latifolium.
Mariscus cylindricus.
Panicum discolor.

The botanist familiar with this flora will be able to form a judgment more or less correct as to what the plants probably were to which these last names were assigned.

With regard to the 146 species above enumerated, it must not be hastily concluded that they represent the disappearance from our flora of that number of plants. While they doubtless indicate such a movement to a certain extent, there are ample evidences that many of them can be accounted for in other ways. After careful consideration I have been able to divide them into four principal classes as arising out of—

1st. Errors on the part of those early botanists in assigning to them the wrong names.

2d. The introduction into the catalogue of adventitious and even of mere cultivated species never belonging to the flora of the place.

3d. The undue extension by those collectors of the range of the local flora, so as to make it embrace a portion of the maritime vegetation of the Lower Potomac or the Chesapeake Bay, and also the mountain flora of the Blue Ridge.

4th. The actual extermination and disappearance of indigenous plants during the fifty years that have intervened since they made their researches.

The figure placed in parenthesis before each name in the list denotes the class in the order above indicated to which I would assign each one of these species. This assignment is of course in great part conjectural, and may be incorrect in many cases, while another botanist might have differed considerably in regard to special plants; yet it is not based upon a general judgment drawn from my acquaintance with the present flora, but upon several kinds of special evidence, which in numerous instances has reversed my *prima facie* decision. In the first place I have carefully compared the range of each species as given in the text-books to determine the probabilities for or against its being found here, and in the second place I have prepared a corresponding list of plants now found but not enumerated in the *Prodromus* and compared the two lists. I have also endeavored to make due allowance on the one hand for the tendency above referred to, to swell the catalogue as fully as possible, and on the other, for the well known fact that every flora is at all times undergoing changes. It must not be forgotten either that half a century ago the surface of the entire country here must have presented a very different appearance from that which it presents now. The population of the District of Columbia in 1830, when it included a portion of Vir-

ginia, was only 39,834. It is now, exclusive of the Virginia portion receded to that State, 177,638. To render the comparison more exact, we may add to this latter number the present population of Alexandria County, amounting to 17,545, and we have, in place of 39,834, a population on substantially the same area of 195,183, or about five times as large. The population of Maryland in 1830 was 447,040, in 1880 it was 934,632, or considerably more than twice as large; that of Virginia in 1830 was 1,211,405; Virginia and West Virginia, embracing the same territory, now number 2,131,249, the population having not quite doubled; the retardation, however, as compared with Maryland, is doubtless due entirely to influences affecting the southern counties.

There were doubtless large areas of primeval forest then within our limits which are now under cultivation, and a much greater variety of soil and woodland was then open to the researches of the botanist. As a consequence, we ought to expect that it would sustain a much richer flora.

The general results at which I arrive by the process adopted may be summed up as follows:

1st. That 43 of these names, or 29 per cent. of them, belong to the first class and constitute errors in naming.

2d. That 12 of these plants, or 8 per cent., belong to the second class or were simply cultivated species and never belonged to this flora.

3d. That 10 of them, or 7 per cent., belong to the third class and were collected beyond the reasonable limits of our local flora.

4th. That the remaining 81, or 56 per cent., belong to the fourth class, and represent *bona fide* discoveries of species which either do not now occur or are so rare as to have escaped the investigations of the present generation of botanists.

With regard to the first of these classes, the large number of errors in naming cannot be considered any derogation from the ability or fidelity of the compilers of the *Prodromus* or their immediate predecessors, when we remember the very unsettled state that American botany was in at that time. Both names and authorities were badly confused and errors were committed even by the most experienced botanists. In many of the cases the real plant which it was their intention to designate can be readily told, especially after a comparison with their omissions in the same genus. For example, their *Corydalis glauca*,* as probably also their

* This may have represented *Dicentra Cucullaria* not otherwise designated in the *Prodromus*.

C. aurea, meant *C. flavula*, which is now abundant, but omitted by them. Their *Arabis stricta* might have been *A. hirsuta* or *A. patens*, which are now rare, though it was more probably a form of *A. laevigata*, as they seemed to be 'especially fond of drawing nice distinctions and expressing them by synonyms. Varieties, however, were scarcely recognized by them, the trinomial theory being then in its infancy. I might thus proceed to discuss all their supposed errors, but the reader can do this for himself, as the species now known, but which are not contained in the *Prodromus*, are designated in the general catalogue below.

The second and third classes, amounting together to 16 per cent. of the alleged excess over the present flora, consist also of errors, but errors which it is much less easy to palliate. It is natural to wish to make as large a showing as possible, and the temptation to insert into a catalogue everything which by any construction can be claimed to belong there is rarely resisted. To show that this propensity still exists, it may be remarked that of the 1,054 species enumerated in the preliminary catalogue of the plants of this vicinity, published by the *Potomac-Side Naturalists' Club* in 1876, 89, or about 8½ per cent., are now admitted by all not to have been seen here at that time, and have never been found by any one since, although nearly three hundred other species have since been added to the flora. This is certainly not a scientific method to proceed upon, and, as already remarked, the present attempt aims to eliminate to a great extent this source of error.

The 81 species constituting the fourth class remain, therefore, the only ones to which any special interest attaches, and for the determination of which the present somewhat laborious analysis of this ancient document has been undertaken. For these the botanists of our time should make diligent search, and perchance a few of them may still be found. Assuming that they no longer exist, they do not simply represent the number of plants that have disappeared from our flora during an interval of fifty years. This could be only on the assumption that the *Prodromus* was a complete record of the flora at the time. This it certainly is not. The aggregate number, exclusive of synonyms or duplicated names, which it contained was, as we saw, 860. We now identify, counting as was then done, species and varieties, 1,249 distinct forms. While, no doubt, many of these have been freshly appearing, while others have been disappearing, still, from the considerations above set forth, it is highly probable that the indigenous flora of 1830 was considerably larger than that of 1880, and may have reached 1,400 or

1,500 vascular plants. It would appear, therefore, that only a little over half the plants actually existing were discovered by the botanists of that day and enumerated in their catalogue. If the proportion of disappearances could be assumed to be the same for species not discovered as for those discovered by them, this would raise the aggregate number to considerably above one hundred, perhaps to one hundred and twenty-five.

The great number of present known species not enumerated in the *Prodromus*, some of them among our commonest plants, and amounting in the aggregate to 535 species, is another point of interest, since, after due allowance has been made for mistakes in naming them, it remains clear on the one hand that their researches must have been, compared with recent ones, very superficial, and on the other that, not to speak of fresh introductions, many plants now common must have then been very rare, otherwise they would have proved too obtrusive to be thus overlooked.

There are many other interesting facts growing out of a comparison of these two remote dates, but space forbids their further discussion. Any one can pursue the subject who desires to do so, from the data already given and to be given, or by consulting the *Prodromus* itself.

IV. LOCALITIES OF SPECIAL INTEREST TO THE BOTANIST.

The flora of a wild region is always more uniform than that of one long subjected to human influences. The diversity in the former is a natural consequence of the corresponding diversity in the surface and other physical features. In the latter it is due to conditions arbitrarily imposed by man. A primeval flora is usually more rich in indigenous species, but the artificial changes caused by cultivation often offset this to a great extent by the introduction of foreign ones. This, however, greatly reduces its botanical interest.

In many respects the botanist looks at the world from a point of view precisely the reverse of that of other people. Rich fields of corn are to him waste lands; cities are his abhorrence, and great open areas under high cultivation he calls "poor country"; while on the other hand the impenetrable forest delights his gaze, the rocky cliff charms him, thin-soiled barrens, boggy fens, and unreclaimable swamps and morasses are for him the finest land in a State. He takes no delight in the "march of civilization," the ax and the plow are to him symbols of barbarism, and the reclaiming of waste lands and opening up of his favorite haunts

to cultivation he instinctively denounces as acts of vandalism. In him, more than in any other class of mankind, the poet's injunction,

"Woodman, spare that tree,"

touches a responsive chord. While all this may seem as absurd to some as does the withholding from tillage of great pleasure-grounds in the form of hunting-parks for the landed sporting gentry of Northern and Western Europe, still, when these parts of the world are compared with the artificially made deserts of Southeastern Europe and Western Asia, caused by the absence of such sentiments, there may perhaps be dimly recognized a "soul of good in things evil," if not a soul of wisdom in things ridiculous.

After the protracted subjection of a country to the conditions of civilization it gradually comes about that while the greater part of the surface falls under cultivation, more or less thorough, and the botanist is ultimately excluded from it, there will remain a few favored spots which from one cause or another will escape and continue to form his favorite haunts. In the vicinity of large rivers, giving greater variety to the surface, or of rugged hills or mountains, this will be especially the case. As a country grows old, large estates in the vicinity of cities fall into the possession of heirs who are engaged in mercantile or professional business and neglect them, or they come into litigation, lasting for years, and are thus happily abandoned to Nature. These and other causes have operated in an especial manner in the surroundings of Washington, and there thus exist a large number of these green oases, as it were, interspersed over the otherwise botanical desert.

In consequence of this fact it requires experience in order to improve the facilities which the place affords. A botanist unacquainted with the proper localities for successful collection might spend a month almost in vain and depart with the conviction that there was nothing here to be found. It may not be wholly peculiar, but these favored localities are here often of very limited extent and in situations which from a distance afford no attraction to the collector. Civilization is, however, very perceptibly encroaching upon many of them, and it is feared that in another half century little will be left but a few bare rocks or inaccessible marshes.

In naming localities the principal authorities relied upon are: 1, a recent *Atlas of fifteen miles around Washington, including the County of Montgomery, Md., Compiled, Drawn, and Published from Actual Surveys, by G. M. Hopkins, C. E.* Philadelphia, 1879; and 2, a military map

of N. E. Virginia, published in the work of General J. G. Barnard on the *Defenses of Washington*, 1871.

From the former the names of many roads, streams, estates, &c., have been obtained, while from the latter those of forts, batteries, &c., are often employed as more convenient. In this respect, however, much remains to be desired. While the military map is much antiquated, the other is frequently both defective in omitting what is required, and incorrect in erroneously locating streams and other objects well known to the writer. In his extensive rambles he has learned many local names not found on the maps, and in a few cases of special botanical interest where names are wholly wanting he has long been in the habit of designating the localities by names of his own christening, and for which he offers no apology.

The following are a few of the principal places of botanical interest which will be found to recur most frequently in the notes, and for this reason brief descriptions of them are appended.

1. *The Rock Creek Region.*

Rock Creek, which forms the boundary line between Washington and Georgetown (West Washington), has escaped to a remarkable degree the inroads of agriculture and population. For the greater part of its length within the District of Columbia, its banks are still finely wooded for some distance back and afford a rich and varied field for botanical exploration. The character of the surface along Rock Creek is most beautiful and picturesque, often rocky and hilly, with frequent deep ravines coming down into the usually narrow bottom through which it flows. The stream itself is full of the most charming curves, and the whole region is an ideal park. No one can see it without thinking how admirably it is adapted for a National Park. Such a park might be made to extend from Oak Hill Cemetery to the Military Road opposite Brightwood, having a width of a mile or a mile and a half. Not only every botanist, but every lover of art and nature must sigh at the prospect, now not far distant, of beholding this region devastated by the ax and the plow. The citizens of Washington should speedily unite and strenuously urge upon Congress the importance of early rescuing this ready-made National Park from such an unfortunate fate.*

* It is remarkable that when committees of Congress have been appointed, as they several times have been, to consider a site for a National Park, they have usually looked in other directions and seemed to ignore the existence of this region, which is certainly the only one that possesses any natural claims. A mere carriage-ride through

The Rock Creek region is divided, as far as the designation of localities is concerned, into six sections. The first, embracing the series of groves from Georgetown to Woodley Park, on the right bank of the creek, is called Woodley. This section embraces several interesting ravines, and in it are found many plants rare elsewhere, such as *Chamaelirium Carolinianum*, *Cypripedium pubescens*, *Hesperis matronalis*, and *Liparis Læselii*. In it is also a grove of the Hercules' Club (*Aralia spinosa*). On the left bank of the creek lie the Kalorama Heights and some fine open woodland. The Woodley Park section extends to the ravine which comes down opposite the old brick mill ruin, known as the Adams Mill. The timber here has been thinned out recently by the proprietors, but not cleared off, and the vegetation has undergone a marked change. Several interesting plants have been found in Woodley Park, including the rare *Obolaria Virginica* and the beautiful *Spiraea Aruncus*. Above this the timber is heaviest on the left bank, and some very fine ravines occur, at the head of one of which is a magnolia and sphagnum swamp where *Veratrum viride* and *Symplocarpus foetidus* keep company with *Gonolobus obliquus* and *Pirus arbutifolia*. Here, too, though well up towards the Ford, has been found *Polemonium reptans*, not seen elsewhere.

This third section terminates at Piney Branch, and from here to Pierce's mill, and as far above as the mouth of Broad Branch, the fourth section extends. This section is well wooded on both sides, and includes the enchanting Cascade Run, which leaps down over the most romantic rocks.

Near Pierce's mill are many trees and shrubs, planted there years before, but now well naturalized. Among these are *Aralia spinosa*, *Xanthoxylum Americanum*, *Acer saccharinum*, *Pinus Strobus*, and *Carya alba*. Below the mill, on the creek bottom, is a long-abandoned nursery of *Populus alba* and *Acer dasycarpum*.

From Broad Branch to the Military Road is the fifth and perhaps most interesting section of the Rock Creek Region. On the left bank lie the once noted Crystal Springs, and though the buildings are removed, the springs remain unchanged. Here have been found *Ophioglossum vulgatum*, *Anychia dichotoma*, and *Perilla ocimoides*, as well as *Tipularia discolor*. On the right bank, and above Blagden's Mill, is a bold bluff in a short bend of the creek, forming a sort of promontory, upon which

such parts as are traversed by roads is wholly insufficient to afford an adequate idea of its merits from this point of view. For the greater part of the distance mentioned above, this region is accessible only to footmen.

there grows *Gaultheria procumbens*, the wintergreen or checkerberry, this being its only known locality within our limits. Half a mile further up, and back upon the wooded slope, is the spot on which stand a dozen or more fine trees of the Table Mountain pine (*P. pungens*). Here also was first found *Pycnanthemum Torreyi*.

To these there must be added a sixth section, extending from the Brightwood Road to the north corner of the District of Columbia, which lies near Rock Creek. For the first mile there is little of interest, the cultivated land approaching the creek, and the low hills near its banks being covered with a short second growth of scrub pine and blackjack. But above the Claggett estate, on the right bank, and to some extent on both sides, lies the largest forest within our limits. This wood belongs, I learn, to the Carroll estate, and is so designated in this catalogue. In it have been found very many most interesting plants. It was the first extensive tract found for the crowfoot (*Lycopodium complanatum*), and still constitutes the most reliable and abundant source known of this plant. Its present fame, however, rests upon its hybrid oaks, of which some most interesting forms have been found there. (See *Field and Forest*, October and November, 1875, p. 39. *Botanical Gazette*, October, 1880, p. 123.) Here also grow quite abundantly *Pyrola elliptica* and *P. secunda*, and very sparingly *Microstylis ophioglossoides*. It is also a rich locality for many other species rare elsewhere.

2. The Upper Potomac Region.

The flora of the left bank of the Potomac is in many respects very unlike that of any other locality within our limits. A mile above Georgetown, and commencing from the recently constructed Outlet Lock of the Chesapeake and Ohio Canal, there exists a broad and low strip of country, formerly known by the name of Carberry Meadows, lying between the canal and the river, and extending to the feeder of the canal, a distance of about three and a half miles. This interval is relieved by two convenient landmarks, viz., one mile above the Outlet Lock, a grist-mill and guano factory, popularly known as Eads' Mill, and a mile further the celebrated Chain Bridge. Little Falls proper begin a hundred yards above the bridge and extend half a mile or more. The region above the bridge will therefore be designated as Little Falls. The flats terminate in a remarkable knoll or small hillock of very regular outline and abrupt sides, which, from the combined effect of the feeder on one side and large overflows from it below, becomes

practically an island, and is well known to all as High Island. These river flats are in most places covered with large bowlders of the characteristic gneiss rock of the country. In some parts the surface is very rough, and numerous pools or small ponds of water occur. Overflows and leakages from the canal cause large sloughs and quagmires, while annual ice-gorges crush down the aspiring fruticose vegetation. All these circumstances lend variety to the locality, and, as might be expected, the flora partakes largely of this characteristic. It would prolong this sketch unduly to enumerate all the rare and interesting plants which this region has contributed to our vegetable treasures, but conspicuous among them are *Polygonum amphibium*, var. *terrestre*, *Isanthus caruleus*, *Herpestis nigrescens*, *Brasenia peltata*, *Cyperus virens*, and *Nesaea verticillata*, all of which occur below Eads' Mill; *Ammannia humilis*, a remarkable variety of *Salix nigra* (*S. nigra*, var. *Wardi.*, Bebb. q. v. *infra*), *Salix cordata*, and *S. longifolia*, as also *Spiranthes latifolia* and *Samolus Valerandi*, var. *Americanus*, which may be found between this point and the bridge; while at the Little Falls we are favored with *Paronychia dichotoma*, *Oenothera fruticosa*, var. *linearis* (very distinct from the type), and *Ceanothus ovatus*, also *Ranunculus pusillus* and *Utricularia gibba*. But rich and varied as are these lower flats, they are excelled by High Island, the flora of which is by far the most exuberant of all within the knowledge of botanists. Here we find *Jeffersonia diphylla*, *Caulophyllum thalictroides*, *Erigenia bulbosa*, *Silene nivea*, *Valeriana paniciflora*, *Erythronium albidum*, *Iris cristata*, and great numbers of others of our most highly-prized plants, many of which are found here only.

Above the feeder is a series of islands in the river, lying for the most part near the Maryland shore, and to which the maps, so far as I can learn, assign no names. The first of these lies well out in the river, and has been made to form a part of the feeder-dam. It is low and frequently overflowed, and has not as yet furnished many rare plants, though here *Arabis dentata* and some others have been found. It has been designated Feeder-dam Island. The second is half or three quarters of a mile above, lies higher, and is covered with a very dense and luxuriant herbaceous vegetation and fine trees, chiefly of box-elder (*Negundo aceroides*), from which circumstance and the peculiar impression which the long, gracefully-pendant, staminate flowers of these trees produced on the occasion of its first discovery by a botanical party, it received the name of Box-Elder Island. The third island is a short

distance above the last, has a more elevated central portion, and a similar vegetation. Here was found on our first visit, and also on subsequent ones, *Delphinium tricorne*, and for this contribution to the Flora Columbianiana it was christened Larkspur Island. The fourth of these islands is in many respects similar to the two last described, and upon it stands the only indigenous specimen of *Acer saccharinum* (q. v. *infra*) yet found here. It has therefore been appropriately named Sugar-Maple Island. *Erythronium albidum*, *Trillium sessile*, *Jeffersonia diphylla*, and similar species abound on all these islands, while on the Larkspur Island, besides the *Delphinium*, has also been found *Phacelia Purshii*. The beauty of these natural flower-gardens in the months of April and May is unequaled in my experience. The light and rich alluvial soil causes the vegetation to shoot up with magic rapidity at the first genial rays of the vernal sun, and often the Harbinger of Spring (*Erigenia bulbosa*), true to its name, will greet the delighted Rambler in late February or early March.

The opposite or Virginia side of the Upper Potomac consists entirely of bold bluffs, interrupted by deep ravines, often containing wild torrents and dashing cascades. Here the flora, though less rich and varied, is also characteristic and interesting, and embraces among other rare things *Rhododendron maximum*, *Iris cristata*, *Scutellaria saxatilis*, *Pycnanthemum Torreyi*, *Solidago rupestris*, and *S. Virga-aurea*, var. *humilis*.

On the Maryland side, and a mile above the uppermost point thus far mentioned is the Cabin John Run, which the botanist celebrates more for its Walking Fern (*Camptosorus rhizophyllus*) than for the world-renowned arch that spans it.

The next most prolific source of interesting plants is the region of the Great Falls. The collecting grounds begin a mile or more below, at Broad Water. On both sides of the canal the country is excellent, rocky and wooded, with stagnant pools and sandy hillocks. On these rocks grows *Sedum telephoides*, and near Sandy Landing are found *Vitis vulpina* (q. v.), *Arabis patens*, *A. hirsuta*, and *Triosteum angustifolium*. In the pools have been found *Carex decomposita*, *Potamogeton hybridus*, and *P. paniciflorus*, while on a rocky headland a large "water-pocket" has yielded us our only specimen of the white water-lily (*Nymphaea odorata*). *Crataegus parvifolia*, *Rumex verticillatus*, *Steironema lanceolatum*, and last, but not least, *Nasturtium lacustre*, have also rewarded my researches in this singular and rather weird region.

On the opposite side of the river the site of the ancient canal around the falls has proved very fertile in botanical trophies. *Polygala ambigua* is found near the boat-landing, while by climbing the cliffs below this point the native of more northern climes may gaze once more upon his familiar hemlock spruce (*Tsuga Canadensis*). Difficult Run, a mile farther down, though indeed difficult of approach, repays the effort with *Podostemon ceratophyllus*, *Smilacina stellata*, *Potamogeton Claytonii*, and numerous other herbal treasures.

3. The Lower Potomac Region.

Passing next to the Lower Potomac, the localities of special interest are : 1. Custis Spring, opposite the Arlington estate, with the extensive marsh below, where *Sagittaria pusilla*, *Discopleura capillacea*, *Cyperus erythrorhizos*, and other rare species are alone known to grow. 2. The point and bay below Jackson City, known as Roach's Run, where are found, among other good things, *Scrophularia nodosa*, *Tripsacum dactyloides*, and *Pyrenanthemum lanceolatum*. 3. Four Mile Run, half way to Alexandria, not yet sufficiently explored, including the vicinity of Fort Scott, to the northwest, where *Olematis ochroleuca* and *Aselepias quadrifolia* may be collected ; and, 4. Hunting Creek, a large estuary below Alexandria, including Cameron Run, the stream which debouches into it with its tributaries, Back Lick Run and Holmes Run, which unite to form it. Here have been found at various points *Olematis ochroleuca*, *Gonolobus hirsutus*, *Itea Virginica*, *Geranium columbinum*, *Mieranthemum Nuttallii*, *Habenaria virescens*, *Quercus macrocarpa*, *Carex gracillima*, *Geum strictum*, *Galium asprellum*, and very many other rare plants.

On the left bank of the Lower Potomac the chief locality of interest is a large wooded area below the Government Hospital for the Insane. This has proved a rich hunting ground for the botanist, and has yielded *Carex pulloseens*, *C. tetanica*, var. *Woodii*, *Gonolobus hirsutus*, *Silene Armeria*, *Parietaria Pennsylvanica*, *Myosotis arvensis*, *Scutellaria nerrosa*, &c. *Asplenium angustifolium* is known only at Marshall Hall, where it has been collected by Mr. O. M. Bryan, while opposite Fort Foote Mr. Zumbroek has found *Myriophyllum spicatum*, and opposite Alexandria Professor J. H. Comstock and Miss H. B. Willets have discovered *Plantago cordata*.

4. The Terra Cotta Region.

This embraces some low grounds and undulating barrens near the terra cotta works at Terra Cotta Station, on the Metropolitan Branch of the Baltimore and Ohio Railroad, three miles from the city, and also

a small swamp a quarter of a mile beyond and to the eastward. Here on the dry ground have been found *Onosmodium Virginianum*, *Clitoria Mariana*, and *Habenaria lacera*, while in the swamp occur *Aster astivus*, *Solidago stricta*, *Woodwardia Virginica*, *Asclepias rubra*, *Poterium Canadense*, and numerous other plants rare or absent in other localities.

5. The Reform School Region.

This locality is very limited in extent but has proved one of the most fertile in botanical rarities. Its nucleus consists of a little swampy spot a short distance to the south of the National Reform School, in which is located a beautiful spring; but the woody tract of country surrounding this and stretching southward and eastward some distance has also proved very fruitful. In the different portions of this region have been discovered *Phlox maculata*, *Melanthium Virginicum*, *Bartonia tenella*, *Lespedeza Stuevei*, *Desmodium Marylandicum* and *D. ciliare*, *Buchnera Americana*, *Fimbristylis capillaris*, *Quercus prinoides*, *Carex bullata*, *Habenaria ciliaris*, and *Gentiana ochroleuca*, most of which do not occur at all elsewhere.

6. The Holmead Swamp Region.

Like the last, this locality is quite circumscribed in area, but like it, too, it is rich in interesting plants. It occupies a ravine leading to Piney Branch from the east, at the point where the continuation of Fourteenth street crosses that stream. The road connecting the last named with the Rock Creek Church road, and which is called Spring Street, follows this valley. The collecting-grounds are on the south side of this road and in the springy meadow along the rill. The timber has long been cut off but the boggy character of the ground has thus far protected it from cultivation. The pasturing of animals on it during a portion of the year has latterly become a serious detriment to the growth of plants. Mr. Holmead, who owns it and lives near by, has kindly permitted botanists to investigate it for their purposes. Here have been found *Ludwigia hirsuta*, *Drosera rotundifolia*, *Asclepias rubra*, *Xyris flexuosa*, *Fuirena squarrosa*, *Rhynchospora alba*, *Coreopsis discoides*, and the beautiful *Calopogon pulchellus*, the most showy of our orchids.

In addition to these specially fertile tracts, there are many other localities of great interest where valuable accessions to our flora have been made, and which will be particularly designated under the names of these species. It will suffice here to mention a wet meadow between the National Driving Park and Bladensburg, where, in a very diminu-

tive spot *Sarracenia purpurea*, *Viola lanceolata*, and *Carex bullata*, the two first wholly unknown elsewhere, have been discovered; a marsh a mile above Bladensburg, near the mill-race, where only the majestic *Stenanthium robustum* has been seen; a little swamp near the Sligo Creek, between the Riggs and Blair roads, where the Hartford Fern (*Lygodium palmatum*) grows sparingly; and another, between Bladensburg and the Maryland Agricultural College, where *Solidago elliptica*, *Ascyrum stans*, and *Lycopodium complanatum*, var. *Sabinæfolium*, have been found. The Eastern Branch region is not specially rich in floral treasures, but on its banks and marshes some good things appear. *Steironema lanceolatum*, *Eleocharis quadrangulata*, *Scirpus fluviatilis* and *S. sylvaticus*, *Ranunculus ambigens*, and *Salix Russelliana* are among these, though some of them are also found elsewhere.

V. FLOWERING TIME OF PLANTS.

It has already been remarked that most species flower at Washington much earlier than at points farther north or than the dates given in the manuals. In consequence of this, a botanist unacquainted with this fact and accustomed to those climates, and to relying upon the books, would be likely to be behind the season throughout the year and fail to get the greater part of the plants he desired. With all my efforts to make allowance for this fact, I have frequently been sorely disappointed, and was at last driven to making a careful record, preserving and correcting it from year to year, of the flowering time of plants in this locality. The notes on this subject appended to nearly every species enumerated in the list embody the general results of these observations, and may in the main be relied upon. The expressions used are not loose conjectures, but are in the nature of compilations from recorded data. In most cases an allowance of two weeks may be made for the difference in seasons, though rarely more and often less. Certain plants, as, for example, *Tipularia discolor*, flower at almost exactly the same time every year. Occasionally, however, one will vary a month or more in a quite unaccountable way. But any one who has watched the periodical changes of the general vegetation for a series of years and recorded his observations will more and more realize the exactness even of these complex biological phenomena, which depend so absolutely upon uniform astronomical events.

From this point of view the season which presents the greatest variation, and also for this and other reasons the greatest interest, is the

spring. There are a few plants which may sometimes be found in flower here in January, such as *Stellaria media*, *Taraxacum Dens-leonis*, or *Acer dasycarpum* (collected January 17, 1876, in the city), in favored places; but these will bloom at any time when a few days of mild weather with sunshine can come to revive them. There are, however, several strictly vernal species, which bloom quite regularly in the latter part of February, such as *Symplocarpus fœtidus*, *Chrysosplenium Americanum*, and often *Anemone Hepatica*. The number regularly found in flower in March is quite large, and in special years very large. It was, of course, impossible to make observations every day of any year, but taking a number of years, my observations cover nearly every day of the spring season. As showing the number of these early vernal species, and also how widely the seasons may differ, the following facts are presented:

In the year 1878, 17 species had actually been seen in flower and noted up to March 24. I did not go out again that year until April 7, when I enumerated 46 additional species, making 63 in all up to that date. This was an exceptionally early season. The next spring—that of 1879—was a backward one, as is shown by the fact that, while I had visited the same localities and taken notes with equal care, only 33 species had been seen in flower up to April 13. Twenty-nine species which had been seen in flower on April 7, 1878, were not yet in flower in the same localities on April 13, 1879. There appeared to be about three weeks' difference in these two seasons. The last season—1880—was again an early one, though less so than 1878. It was, however, near enough to the average to render the facts observed of great value. The following are a few of them:

On February 29, seven species were seen in flower in the Rock Creek Region. On April 4, thirty were enumerated on the Virginia side of the Potomac, above the Aqueduct Bridge. On April 11, eleven were seen in addition to those previously enumerated in the Eastern Branch region; and on the 18th of April, High Island was visited and twenty-nine added to all previously recorded, three of which were then in fruit. The total to this date was, therefore, seventy species. This season I concluded was a week or ten days later than that of 1878, and as much earlier than that of 1879.*

We may now inquire what some of these early plants are.

* Since the above was written, the present season (1881) has passed its vernal period. It has proved still more backward than 1879 and the latest spring thus far observed. On April 3 I made my first excursion and visited the Virginia side of the Potomac above Rosslyn. Only 7 species were seen in flower, including *Alnus serrulata*, which doubtless can be obtained much earlier in ordinary years, but has been overlooked.

The following have been observed in flower in February:

<i>Chrysosplenium Americanum</i>	February 17, 1878
<i>Anemone Hepatica</i>	February 20, 1876
<i>Salix Babylonica</i>	February 22, 1874
<i>Populus alba</i>	February 22, 1874
<i>Draba verna</i>	February 24, 1878
<i>Acer dasycarpum</i>	February 24, 1878
<i>Stellaria media</i>	February 29, 1880
<i>Cerastium viscosum</i>	February 29, 1880
<i>Claytonia Virginica</i>	February 29, 1880
<i>Acer rubrum</i>	February 29, 1880
<i>Symplocarpus foetidus</i>	February 29, 1880

To these should, perhaps, be added, *Equisetum hyemale*, which was found February 17, 1878, near the Receiving Reservoir, with the spikes well advanced, quite contrary to the books which make it fruit in summer.

In addition to the above, which may often also be seen later, the following have been noted flowering in March:

<i>Populus alba</i>	March 3, 1874
<i>Viola pedata</i>	March 5, 1876
<i>Houstonia cærulea</i>	March 5, 1876
<i>Obolaria Virginica</i>	March 5, 1876
<i>Dentaria heterophylla</i>	March 8, 1874
<i>Poa brevifolia</i>	March 8, 1874
<i>Capsella Bursa-pastoris</i>	March 10, 1878
<i>Lamium amplexicaule</i>	March 10, 1878
<i>Lindera Benzoin</i>	March 10, 1878
<i>Epigæa repens</i>	March 15, 1874
<i>Ulmus fulva</i>	March 15, 1874
<i>Luzula campestris</i>	March 15, 1874
<i>Saxifraga Virginensis</i>	March 16, 1879
<i>Sanguinaria Canadensis</i>	March 17, 1878
<i>Sisymbrium Thaliana</i>	March 17, 1878

Besides *Draba verna*, a January species, and *Anemone Hepatica*, a February one, the only herbaceous flower found was *Sanguinaria Canadensis*. On April 10 High Island was visited, but only 8 species could be added to the above 7, and several of these, as *Jeffersonia diphylla*, *Dicentra Cucullaria*, *Saxifraga Virginensis*, *Erythronium Americanum*, and *Stellaria pubera*, were very sparingly out. Cold weather continued to the end of the third week in April, and on April 24, when High Island was again visited and a thorough canvass made, only 22 additional plants could be found there, and the whole number seen to that date was 46. The conclusion was that up to that time the season was about three weeks later than that of 1880.

<i>Salix tristis</i>	March 17, 1877
<i>Populus grandidentata</i>	March 21, 1880
<i>Corydalis flavula</i>	March 22, 1874
<i>Thalictrum anemonoides</i>	March 24, 1878
<i>Dentaria laciniata</i>	March 24, 1878
<i>Antennaria plantaginifolia</i>	March 24, 1878
<i>Erodium cicutarium</i>	March 27, 1874
<i>Erigenia bulbosa</i>	March 28, 1875
<i>Cardamine hirsuta</i>	March 30, 1879

It is about the 1st of April, especially in early years, that the vegetation seems to receive its greatest impetus. This is well shown by the following list of species seen in flower during the first week in April:

<i>Ulmus Americana</i>	April 1, 1873
<i>Jeffersonia diphylla</i>	April 2, 1876
<i>Cardamine rhomboidea</i>	April 2, 1876
<i>Stellaria pubera</i>	April 2, 1876
<i>Thaspium aureum</i>	April 2, 1876
<i>Euphorbia commutata</i>	April 2, 1876
<i>Alnus serrulata</i>	April 3, 1881
<i>Ranunculus abortivus</i>	April 4, 1880
<i>Dicentra Cucullaria</i>	April 4, 1880
<i>Arabis laevigata</i>	April 4, 1880
<i>Viola tricolor</i> , var. <i>arvensis</i>	April 4, 1880
<i>Vicia Caroliniana</i>	April 4, 1880
<i>Amelanchier Canadensis</i>	April 4, 1880
<i>Nepeta Glechoma</i>	April 4, 1880
<i>Sassafras officinale</i>	April 4, 1880
<i>Carpinus Americana</i>	April 4, 1880
<i>Ostrya Virginica</i>	April 4, 1880
<i>Erythronium Americanum</i>	April 4, 1880
<i>Barbarea vulgaris</i>	April 5, 1874
<i>Pedicularis Canadensis</i>	April 5, 1874
<i>Mertensia Virginica</i>	April 5, 1874
<i>Ranunculus abortivus</i> , var. <i>micranthus</i>	April 7, 1878
<i>Ranunculus repens</i>	April 7, 1878
<i>Asimina triloba</i>	April 7, 1878
<i>Caulophyllum thalictroides</i>	April 7, 1878
<i>Arabis dentata</i>	April 7, 1878
<i>Barbarea præcox</i>	April 7, 1874

<i>Sisymbrium Alliaria</i>	April 7, 1878
<i>Viola cucullata</i>	April 7, 1878
<i>Viola striata</i>	April 7, 1878
<i>Viola glabella</i>	April 7, 1878
<i>Ionidium concolor</i>	April 7, 1878
<i>Silene Pennsylvanica</i>	April 7, 1878
<i>Cerastium vulgatum</i>	April 7, 1878
<i>Cerastium oblongifolium</i>	April 7, 1878
<i>Geranium maculatum</i>	April 7, 1878
<i>Oxalis corniculata</i> var. <i>striata</i>	April 7, 1878
<i>Cercis Canadensis</i>	April 7, 1878
<i>Potentilla Canadensis</i>	April 7, 1878
<i>Thaspium trifoliatum</i>	April 7, 1878
<i>Cornus florida</i>	April 7, 1878
<i>Chrysogonum Virginianum</i>	April 7, 1878
<i>Senecio aureus</i>	April 7, 1878
<i>Fraxinus viridis</i>	April 7, 1878
<i>Phlox divaricata</i>	April 7, 1878
<i>Lithospermum arvense</i>	April 7, 1878
<i>Betula nigra</i>	April 7, 1878
<i>Populus monilifera</i>	April 7, 1878
<i>Arisæma triphyllum</i>	April 7, 1878
<i>Erythronium albidum</i>	April 7, 1878
<i>Trillium sessile</i>	April 7, 1878

My special observations on the vernal flowering time of plants extend about two weeks later, or to the end of the third week in April, after which the great number of plants in bloom, including the amentaceous trees, render it difficult to pursue the investigation, while at the same time the facts become less valuable. The results for the second and third weeks of April, always excluding all previously enumerated, are as follows:

<i>Arabis lyrata</i>	April 9, 1876
<i>Fraxinus pubescens</i>	April 11, 1880
<i>Salix cordata</i>	April 11, 1880
<i>Salix purpurea</i>	April 11, 1880
<i>Vaccinium corymbosum</i>	April 12, 1874
<i>Carex platyphylla</i>	April 12, 1874
<i>Poa annua</i>	April 12, 1874
<i>Thalictrum dioicum</i>	April 14, 1876

<i>Rhus aromatica</i>	April 14, 1878
<i>Phlox subulata</i>	April 14, 1878
<i>Arabis patens</i>	April 18, 1880
<i>Cardamine hirsuta</i> , var. <i>sylvatica</i>	April 18, 1880
<i>Negundo aceroides</i>	April 18, 1880
<i>Erigeron bellidifolius</i>	April 18, 1880
<i>Krigia Virginica</i>	April 18, 1880
<i>Sisyrinchium anceps</i>	April 18, 1880
<i>Carex laxiflora</i>	April 18, 1880
<i>Carex Emmonsii</i>	April 18, 1880
<i>Melica mutica</i>	April 18, 1880
<i>Anemone nemorosa</i>	April 19, 1874
<i>Viola cucullata</i> , var. <i>cordata</i>	April 19, 1874
<i>Dirca palustris</i>	April 19, 1874
<i>Carex Pennsylvanica</i>	April 19, 1874
<i>Lathyrus venosus</i>	April 21, 1878
<i>Ribes rotundifolium</i>	April 21, 1878
<i>Salix nigra</i> , var. <i>Wardi</i>	April 21, 1878

We thus see that a single collector has, in the course of eight years' operations, actually observed and noted 11 species in bloom in February, 24 more in March, 51 additional in the first week of April, and 26 others during the second and third weeks of April, or 112 up to April 21.

It should be remarked that there is no doubt that if the same localities in which the large number were observed on April 2, 1876, April 4, 1880, and April 7, 1878, had been visited in the last days of March of those years, quite a number of these plants would have been found sufficiently advanced to demand a place in the lists, and thus the month of March would have been credited with so many here set down for the first week in April. Probably, all things considered, not less than 50 species in certain favored seasons either reach or pass by their flowering time by the end of March.

In arranging the above lists the order of dates has, of course, taken precedence, but where several are enumerated under one date the natural order is followed.

It is scarcely necessary to suggest a caution to collectors against relying upon these dates in making collections. They represent the earliest observations and not the average. In most cases an allowance of at least one week should be made for the full blooming of all the individuals of any given species. In all cases, however, one or more individuals

were actually seen in flower and sufficiently advanced for collection; otherwise no note was taken. The *Carices* of course had not advanced to developed *perigynia*, and many plants whose inflorescence is centrifugal or centripetal, or which develop fruit while retaining flowers, should be looked for at a later stage.

VI. AUTUMNAL FLOWERING.

One of the most interesting peculiarities of the flora of this vicinity is that of the second blooming of vernal species, which in most cases takes place quite late in the fall (See *Field and Forest*, April-June, 1878, Vol. III, p. 172). In addition to the seven species observed and published in 1878, I have noted more than as many others manifesting this habit, and it is probable that still others will yet be added. The following is a list of those thus far recorded, with the dates at which observed, and which may be compared with those of their regular vernal period :

<i>Ranunculus abortivus</i> , var. <i>micranthus</i>	November 28, 1875
<i>Cardamine hirsuta</i>	October 3, 1880
<i>Viola pedata</i> , var. <i>bicolor</i>	Sept. 22 and Dec. 8, 1878.
<i>Viola striata</i>	September 10, 1876
<i>Fragaria Virginiana</i>	September 22, 1878
<i>Rubus villosus</i>	Sept. 22 and Oct. 27, 1878
<i>Lonicera Japonica</i>	October 13, 1878
<i>Houstonia purpurea</i>	October 13, 1878
<i>Houstonia purpurea</i> , var. <i>angustifolia</i>	September 12, 1880
<i>Houstonia cærulea</i>	September 7, 1879
<i>Vaccinium stamineum</i>	October 13, 1878
<i>Rhododendron nudiflorum</i>	October 13, 1878
<i>Phlox divaricata</i>	October 16, 1873
<i>Sabbatia angularis</i>	October 27, 1878
<i>Echium vulgare</i>	October 8, 1880
<i>Veronica officinalis</i>	October 8, 1873
<i>Agrostis scabra</i>	November 12, 1876

To this list of seventeen should perhaps be added *Stellaria pubera*, which, instead of a vernal and an autumnal period, has two vernal periods, as described under that species in the systematic notes. *Salix longifolia* has this year flowered twice, once in April and again in June.*

* Mr. M. S. Bebb, under date of June 22, 1881, replying to my inquiry in regard to this phenomenon, says: "The second blooming of *S. longifolia* is not anomalous; but,

Autumnal blooming, in so far as it is peculiar to this climate, may be chiefly attributed to the tolerably regular occurrence here of a hot and dry season in midsummer. This usually begins towards the end of June and ends about the middle of August. During this period in some seasons the ground and vegetation become parched and dried up so that vegetal processes in many plants cease almost as completely as in the opposite season of cold. From this dormant state the warm and often copious rains of the latter part of August revive them as do the showers of spring, and they begin anew their regular course of changes. The frosts of October usually cut their career short before maturity is reached, but in some cases two crops of seed are produced. In addition to this, there frequently also occurs a very warm term in November, often extending far into December, and of this certain species take advantage and push forth their buds and flowers.

VII. ALBINOS.

Well-defined albinos have been collected of the following species:

Desmodium nudiflorum.	Mertensia Virginica.
Liatris graminifolia.	Sabbatia angularis.
Rhododendron nudiflorum.	Pontederia cordata.
Vinca minor.	

The green-flowered variety of *Trillium sessile* and of *Gonolobus obliquus* are also found. On June 16 of this year I collected *Carex tentaculata* on the Eastern Branch marsh, having the spikes completely white, as if etiolated, but not yet mature, and apparently perfectly healthy and vigorous; indeed the plants were considerably taller than normally green ones growing with them, but they were always either entirely whitened or not at all so. On examination and comparison no other differences could be detected.

VIII. DOUBLE FLOWERS, ETC.

Thalictrum anemonoides, *Ranunculus bulbosus*, *Claytonia Virginica*, and *Rubus Canadensis* have been found with the flowers much doubled, as in cultivation.

Hydrangea arborescens occasionally has the outer circle of petals expanded, as in cultivation.

Rudbeckia fulgida has been found with all its rays tubular but of the usual length.

on the contrary, this species continues to bloom from May to September, wherever found, from New England to Calif, and yet the fact has not received mention in the books." He further states, however, that he has called attention to it some years ago in the "Lens." [Since appending this note I have revisited the locality (July 17, 1881,) and find it still blooming with fresh flowers.]

IX. STATISTICAL VIEW OF THE FLORA.

In order to present a clear view of the general character of the vegetation of the District of Columbia and the adjacent country, I have made a somewhat careful analysis of the larger groups and families, and comparison of them not only with each other but with the same groups and families in larger areas and other local floras. The general results are presented below.

It is important to remark that in all enumerations it is not simply the number of *species* as at present recognized, but the number of *different plants* (species and varieties) that is employed. The reason for doing this is, that in very many cases well-marked varieties are eventually made species, and if two plants really differ there is little probability that they will ever be merged into one species without that difference being indicated by some difference of name. The aim has therefore been to take account of the number of plants without regard to the manner in which they are named.

The whole number of vascular plants now known to this flora, as catalogued in the list appended to this paper, is 1,249, and these belong to 527 different genera, or about $2\frac{1}{3}$ species to each genus. These are distributed among the several systematic groups as follows:

Series, Classes, and Divisions.	Genera.	Species and varieties.
Polypetalæ	174	356
Gamopetalæ	169	389
Total Dichlamydeæ	343	745
Monochlamydeæ (Apetalæ)	47	124
Total Dicotyledons	390	869
Monocotyledons	112	331
Gymnospermæ (Coniferae)	4	7
Total Phanogamia	506	1,207
Cryptogamia	21	42
Total Vascular Plants	527	1,249
The percentages of the total are as follows:		
Polypetalæ	33	29
Gamopetalæ	32	31
Total Dichlamydeæ	65	60
Monochlamydeæ (Apetalæ)	9	10
Total Dicotyledons	74	70
Monocotyledons	21	26
Gymnospermæ (Coniferae)	1	1
Total Phanogamia	96	97
Cryptogamia	4	3

Large orders.

The 16 largest orders, arranged according to the number of species, are as follows:

Rank.	Orders.	Genera.	Species and varieties.
1	Compositæ	53	149
2	Gramineæ	43	110
3	Cyperacæ	10	108
4	Leguminosæ	24	57
5	Rosacæ	15	46
6	Labiatæ	23	42
7	Cruciferae	16	33
8	Scrophulariaceæ	15	32
9	Filices	16	30
10	Ranunculacæ	7	27
11	Ericacæ	11	26
12	Cupuliferae	7	26
13	Orchidacæ	12	24
14	Liliacæ	18	24
15	Polygonacæ	3	23
16	Umbelliferae	17	22

The whole number of systematic orders represented in our district is 116, of which these 16 or 14 per cent. furnish 55 per cent. of the genera and 62 per cent. of the species.

Large genera.

The 15 largest genera, arranged according to the number of plants, are the following:

Rank.	Genera.	Species and varieties.
1	Carex	70
2	Aster	21
3	Panicum	19
4	Solidago	18
5	Quercus	18
6	Polygonum	16
7	Desmodium	14
8	Salix	14
9	Juncus	14
10	Viola	13
11	Cyperus	12
12	Ranunculus	11
13	Eupatorium	11
14	Helianthus	10
15	Asclepias	10

Thus 15, or less than 3 per cent. of the genera, furnish 271, or nearly 22 per cent. of the species.

Introduced Species.

The whole number of introduced plants enumerated in the subjoined catalogue is 193, of which 15 are supposed or known to be indigenous

to other parts of the United States.* These are distributed through the several larger groups as follows :

Groups.	Old World.	United States.	Total.
Polypetalous	65	8	73
Gamopetalous	54	3	57
Apetalous (Monochlamydeous)	28	2	30
Monocotyledonous (Endogenous)	31	1	32
Gymnospermous (Coniferous)		1	1
Total	178	15	193

It will be seen that the introduced plants amount to 15.5 per cent. of the total flora. The several orders to which these belong are shown in the Summary.

Shrubby Species.

Of the 342 "forest trees" enumerated in Sargent's preliminary catalogue of 1880, this flora embraces 85, or 24.8 per cent., of which 65 are large enough to have the dignity of timber trees. Of these 85, 25 are in the Polypetalous Division, but only 12 of this latter number are large; 9 are in the Monopetalous Division, all but 2 of which are large; 44 are in the Apetalous Division, 39 of which are large; and the remaining 7 are Coniferous, all full-sized trees.

The whole number of species which are shrubby or woody above ground is 194, which is 15.5 per cent. of the whole. They are distributed as follows :

Polypetalous	83
Gamopetalous	36
Apetalous (Monochlamydeous)	64
Monocotyledonous (Endogenous)	4
Gymnospermous (Coniferous)	7
Total	194

For further particulars the reader can consult the Summary at the end of the catalogue.

Comparisons with other Floras.

While these facts are of great interest in affording a clear conception of the character of our flora, they do not aid us in determining in what respects it is peculiar or marks a departure from those of other portions

* These are the following :

Xanthoxylum Americanum.	Ribes rotundifolium.	Catalpa bignonioides.
Trifolium repens.	Ribes rubrum.	Maclura aurantiaca.
Prunus Chicasa.	Passiflora incarnata.	Populus grandidentata.
Rosa setigera.	Symphoricarpus racemosus.	Poa annua.
Philadelphus inodorus.	Symphoricarpus vulgaris.	Pinus Strobus.

of the country, or from that of the country at large. To institute comparisons with other local floras would, of course, carry me much too far for the general purpose of this paper, but it is both more interesting and more practicable to confront a few of the above results with similar ones drawn from a consideration of a large part of the United States. For this purpose, as not only most convenient but as least liable to embrace facts calculated to vitiate the comparisons, I have chosen that portion of the United States situated east of the Mississippi River and for the most part well covered by *Gray's Manual of Botany* for the northern portion and *Chapman's Flora of the Southern States* for the southern portion. The plants described in these works are conveniently collected into one series by the second edition of *Mann's Catalogue*, published under the supervision of the authorities at Cambridge in 1872. Many changes have since been made in the names, &c., and a few new species added, but these are not sufficient to affect the general conclusions to be drawn from the following comparative tables.

Comparison of Species and Varieties.

The number of species and varieties of vascular plants enumerated in the work above referred to is 4,034, of which the 1,249 of the flora of Washington constitute 31 per cent. The comparison by groups is as follows:

Series, Classes, and Divisions.	Species and varieties in the—		
	Eastern United States.	Flora Colum- biana.	Per cent.
Polypetalæ.....	1, 115	356	32
Gamopetalæ.....	1, 314	389	30
Total Dichlamydeæ.....	2, 429	745	31
Monochlamydeæ (Ápetalæ).....	349	124	36
Total Dicotyledons.....	2, 778	869	31
Monocotyledons (Endogens).....	1, 034	331	32
Gymnospermæ.....	28	7	25
Total Phanogamia.....	3, 840	1, 207	31
Cryptogamia.....	194	42	22
Total Vascular Plants.....	4, 034	1, 249	31

Comparison of Genera.

The whole number of genera in the flora of the Eastern United States is 1,065. That of the Flora Columbiana, as already stated, is 527. This is over 49 per cent., a much larger proportion than was shown by a com-

parison of the species. A comparison of the genera by groups gives the following results:

Series, Classes, and Divisions.	Genera represented in the—		Per cent.
	Eastern United States.	Flora Columbi-ana.	
Polypetalæ.....	340	174	51
Gamopetalæ.....	379	169	45
Total Dichlamydeæ.....	719	343	48
Monochlamydeæ (Apetalæ).....	97	47	48
Total Dicotyledons.....	816	390	48
Monocotyledons.....	198	112	57
Gymnospermæ.....	12	4	33
Total Phænogamia.....	1,026	506	49
Cryptogamia.....	39	21	54
Total Vascular Plants.....	1,065	527	49

The percentages here range from 33 in the Gymnosperms to 57 in the Monocotyledons, averaging between 49 and 50, whereas in the similar comparisons for species they ranged from 22 in the Cryptogams to 36 in the *Monochlamydeæ*. This result was to be expected, since as the groups increase the number represented in any local flora should be proportionately larger. For example, 116 orders out of the 156 are represented here, which is upwards of 74 per cent.

Comparison of Large Orders.

It will be interesting to compare in a manner similar to the foregoing the number of species in several of the largest orders. For this purpose we may use the same orders mentioned on page 35 as the richest in species of any belonging to this flora. The comparison may then be shown as follows:

Rank.	Orders.	Eastern United States.	Flora Columbi-ana.	Per cent.
1	Compositæ.....	497	149	30
2	Graminææ.....	297	110	37
3	Cyperaceæ.....	357	108	30
4	Leguminosæ.....	208	57	27
5	Rosaceæ.....	104	46	44
6	Labiataæ.....	121	42	35
7	Cruciferaæ.....	76	33	43
8	Scrophulariaceæ.....	97	32	33
9	Filices.....	134	30	22
10	Ranunculaceæ.....	80	27	34
11	Ericaceæ.....	89	26	29
12	Cupuliferæ.....	45	26	58
13	Orchidaceæ.....	71	24	34
14	Liliaceæ.....	82	24	29
15	Polygonaceæ.....	56	23	41
16	Umbelliferaæ.....	63	22	35

This table exhibits better perhaps than any other the special characteristics of the flora. The normal percentage being about 31, we see that in all but five of these sixteen largest orders our flora is in excess of that standard, while it is richest proportionally in the *Cupuliferae*, *Rosaceae*, and *Cruciferae*, and poorest in the *Filices* and *Leguminosae*.

Comparison of large genera.

In like manner we may compare the 15 large genera given in a preceding table (p. 35):

Rank.	Genera.	Eastern United States.	Flora Columbiana.	Per cent.
1	Carex	180	70	39
2	Aster	63	21	33
3	Panicum	36	19	53
4	Solidago	61	18	30
5	Quercus	38	18	47
6	Polygonum	27	16	59
7	Desmodium	24	14	58
8	Salix	23	14	61
9	Juncus	38	14	37
10	Viola	24	13	54
11	Cyperus	41	12	29
12	Ranunculus	27	11	41
13	Eupatorium	24	11	46
14	Helianthus	27	10	37
15	Asclepias	22	10	45

This table shows that in all the large genera, except *Solidago* and *Cyperus*, the District of Columbia has more than its full proportion. The genus *Salix* is the one proportionally best represented, while *Polygonum*, *Desmodium*, *Panicum*, and *Viola* each exceed 50 per cent. *Quercus*, *Eupatorium*, and *Asclepias* are also well filled out.

As already remarked, it would carry us too far to undertake the systematic comparison of our flora with those of other special localities, even were the data at hand. Few local catalogues are condensed and summarized for this purpose, and the labor of doing this is very great. The recently published *Flora of Essex County, Massachusetts*, prepared by Mr. John Robinson, however, forms something of an exception to this, and we may directly compare the larger classes and also the orders. The following tables will give an idea of the differences between that flora and our own:

Series, Classes, and Divisions.	Number of orders.		Number of genera.		Number of species and varieties.	
	Essex County.	Flora Columbi-ana.	Essex County.	Flora Columbi-ana.	Essex County.	Flora Columbi-ana.
Polypetales	42	45	155	174	360	356
Gamopetales	25	27	158	169	358	389
Total Dichlamydeæ	67	72	313	343	718	745
Monochlamydeæ	18	19	44	47	132	124
Total Dicotyledons	85	91	357	390	850	869
Monocotyledons	17	20	120	112	392	331
Gymnospermæ (Conifera)	1	1	7	4	17	7
Total Phanogamia	103	112	484	506	1,259	1,207
Cryptogamia	5	4	20	21	65	42
Total Vascular Plants	108	116	504	527	1,324	1,249

The 16 large orders enumerated on page 35 may also be compared with profit:

Rank.	Orders.	Number of genera.		Number of species and varieties.	
		Essex County.	Flora Columbi-ana.	Essex County.	Flora Columbi-ana.
1	Compositæ	43	53	136	149
2	Gramineæ	50	43	128	110
3	Cyperaceæ	9	10	120	108
4	Leguminosæ	17	24	39	57
5	Rosaceæ	12	15	55	46
6	Labiata	22	23	35	42
7	Crucifera	14	16	29	33
8	Scrophulariaceæ	14	15	29	32
9	Filices	13	16	40	30
10	Ranunculaceæ	9	7	50	27
11	Ericaceæ	18	11	37	26
12	Cupulifera	6	7	16	26
13	Orchidaceæ	13	12	32	24
14	Liliaceæ	18	18	27	24
15	Polygonaceæ	3	3	27	23
16	Umbellifera	16	17	20	22

In the flora of Essex County the orders *Umbellifera* (20) and *Cupulifera* (16) fall below the lowest of the 16 for the flora of Washington (*Umbellifera*, 22), while on the other hand the *Caryophyllaceæ* (27), *Salicaceæ* (23), and *Naiadaceæ* (28), not in the list, rise above that number. These orders in the flora of Washington are represented respectively by 19, 19, and 9 species and varieties. With reference to the last named of these orders, however, it may be remarked that the genus *Potamogeton*, which constitutes the greater part of it, has been very imperfectly studied here, and will certainly be largely increased when thoroughly known.

The orders in which this flora falls below that of Essex County are: the *Gramineæ*, *Cyperaceæ*, *Rosaceæ*, *Filices*, *Ranunculaceæ*, *Ericaceæ*, *Liliaceæ*, *Orchidaceæ*, and *Polygonaceæ*, nine in all. In the remaining seven orders there is a greater number of species here than there. It is

noteworthy that our flora exceeds that of Essex County most in the *Compositæ*, *Leguminosæ*, and *Cupulifera*, and next to these in the *Scrophulariaceæ*, *Labiata*, and *Crucifera*. Our comparatively poorest orders are the *Cyperaceæ*, *Rosaceæ*, *Ericaceæ*, and *Filices*.

Comparing in like manner the 15 large genera enumerated on page 35, we are able to see still more definitely wherein the two floras differ:

Rank.	Genera.	Number of species and varieties.	
		Essex county.	Flor Columbia.
1	<i>Carex</i>	71	70
2	<i>Aster</i>	25	21
3	<i>Panicum</i>	14	19
4	<i>Solidago</i>	19	18
5	<i>Quercus</i>	10	18
6	<i>Polygonum</i>	21	16
7	<i>Desmodium</i>	7	14
8	<i>Salix</i>	18	14
9	<i>Juncus</i>	14	14
10	<i>Viola</i>	11	13
11	<i>Cyperus</i>	11	12
12	<i>Ranunculus</i>	13	11
13	<i>Eupatorium</i>	7	11
14	<i>Helianthus</i>	5	10
15	<i>Asclepias</i>	7	10

The total number of species and varieties represented by these 15 genera is thus considerably larger in the Washington flora (271) than in that of Essex County (253); but whereas they are the absolutely largest genera here, this is not the case there. The genus *Potamogeton* numbers 23 in Mr. Robinson's catalogue, and the genus *Scirpus* 14, while several others probably exceed 10. Those in the above list falling below 10, the lowest on the Washington list, are *Desmodium* (7), *Eupatorium* (7), *Asclepias* (7), and *Helianthus* (5). Those in which the Essex flora exceeds the Washington flora are *Carex*, *Aster*, *Solidago*, *Polygonum*, *Salix*, and *Ranunculus*, though *Carex*, *Solidago*, and *Cyperus* may be regarded as equal in the two floras, and *Juncus* is exactly equal. In *Quercus*, *Desmodium*, *Eupatorium*, *Helianthus*, and *Asclepias*, the Essex flora is poor, only amounting in the second and fourth named to half the number found here.

Relative to the above comparisons in general it may be remarked, first, that the flora of Essex County, Massachusetts, is much more thoroughly and exhaustively elaborated than that of the District of Columbia, lying as it does in the immediate center of botanical activity in this country. This alone is probably sufficient to account for all the difference in the number of species in the two localities, and it will probably be ultimately found that the two floras are very nearly equal. In

the second place, if it should be thought that from its intermediate location between the southern and the northern sections of the country our flora should naturally be the more rich in species, it may be satisfactorily urged on the other hand that while we have only an inland territory, Essex County has both an inland and a maritime territory. Could our range be extended to embrace even a small extent of sea-coast, the number would thereby be very largely increased.

As a final statistical exhibit more comprehensive in its scope, and from a different point of view, I give below a table in which our local flora is compared not only with the floras above named, but with several others in America. As these several floras not only overlap to considerable extent, but also differ widely in the total number of plants embraced by each, it is evident that a numerical comparison would convey a very imperfect idea of the variety in their essential characteristics. It is therefore necessary to reduce them to a common standard of comparison, which has been done by disregarding the actual numbers and employing only the percentage which each group compared bears to the total for each respective flora. The relation of the several groups to the total vegetation of each flora is thus clearly brought out, and a comparison of the percentages of the same group in the different areas displays in the clearest manner possible the relative predominance or scantiness of the group in each flora. Upon this must depend, in so far as botanical statistics can indicate it, the *facies* of each flora—its peculiarities and its characteristics. As in previous comparisons, the table is restricted to Phanogamous and vascular Cryptogamous plants, and the same groups are employed, except that the large genera are omitted, while the number of orders is increased to the 23 largest of this flora, which is taken as the basis of comparison, and they are arranged in the order of rank with reference to it.

The several floras compared, with the total number of plants embraced in each, are as follows:

1. Flora of Washington and vicinity.....	1, 249
2. Flora of Essex County, Mass.....	1, 324
3. Flora of the State of Illinois	1, 542
4. Flora of the Northeastern United States	2, 365
5. Flora of the Southeastern United States	2, 696
6. Flora of the Eastern United States (= 4 + 5)	4, 034
7. Plants collected by the Fortieth Parallel Survey	1, 254
8. Plants collected by Lieutenant Wheeler's Survey	1, 535

For the flora of Illinois (No. 3), and also for that of the Northern United States east of the Mississippi (No. 4), I have used without veri-

fication the figures of the *Catalogue of the Plants of Illinois*, 1876, prepared by Mr. Harry N. Patterson, as summarized in the preface. In the former case the introduced species are included, but the varieties seem to be excluded. In the latter case, as stated by Mr. Patterson, the introduced species are excluded, as are also, doubtless, the varieties.

For the flora of the Southern United States east of the Mississippi (No. 5), which I have compiled from Dr. Chapman's *Flora of the Southern States*, indigenous species are alone taken, in order to make it conform as nearly as possible to the flora of the Northeastern United States (No. 4).

The plants collected by the Fortieth Parallel Survey (No. 7), and those collected on Lieutenant Wheeler's Survey (No. 8), are introduced rather as a means of contrasting the eastern with the western portions of the continent than as a proper part of the comparative botanical statistics of this vicinity. The former of these collections was very thoroughly and carefully made by an energetic and experienced botanist, Mr. Sereno Watson, and derives its chief value from this fact. It embraces, however, a territory having a somewhat special character from a botanical point of view, viz., in general terms, the Great Basin between the Rocky Mountains and the Sierra Nevadas, and the High Plateaus and mountains immediately adjacent (Wasatch, Uintas, Sierras), with a restricted range north and south. The data are taken from the summary of the work prepared by Mr. Watson, and found on page xlv of the report. The collections embraced in the report of Lieutenant Wheeler's Survey, on the other hand, were made by numerous collectors, some of them amateurs, and were scattered over a very wide extent of Western territory, including Colorado, New Mexico, Utah, Arizona, and Nevada, and continued through five years of exploration. They may be taken, therefore, to represent with some correctness the general character of our Western flora, exclusive of the Pacific coast. The facts given are derived from the "Table of Orders" on page 379. In both cases varieties are excluded.

For the remaining floras compared in the table (Nos. 1, 2, and 6), to avoid recompilation, the data previously used are repeated, species and varieties, including also introduced plants, being employed. As already intimated, however, this difference in the basis of compilation of different floras, applying as it does to the several groups and to the aggregate alike, cannot materially affect the percentages as computed.

The following is the table of percentages :

Series, Classes, and Divisions.		Flora of Wash- ington and vicinity.	Flora of Essex Coun- ty, Massachusetts.	Flora of the State of Illinois.	Flora of the North- eastern United States.	Flora of the South- eastern United States.	Flora of the total Eastern United States.	Plants collected by the Fortieth Par- allel Survey.	Plants collected by Lieutenant Wheel- er's Survey.
Polypetalæ		28.5	27.2	28.5	26.8	28.9	27.6	35.1	31.9
Gamopetalæ		31.1	27.0	32.2	31.6	34.7	32.6	36.0	35.8
Total Dichlamydeæ		59.6	54.2	60.7	58.4	63.6	60.2	71.1	67.7
Monochlamydeæ		9.9	10.0	9.8	7.9	8.8	8.7	9.8	10.6
Total Dicotyledons		69.5	64.2	70.5	66.3	72.4	68.9	80.9	78.3
Monocotyledons		26.5	29.6	25.5	29.0	24.3	25.6	16.4	15.7
Gymnosperms		0.6	1.3	0.7	0.9	0.7	0.7	1.2	1.3
Total Phænogamia		96.6	95.1	96.7	96.2	97.4	95.2	98.5	95.3
Cryptogamia		3.4	4.9	3.3	3.8	2.6	4.8	1.5	4.7
Total Vascular Plants		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Rank.	Orders.	Flora of Wash- ington and vicinity.	Flora of Essex Coun- ty, Massachusetts.	Flora of the State of Illinois.	Flora of the North- eastern United States.	Flora of the South- eastern United States.	Flora of the total Eastern United States.	Plants collected by the Fortieth Par- allel Survey.	Plants collected by Lieutenant Wheel- er's Survey.
1	Compositæ	11.9	10.3	13.0	12.2	13.7	12.3	16.5	16.6
2	Gramineæ	8.9	9.7	7.8	7.5	7.2	7.4	5.4	7.8
3	Cyperaceæ	8.6	9.1	8.5	10.5	8.0	8.9	4.4	3.8
4	Leguminosæ	4.6	12.9	4.7	4.3	6.1	5.2	7.2	8.2
5	Rosaceæ	3.7	4.2	3.2	3.0	2.2	2.6	3.4	2.9
6	Labiata	3.4	2.6	2.3	2.2	2.8	3.0	0.9	2.2
7	Crucifera	2.6	2.2	2.1	2.0	1.4	1.9	4.4	2.8
8	Scrophulariaceæ	2.6	2.2	2.7	2.3	2.5	2.4	4.5	4.8
9	Filices	2.4	3.0	1.3	2.4	2.1	2.3	1.0	4.3
10	Ranunculaceæ	2.3	2.3	1.7	2.3	1.9	2.0	3.0	2.3
11	Ericaceæ	2.1	2.8	0.9	1.9	2.0	2.2	1.3	0.9
12	Cupulifera*	2.1	1.8	1.4	1.5	1.3	1.4	0.4	0.9
13	Liliaceæ	1.9	2.0	2.1	2.4	2.1	2.0	3.0	1.5
14	Orchidaceæ	1.9	2.4	1.8	2.4	1.9	1.7	0.6	0.5
15	Polygonaceæ	1.8	2.0	1.9	1.1	1.5	1.4	4.0	3.2
16	Umbellifera	1.8	1.5	1.8	1.7	1.6	1.6	2.4	1.2
17	Caryophyllaceæ	1.5	2.0	1.4	1.5	1.5	1.5	2.2	1.6
18	Salicaceæ	1.5	1.7	1.2	0.8	0.3	0.7	0.9	0.8
19	Onagraceæ	0.9	1.1	1.2	1.2	1.3	1.1	2.3	2.4
20	Saxifragaceæ	0.7	1.0	0.8	1.5	0.9	1.1	2.1	1.4
21	Chenopodiaceæ	0.7	1.3	0.7	0.5	0.5	0.6	2.1	1.5
22	Naiadaceæ	0.7	2.1	1.2	1.2	0.4	1.0	0.7	0.3
23	Polemoniaceæ	0.5	0.1	0.5	0.3	0.5	0.4	3.3	1.8

* Including the Betulaceæ.

Comparisons have already been made of our local flora with that of Essex County, Massachusetts, which contains so nearly the same number of plants. In examining the percentages in the above table these distinctions are equally manifest. In both divisions of the *Dichlamydeæ*, and also in the total Dicotyledons and the total *Phænogamia*, our flora is richer than that of Essex County, while in the *Monochlamydeæ*, the Monocotyledons, the Gymnosperms, and the Cryptogams it falls below. In the *Compositæ*, *Leguminosæ*, *Labiataæ*, *Cruciferaæ*, *Scrophulariaceæ*,

Cupuliferæ, and a few other orders, it is in excess, while in the *Gramineæ*, *Cyperaceæ*, *Rosaceæ*, *Filices*, &c., the Essex flora leads.

In the comparison with the flora of the State of Illinois one is struck by the marked similarity in the position of the groups, notwithstanding the well-known differences in the actual species. In the *Gamopetalæ* and total *Dichlamydeæ*, as also in the *Monochlamydeæ*, the difference is very slight, while in the *Polypetalæ* it disappears entirely. The Dicotyledons are therefore nearly the same, and we find this true also of the Monocotyledons and the Gymnosperms. Whatever slight variations occur in the above-named groups, they are so adjusted as nearly to balance each other, so that when we reach the total *Phænogamia* we again have substantial unison, which, of course, is maintained in the *Cryptogamia*.

This harmony is less pronounced in the larger orders, the *Compositæ* being richer and the *Gramineæ* poorer there than here. In the *Cyperaceæ*, *Leguminosæ*, *Scrophulariaceæ*, and *Filices* the difference is not great, but in the *Rosaceæ*, *Labiata*, *Crucifera*, and *Cupuliferæ* the Washington flora is decidedly in advance, and in the *Ericaceæ* it is of course in very marked contrast. In the *Orchidaceæ*, *Polygonaceæ*, *Umbelliferæ*, *Caryophyllaceæ*, and *Polemoniaceæ* there is substantial or exact identity. In the *Ranunculaceæ*, *Onagraceæ*, *Naiadaceæ*, and *Liliaceæ*, besides the *Compositæ*, already mentioned, the Illinois flora leads that of Washington. On the whole, there is a remarkable similarity in the *facies* of these two floras, which may be due to their inland situation, with fluvial areas and similar position as to latitude. Considering, however, the marked specific peculiarities of the flora of the flat prairies of the West, we would have naturally looked for a corresponding distinctiveness in the larger groups and orders.

The comparison of our flora, from this point of view, with those of the Northern and of the Southern States east of the Mississippi River, and with these two combined, as represented in the next three columns, proves of the highest interest and will repay somewhat close inspection. It has often been asked to what extent the flora of Washington is affected by influences of a peculiarly southern character, and while it has generally been conceded that it belongs clearly to the northern section of the country, many facts, such as those previously set forth relative to autumnal flowering and early flowering, as well as to the number of species which exhibit more or less green foliage throughout the winter, combine to give it a decidedly southern aspect. In so far as the method which

has been here adopted of testing such questions can be relied upon, this southern leaning on the part of the Washington flora is clearly exhibited in this table. In letting the eye follow columns 4 and 5 the differences are well marked in nearly all the groups and in most of the large orders. These are what express statistically the essential characteristics of the northern as contrasted with the southern flora. It is also obvious that the figures in column 6 will in most cases express the mean between these two extremes. To obtain the true position of our flora, it is necessary to observe toward which of these extremes it most nearly approaches, and whether it falls on the northern or southern side of the mean established by column 6. In instituting this comparison we perceive at the outset that in the Polypetalous Division it falls so far on the southern side as to come within four-tenths of one per cent. of being identical with the flora of the Southern States. In the *Gamopetalæ*, however, it agrees quite closely with the flora of the Northern States, so that in the *Dichlamydeæ*, as a whole, it coincides very well with the mean for both sections. The *Monochlamydeæ* agree better with those of the Southern States, and the total Dicotyledons fall largely on the southern side of the mean. The Monocotyledons also fall somewhat on the southern side, while the Gymnosperms are below the mean which here corresponds with the southern flora. This leaves the total Phanogams occupying an intermediate position. The Cryptogams are also very nearly intermediate, though approaching the northern side.

Considering next the relations of the large orders, we find that in the *Compositæ* our flora is northern in aspect. In the *Gramineæ* it is very exceptionally rich, surpassing all the larger areas and approaching that of Essex County, Massachusetts. In the *Cyperaceæ*, which are peculiarly typical for the purpose on account of being all indigenous in all the floras, it does not correspond at all either with the northern section or with the average of both sections, but does agree very closely with the exceptionally meager representations of the southern flora. The *Leguminosæ* are here northern in aspect, the *Rosaceæ*, like the *Gramineæ*, exceptionally rich, far exceeding either section, as is also the case with the *Labiata* and the *Crucifera*. The ferns are northern in their degree of representation, as are the *Ranunculaceæ*, while the *Ericaceæ* and *Scrophulariaceæ* are southern. The *Cupulifera* again are anomalous and tower above all other floras. The *Liliaceæ* are southern, as are also the *Orchidaceæ*. The *Polygonaceæ* are in excess and in so far southern in aspect, while the *Umbellifera*, also in excess, denote a northern inclina-

tion. The *Caryophyllaceæ* are remarkable for showing the same percentage in all of the four floras now under comparison. The *Salicaceæ* are largely in excess of every flora compared in the table except that of Essex County, Massachusetts, while the *Onagraceæ* and *Saxifragaceæ* both fall below the normal, the latter, however, showing a southern tendency. The *Naiadaceæ* are southern, as are also the *Polemoniaceæ*, while the *Chenopodiaceæ* are slightly in excess in their degree of representation.

Now, as this locality has been classed as northern, we should not expect to find it occupying an intermediate position, which would place it on the boundary line between the northern and the southern flora, but we should expect to find it agreeing closely with the northern flora, or at least lying midway statistically, as it does geographically, between the dividing line or medium represented by the total eastern flora and the northern flora. So far from this being the case, however, we actually find it occupying a position considerably below this medium line and between this and the line of the southern flora; a position which would be geographically represented by the latitude of Nashville or Raleigh, or even by Memphis or Chattanooga.

This result is very remarkable, and while the proofs from statistics are perhaps not alone to be relied upon, it serves to confirm many facts recorded in this work, and others not yet recorded, which have puzzled the observers of the phenomena of the vegetable kingdom in this locality.

The results of the careful comparison of the two remaining columns need not be here summed up, as the reader will readily perceive their general import, and he will not be likely to stop with considering the relations of the local flora with those of the far West, but will probably seek for more general laws governing the vegetation of the eastern and western sections, as we have already done to some extent for the northern and southern sections.

X. ABUNDANT SPECIES.

It was Humboldt who remarked that of the three great Kingdoms of Nature—the Mineral, the Vegetable, and the Animal—it is the Vegetable Kingdom which contributes most to give character to a landscape. This is very true, and it is also true that botanists rarely take account of this fact. The latter are always interested in the relative numbers of species belonging to different Classes, Families, and Genera, rather than to the mere superficial aspect of the vegetation. It is, however, not the num-

ber of species, but of individuals, which give any particular flora its distinguishing characteristics to all but systematic botanists; and it is also upon this that in the main depends the commercial and industrial value of the plant-life of every region of the globe. It is often the omnipresence of a few, or even of a single, abundant species that stamps its peculiar character upon the landscape of a locality. This is to a far greater extent true of many other regions, especially in the far West, than it is of this; the vegetation of the rural surroundings of Washington is of a highly-varied character, as much so perhaps as that of any other part of the United States; and yet there are a comparatively few species which from their abundance chiefly lend character to the landscape and really constitute the great bulk of the vegetation.

The most prominent, if not actually the most numerous, of these are, of course, certain trees, and notably several species of oak. Probably the most abundant tree everywhere here, as in nearly all parts of the country, is *Quercus alba*, the white oak; but *Q. Prinus*, the chestnut oak, *Q. coccinea*, the scarlet oak, *Q. palustris*, the swamp oak, and *Q. falcata*, the Spanish oak, are also exceedingly common. The most abundant hickory is *Carya tomentosa*, the mocker-nut. *Liriodendron Tulipifera*, the tulip-tree, often improperly called white poplar, besides being one of the commonest trees, is the true monarch of our forests, often attaining an immense size. It is a truly beautiful tree, whose ample foliage well warrants the recent apparently successful experiments in introducing it as a shade-tree for the streets of the city. Among other common trees may be mentioned the chestnut (*Castanea vulgaris*, Lam., var. *Americana*, A. DC.), the beech (*Fagus ferruginea*), the red maple (*Acer rubrum*), the sycamore (*Platanus occidentalis*), the red or river birch (*Betula nigra*), the white elm (*Ulmus Americana*), the sour gum (*Nyssa multiflora*), the sweet gum (*Liquidambar styraciflua*), the scrub pine (*Pinus inops*), the pitch-pine (*P. rigida*), and the yellow pine (*P. mitis*).

Of the smaller trees, *Cornus florida*, the flowering dogwood, and *Cercis Canadensis*, the red-bud or Judas tree, are very abundant and chiefly conspicuous in the spring from the profusion of their showy blossoms; all three species of sumac are common; *Hamamelis Virginica*, the witch-hazel, and *Viburnum prunifolium*, the black-haw, abound; *Sassafras officinale*, the sassafras, *Castanea pumila*, the chinquapin, and *Juniperus Virginiana*, the red cedar, also belong to this class.

Of the smaller shrubby vegetation we may safely claim as abundant *Cornus sericea* and *C. alternifolia*, the silky, and the alternate-leaved

cornel; *Viburnum acerifolium*, *V. dentatum*, and *V. nudum*, arrow-woods; *Gaylussacia resinosa*, the high-bush huckleberry; *Vaccinium stamineum*, the deerberry; *V. vacillans* and *V. corymbosum*, the blueberries; *Leucothoe racemosa*; *Andromeda Mariana*, the stagger-bush; *Kalmia latifolia*, the American laurel or calico-bush; *Rhododendron nudiflorum*, the purple azalea or pinxter-flower; and *Lindera Benzoin*, the spice-bush.

Of vines, besides three species of grape which are abundant, we have *Ampelopsis Virginiana*, the Virginian creeper or American woodbine, *Rhus Toxicodendron*, the poison ivy, and *Tecoma radicans*, the trumpet vine, which give great beauty and variety to the scenery.

The most richly represented herbaceous species may be enumerated somewhat in their systematic order. Of *Polypetalæ* may be mentioned *Ranunculus repens*, *Cimicifuga racemosa*, *Dentaria laciniata*, *Viola cucullata*, *V. pedata*, var. *bicolor*, and *V. tricolor*, var. *arvensis*; *Stellaria pubera*, *Cerastium oblongifolium*, *Geranium maculatum*, *Impatiens pallida*, and *I. fulva*; *Desmodium nudiflorum*, *D. acuminatum*, and *D. Dillenii*; *Vicia Caroliniana*, *Potentilla Canadensis*, *Geum album*, *Saxifraga Virginiensis*, *Oenothera fruticosa*, and *Thaspium barbinode*. In the *Gamopetalæ* before *Compositæ* we have *Galium Aparine*, *Mitchella repens*, *Houstonia purpurea*, and *H. cærulea*. In the *Compositæ* the most conspicuous are *Vernonia noveboracense*, *Eupatorium purpureum*, *Liatris graminifolia*, *Aster patens*, *A. ericoides*, *A. simplex*, and *A. miser*; *Solidago nemoralis*, *S. Canadensis*, *S. altissima*, and *S. ulmifolia*; *Chrysopsis Mariana*, *Ambrosia trifida*, and *A. artemisiifolia* (these behaving like introduced weeds); *Helianthus divaricatus*, *Actinomeris squarrosa*, *Rudbeckia laciniata*, and *R. fulgida*; *Coreopsis verticillata*, *Bidens cernua*, *Verbesina Siegesbeckia*, *Gnaphalium polycephalum*, *Antennaria plantaginifolia*, *Hieracium venosum*, and *H. Gronovii*; *Nabalus albus* and *N. Fraseri*; *Lactuca Canadensis*.

The remaining *Gamopetalæ* furnish as abundant species: *Lobelia spicata*, *Chimaphila umbellata*, and *C. maculata*; *Veronica officinalis* and *V. Virginica*; *Gerardia flava*, *Verbena hastata*, and *V. urticæfolia*; *Pycnanthemum incanum* and *P. linifolium*, *Collinsonia Canadensis*, *Salvia lyrata*, *Monarda fistulosa*, and *M. punctata*; *Nepeta Glechoma*, *Brunella vulgaris*, *Mertensia Virginica*, *Phlox paniculata*, and *P. divaricata*; *Solanum Carolinense* and *Aselepias Cornuti*.

Of herbaceous *Monochlamydeæ* may be named *Polygonum Virginianum*, *P. sagittatum*, and *P. dumetorum*; *Laportea Canadensis*, *Pilea pumila*, and *Bæhmeria cylindrica*.

The Monocotyledons give us *Arisema triphyllum*, the Indian turnip, *Sagittaria variabilis*, *Aplectrum hyemale*, *Erythronium Americanum*, *Luzula campestris*, *Juncus effusus*, *J. marginatus*, and *J. tenuis*; *Pontederia cordata*. Of the *Cyperi*, *C. phymatodes*, *C. strigosus*, and *C. ovularis* are the most common; *Eleocharis obtusa* and *E. palustris*, *Scirpus pungens*, *S. atrovirens*, *S. polyphyllus*, and *S. Eriophorum* are very conspicuous. Of *Carices*, *C. crinita*, *C. intumescens*, the various forms of *C. laxiflora*, *C. platyphylla*, *C. rosea*, *C. scoparia*, *C. squarrosa*, *C. straminea*, *C. angustata*, *C. tentaculata*, *C. virescens*, and *C. vulpinoides* are the most obtrusive.

In the *Gramineæ*, those which most uniformly strike the eye are *Agrostis scabra*, *Muhlenbergia Mexicana*, and *M. sylvatica*; *Tricuspis sesleroides*, *Eatonia Pennsylvanica*, *Poa pratensis*, *P. sylvestris*, and *P. brevifolia*; *Eragrostis pectinacea*, *Festuca nutans*, *Bromus ciliatus*, *Elymus Virginicus*, *Danthonia spicata*, *Anthoxanthum odoratum*, *Panicum virgatum*, *P. latifolium*, *P. dichotomum* (with a multitude of forms), and *P. depauperatum*; *Andropogon Virginicus* and *A. scoparius*.

Of ferns, *Polypodium vulgare*, *Pteris aquilina*, *Adiantum pedatum*, *Asplenium ebeneum*, and *A. Filix-fœmina*; *Phegopteris hexagonoptera*, *Aspidium acrostichoides*, *A. marginale*, and *A. Noveboracense*; *Osmunda regalis*, *O. Claytoniana*, and *O. cinnamomea* are the most constantly met with. *Lycopodium lucidulum* is quite common, and *L. complanatum* is very abundant in certain localities.

Besides the above, which are all indigenous to our flora, there are of course many introduced species in the vicinity of the city and of cultivation everywhere, which manifest here as elsewhere their characteristic tendency to crowd out other plants and monopolize the soil.

Such are the most general features which the traveler, accustomed to observe the vegetable characteristics of localities visited, may expect to see when he pays his respects to the Potomac Valley. To some, even this imperfect description might furnish a fair idea of our floral scenery without actually seeing it.

XI. CLASSIFICATION ADOPTED.

In endeavoring to conform to the latest authoritative decisions relative to the most natural system of classification, I have followed, with one exception, the arrangement of the *Genera Plantarum* of Bentham and Hooker, so far as this goes, and the accepted authorities of Europe and America for the remainder. For the *Gamopetalæ* after *Compositæ*, however, covered by Professor Gray's *Synoptical Flora of North America*, I have followed that work, which is substantially in harmony with

the *Genera Plantarum*. In the arrangement of the orders, too, for the *Polypetalæ*, Mr. Sereno Watson's *Botanical Index* has in all cases been conformed to, as also not materially deviating from the order adopted by Bentham and Hooker. In the genera there are numerous discrepancies between the works last named, and in the majority of these cases the American authorities have been followed. For example, Bentham and Hooker have thrown *Dentaria* into *Cardamine*, *Elodes* into *Hypericum*, *Ampelopsis* into *Vitis*, and *Pastinaca* and *Archemora* into *Peucedanum*. The change of *Spergularia* to *Lepigonum* is adopted, as well as a few alterations in orthography where the etymology seemed to demand them, as *Pyrus* to *Pirus* and *Zanthoxylum* to *Xanthoxylum*. I have also declined to follow Bentham and Hooker in the changes which they have made in the terminations of many ordinal names. The termination *aceæ* is doubtless quite arbitrary in many cases, and perhaps cannot be defended on etymological grounds, but as a strictly ordinal ending it has done good service in placing botanical nomenclature on a more scientific footing. It is also true that the old system does not always employ it, as in some of the largest orders, *e. g.* *Cruciferae*, *Leguminosæ*, *Compositæ*, *Labiatae*; but whatever changes are made should rather be in the direction of making it universal than less general. Bentham and Hooker do not adopt a universal termination, neither do they abolish the prevailing one, and they retain it in the majority of cases; but in certain cases, for which they doubtless have special reasons, they substitute a different one, and one which is often far less euphonious. The following are the orders represented in this catalogue in which the termination *aceæ* is retained by American and altered by English authorities:

American.	English.	American.	English.
Berberidaceæ.	Berberidææ.	Cactaceæ.	Cactææ.
Cistaceæ.	Cistineæ.	Valerianaceæ.	Valerianeæ.
Violaceæ.	Violariææ.	Aselepiadaceæ.	Aselepiadææ.
Polygalaceæ.	Polygalææ.	Gentianaceæ.	Gentianeæ.
Caryophyllaceæ.	Caryophylleæ.	Boraginaceæ.	Boragineæ.
Portulacaceæ.	Portulacææ.	Scrophulariaceæ.	Scrophularineæ.
Hypericaceæ.	Hypericineæ.	Lentibulaceæ.	Lentibulariææ.
Celastraceæ.	Celastrineæ.	Plantaginaceæ.	Plantagineæ.
Vitaceæ.	Ampelideæ.	Nyctaginaceæ.	Nyctagineæ.
Saxifragaceæ.	Saxifrageæ.	Lauraceæ.	Laurineæ.
Hamamelaceæ.	Hamamelideæ.	Juglandaceæ.	Juglandææ.
Lythraceæ.	Lythrarieæ.	Salicaceæ.	Salicineæ.
Onagraceæ.	Onagrarieæ.	Ceratophyllaceæ.	Ceratophylleæ.
Passifloraceæ.	Passifloreæ.		

On the other hand, the British authorities are followed in uniting the *Saururaceæ* with the *Piperaceæ*, and also in placing the *Paronychieæ*, reduced to a sub-order, under the *Illecebraceæ*; but from the certain relationship of this order with the *Caryophyllaceæ*, it is deemed unnatural to separate these two orders by putting the former into the Monochlamydeous Division. (See *American Naturalist*, November, 1878, p. 726.) On the same ground of apparently close relationship, I have followed Bentham and Hooker in abolishing the *Callitrichaceæ* and placing *Callitriche* in the *Haloragaceæ*. But I have followed Gray and Watson in keeping the *Fumariaceæ* distinct from the *Papaveraceæ*, and the *Lobeliaceæ* from the *Campanulaceæ*, as also in preserving the *Ericaceæ* intact, and not slicing off the *Vacciniaceæ* from one end and the *Monotropeæ* from the other, as is done in the *Genera Plantarum*.

In the *Gamopetalæ* before, and including *Compositæ*, in the *Monochlamydeæ*, and throughout the Monocotyledons, serious difficulties occur in consequence of a want of recent systematic works from the American point of view. In nearly all cases the names as well as the arrangement of Gray's *Manual*, fifth edition, have here been adopted. I have, however, been able to avail myself of a number of recent revisions of genera made by Gray, Watson, and Engelmänn,* and published in various forms, chiefly in the Proceedings of the American Academy of Arts and Sciences. I have also derived many useful hints from the *Flora of California*, from the botanical reports of the various Western surveys, from Sargent's *Catalogue of the Forest Trees of North America*, and from the *Flora of Essex County, Massachusetts*.

Mr. M. S. Bebb, of Rockford, Ill., has shown great kindness, not only in determining all the uncertain *Salices*, but in generously drawing up a list of them in the order of their nearest natural relationships, which is followed implicitly in the catalogue.

For the ferns, the magnificent work of Professor Eaton has furnished everything that could be desired, and is unswervingly adhered to.

The following genera in the *Compositæ* have been changed by Bentham and Hooker, but the new names cannot be adopted until the species have

* While I have gladly adopted the arrangement of the species of *Quercus*, decided upon by Dr. Engelmänn after so careful a study, I cannot do so without recording a gentle protest against the position to which he assigns *Q. palustris*, viz., between *Q. falcata* and *Q. nigra*, and far removed from *Q. rubra*. Not only its shallow, finely-scaled cup, but especially its light-colored buds and thin early leaves, as also a special *facies* belonging to its aments and foliage, ally this species with *Q. rubra*, and distinguish these two species as a group from all others found in this flora.

been worked up by American botanists. The old ones are therefore retained with a simple indication of the recent disposition:

Diplopappus has been included in Aster.

Maruta has been included in Anthemis.

Leucanthemum has been included in Chrysanthemum.

Cacalia has been included in Senecio.

Lappa has been made Aretium.

Cynthia has been included in Krigia.

Mulgedium has been included in Lactuca.

Nabalus has been made Prenanthes.

Valerianella, Moench, has also been made co-extensive with *Fedia*, Gaertn., and is preferred by those authors.

Several of these cases are a return to the older names, and whether they will be adopted by American authorities it is impossible to say.

Two discrepancies are noted between the *Genera Plantarum* and Gray's *Synoptical Flora*: The genus *Steironema* is wholly ignored by Bentham and Hooker, unless the reference to *Steiromeria* in the Addenda to Vol. II (p. 1240) refers to it with an erroneous orthography. Professor Gray also declines to follow the English botanists in referring *Acerates* to *Gomphocarpus*.

It remains to consider the one deviation above referred to from the prevailing system of botanical classification which it has been thought proper to make in the subjoined list of plants. This consists in placing the Gymnosperms, here represented only by the single order *Conifera*, after the Monocotyledons and next to the Cryptogams. It is not the proper place here to state the already well known grounds upon which this position of the Gymnosperms has been defended. (See *American Naturalist*, June, 1878, pp. 359 to 378.) It is sufficient to point out that the correctness of this arrangement was recognized by Adrien de Jussieu, and has been repeatedly maintained by later botanists of eminence. The object in adopting it here, however, is not simply because it seems fully justified by the present known characters of plants, for consistently to do this would also require that the *Polypetales* be placed before the *Monochlamydeae* (in the descending series), and that numerous other changes be made. So wide a departure from the existing system would seriously detract from the convenience of the work as a practical aid to the local botanist, and, aside from the labyrinth of nice and critical points into which it must inevitably lead, would not be advisable in the present state of botanical literature. But as the position

of the Gymnosperms is the most glaringly inconsistent of all the defects of the present so-called Natural System, and as the *Conifera* are represented here by only four genera and seven species, it is evident that no serious objection could arise on the ground of inconvenience, while at the same time it may serve some useful purpose in directing the minds of botanists who may look over the work to the obvious rationality of this classification, and contribute its mite toward awakening them to the recognition of a truth which, I cannot doubt, must sooner or later find expression in all accepted versions of the true order of Nature with respect to the vegetable kingdom.

XII. COMMON NAMES.

I am well aware that in recent times it has become more and more the practice among botanists to eschew all common or popular names of plants. This sentiment I share to a great extent, and will therefore remark at the outset that the best common name for a plant is always its systematic name, and this should be made a substitute for other popular names wherever and whenever it can be done. In most cases the names of the genera can be employed with entire convenience and safety; and in many cases they are to be defended on the ground of euphony. How much better, for example, the name *Brunella* sounds than either Self-heal or Heal-all; both of which latter, so far as their meaning goes, express an utter falsehood. Some works professing to give common names frequently repeat the generic name as such. This has seemed to me both unnecessary and calculated to mislead. It is not done where other accepted common names exist, and thus the implication is that in such cases it is incorrect to use the Latin name. Again, it is only done for the commoner species, leaving it to be inferred that there is no popular way of designating the rarer ones. The plan here followed is to regard the genus the best name to use in all cases and as, *ex officio*, the proper common name of every plant, and therefore not in need of being repeated in different type as such in any case. But in addition it has been deemed best to give such appropriate or well-established common names as can be found. Some scientific men seem disposed to forget that it is the things rather than the names that constitute the objects of scientific study. There is a vast amount of true scientific observation made by mere school-girls and rustics who do not know the name of the branch of science they are pursuing. A knowledge of a plant by whatever name or by no name at all is scien-

tific knowledge, and the devotees of science should care less for the means than the end which they have in view. Individuals differ in their constitution and character. The sound or sight of a Latin word is sometimes sufficient, in consequence of ineradicable constitutional or acquired idiosyncrasies, to repel a promising young man or woman from the pursuit of a science for which genuine aptitude and fondness exist. For such and other classes common English names have a true scientific value. The object should be to inspire a love for plants in all who can be made to take an interest in them, and to this end to render the science of botany attractive by every legitimate means available. In so far, therefore, as English names of plants can be made conducive to this end they should be employed. Their inadequacy to the true needs of the science in its later stages cannot fail to impress itself upon all who pursue it to any considerable extent.

Finally, common names are not wholly without their scientific uses. A few of them have proved more persistent than any of the systematic names, as I have had occasion to observe in examining the *Prodromus Floræ Columbianæ* of 1830, in which difficult work, I must confess, they frequently rendered me efficient aid in determining the identity of plants which the Latin names used did not reveal.

In appending common names to the plants of this vicinity, the *Native Wild Flowers and Ferns of the United States*, by Prof. Thomas Meehan, has been followed in most cases so far as this work goes; but this of course embraces but a fraction of the entire flora. Most of the remaining names are taken from Gray's *Manual of Botany* and from his *Synoptical Flora of the United States*. In many cases some of the names given, which do not seem appropriate, are omitted, and in a few cases those given have been slightly changed. A small number of local names not found in any book, but in themselves very expressive, have been given, as "Curly-Head" for *Clematis ochroleuca*, &c.; and in a few other cases names have been assigned to abundant species on the analogy of those given for allied genera or species.

XIII. CONCLUDING REMARKS.

The foregoing remarks on the value of common names naturally suggest a few general reflections, with which our introduction will conclude.

The popularization of science is now a leading theme of scientific men. To accomplish this, certain branches of science must first become a part of liberal culture. The pursuit of fashion, which is usually re-

garded as productive solely of evil, may be made an agency of good. If, for example, it could become as much of a disgrace to be found ignorant of the flora or fauna of one's native place as it now is to be found ignorant of the rules of social etiquette or the contents of the last new novel, devotees of botany and natural history would immediately become legion, and the woods and fields would be incessantly searched for specimens and objects of scientific interest. It should be the acknowledged work of educationalists to make science fashionable, and call to their aid these powerful social sentiments in demanding the recognition of its legitimate claims.

Of all the natural sciences, that of botany is the most easily converted into a branch of culture. Its objects appeal directly to the highest esthetic faculties. It naturally allies itself with the arts of drawing, painting, and sketching, and the deeper the insight into its mysteries the more strongly does it appeal to the imagination. Its pursuit, besides being the best possible restorer of lost, and preserver of good health, is a perpetual source of the purest and liveliest pleasure. The companionship of plants, which those who do not know them cannot have, is scarcely second to that of human friends. The botanist is never alone. Wherever he goes he is surrounded by these interesting companions. A source of pure delight even where they are all familiarly known to him, unlike those of his own kind, they grow in interest as their acquaintance grows less intimate, and in all his travels they multiply immensely his resources of enjoyment. The man of science wonders what the unscientific can find to render travel a pleasure, and it must be confessed that a great many tourists of both sexes go at the behest of fashion, and care little more for Nature when crossing the Alps than did Julius Cæsar, who could only complain of the bad roads and while away the hours in writing his grammatical treatise, *De Analogia*. While all forms of natural science, so far from paralyzing the esthetic faculties, tend powerfully to quicken them, that of natural history, and especially of botany, awakens such an interest in Nature and her beautiful objects that those who have once tasted pleasures of this class may well consider other pleasures insipid.

But notwithstanding these attractions, which botany possesses above other sciences, there exists among a small class of scientific men a disposition to look down upon it as lacking scientific dignity, as mere pastime for school-girls or fanatical specialists. This feeling is most obvious among zoölogists, who, some of them, affect to disdain the more humble forms of life and the simplicity of the tame and stationary plant.

This sentiment, though now happily rare, is natural, and really constitutes what there is left of that proud spirit with which man has ever approached the problems of Nature. His first studies disdained even so complicated an organism as man himself, and spent themselves in the pursuit of spiritual entities wholly beyond the sphere of science. Later he deigned to study *mind* detached from body and from matter; still later he attacked some of the higher manifestations of *life*. Ethics came next, and social organization; then anthropological questions were opened, afterwards those of physiology and anatomy, and at last comparative anatomy and structural zoölogy were taken up. Phytology brought up the rear and was long confined to the most superficial aspects. It is only in recent times that plants and all the other lowly organisms have commenced to receive proper attention, and only since this has been done has there been made any real progress in solving the problems of biology. It is a paradox in science that its most complicated forms must first be studied and its simplest forms last, while only through an acquaintance with the latter can a fundamental knowledge of the former be obtained. The history of biological science furnishes many striking illustrations of this truth, the most interesting of which is perhaps to be found in the labors of the two great French savants, Cuvier and Lamarek. The former spent his life and powers in the study of vertebrate zoölogy, amid the most complex living organisms. The latter devoted his energies to botany and to invertebrate zoölogy, including the protozoan and protistan kingdoms. The former founded his great theory of types and his cosmology of successive annihilations and reconstructions of the life of the globe. The latter promulgated his theory of unbroken descent with modification. The conclusions of the former were accepted in his day and are rejected in ours; those of the latter were condemned in his own lifetime, but now form the very warp of scientific opinion.

Let no botanist, therefore, or person contemplating the study of botany, be deterred by the lowly nature of the objects he would cultivate. The humblest flower or coarsest weed may contain lessons of wisdom more profound than can be drawn from the most complicated conditions of life or of mind.

The city of Washington is becoming more and more a center, not only of scientific learning and research, but also of art and every form of liberal culture. Already the public schools have reached out and taken botany into their curriculum, and we have seen that as a field for

the pursuit of this branch of science the environs of the National Capital are in a high degree adapted. Science and culture must go hand in hand. Culture must become more scientific, and science more cultured. Botany has an important part to perform in this work of reconciliation, and there is no good reason why Washington may not become one of the *foci* from which these influences are to radiate. It has been such reflections as these, aside from the practical needs for such a work, that have encouraged me to persevere in this humble, indeed, but not the less laborious task, and if it shall be found useful, to however slight a degree, in promoting these worthy objects, no regrets will ever arise at having undertaken it.

XIV. EXPLANATIONS.

The catalogue which follows, with the accompanying remarks on the several species, will be better understood by attending to the following explanations:

1. The *habitat* of plants is not specified unless it is in some way peculiar or different from that given in the manuals.

2. *Localities* are given only of plants that are confined, so far as known, to a single spot or to the particular places named in connection with them. When the locality is omitted, therefore, it may be inferred that the plant is common, at least in such situations as constitute its natural habitat.

3. The word "rare," said of a plant whose locality is not stated, signifies that there is no particular place where the collector can be sure to find it, although it may have been sparingly found in several places. Attached to a stated locality, the word "rare" implies that the plant is rare, and perhaps no longer obtainable, in that locality. Localities given without this word may be depended on to furnish the plants.

4. The general designations, "Reform School," "Terra Cotta," &c., embrace the regions in the vicinity of these points, as more fully described in the introduction.

5. Where a plant has only been found once or quite recently, if discovered by a botanist other than the author, the name of the discoverer is stated, inclosed in parentheses. Credit is thus sought to be given to the true discoverer of all new additions to the flora.*

* Of the 213 additions which have been made to the flora of this vicinity since the publication of the catalogue of 1876, 160, or over 75 per cent., have been the result of the author's own personal investigations.

6. The dates given are usually those of flowering, except in case of the *Carices*, when they indicate the time of fully-developed perigynia, and in the Cryptogams, where it is aimed to show the period of developed spores. As before remarked, they are compiled from actual dates at which the plants have been collected or observed, due allowance being made for the condition of each specimen when collected. While, therefore, many of them may doubtless be found at other dates, the collector will usually be safe in keeping within the limits noted. Where an exact date is stated, this implies that the plant has only been found once and on that date; or if two such dates are given, these are the only times the species has been seen.

7. The date of fruiting is only stated where this is important to the collector, *i. e.*, where it is necessary or preferable that the fruit be collected at a particular time. Where fruiting follows naturally upon flowering, or where the fruit persists so as to be obtainable at any time in the fall or winter, these facts are not specially stated unless they are in some manner peculiar to this locality.

8. In genera embracing a number of species to all of which the common name will apply, this is only given for the first, *e. g.*, *Pycnanthemum linifolium*, Mountain Mint; the designation "Mountain Mint" being equally applicable to *P. incanum*, *P. clinopodioides*, or any other species.

9. Species with the dagger (†) prefixed occur under the same or some other name in Brereton's *Prodromus*.



XV. FLORA.

PHÆNOGAMIA.

DICOTYLEDONS.

RANUNCULACEÆ.

CROWFOOT FAMILY.

† **Clematis ochroleuca**, Ait. CURLY HEAD.

Near Fort Scott and below Hunting Creek, Virginia. Middle of May; fruit in June.

† **Clematis Viorna**, L. LEATHER-FLOWER.

Second week in June; fruit in August.

† **Clematis Virginiana**, L. VIRGIN'S BOWER.

Eastern Branch Marsh. September 1 to 15; fruit in October.

† **Thalictrum anemonoides**, Michx. RUE-ANEMONE. WIND-FLOWER MEADOW-RUE.

Last of March to middle of April; fruit in May.

† **Thalictrum dioicum**, L. EARLY MEADOW-RUE.

Last half of April; fruit in May.

† **Thalictrum purpurascens**, L. PURPLE MEADOW-RUE.

May 20 to June 10.

Thalictrum purpurascens, L., var. **ceriferum**, C. F. Austin. WAX-LEAVED MEADOW-RUE.

High Island, growing very large (2^m to 2½^m high). First week in June.

Thalictrum Cornuti, L. TALL MEADOW-RUE.

June 1 to 20.

† **Anemone Virginiana**, L. VIRGINIAN ANEMONE.

Middle to end of June; fruit late in July.

† **Anemone nemorosa**, L. WIND-FLOWER. WOOD-ANEMONE.

In small patches; not common. Middle to end of April.

† **Anemone Hepatica**, L. [*Hepatica triloba*, Chaix.] LIVER-LEAF. HEPATICA.

Dry wooded hillsides; common. February 20 to April 10.

- †*Ranunculus ambigens*, Watson. [*R. alismafolius*, Geyer.] WATER-PLANTAIN
SPEARWORT.
Eastern Branch Marsh; also, marsh near the mouth of Hunting Creek. Middle of
June; fruit in July.
- †*Ranunculus pusillus*, Poir. SMALL SPEARWORT.
A remarkable form having large floating leaves on long petioles, resembling those
of a *Potamogeton*, was found April 30, 1881, in a partially dried pond near the First
Lock of the Canal. As the locality had been repeatedly examined before, its recent
introduction there seems probable. The typical form occurs on the Potomac Flats
above Eads' Mill.
- †*Ranunculus abortivus*, L. SMALL-FLOWERED CROWFOOT.
April and May.
- Ranunculus abortivus*, L., var. *micranthus*, Nutt.
High Island. April. Autumnal flowers, November 28, 1875.
- †*Ranunculus sceleratus*, L. CURSED CROWFOOT.
Early in May.
- †*Ranunculus recurvatus*, Poir. HOOKED CROWFOOT
First half of May; fruit in June.
- †*Ranunculus repens*, L. CREEPING CROWFOOT.
April. Two marked varieties occur, one upland, small and early blooming and
disappearing; the other in damp ground, glabrous, later, and much larger; throw-
ing out long runners and surviving through the summer. Still a third form spar-
ingly found in wet, springy places, with large, shining, spotted leaves, very late
flowering (third week in May), runners constituting the greater part of the plant,
and the flowers rarely setting fruit. The last found only in one place between
Chain Bridge and Fort Ethan Allen. The two following probably cover these ex-
tremes.
- †*Ranunculus repens*, L., var. *hispidus*, T. & G.
Early in April; fruit in May.
- †*Ranunculus repens*, L., var. *nitidus*, Chapman.
May; fruit in June or July.
- †*Ranunculus bulbosus*, L. BUTTERCUPS.
May.
- †*Ranunculus acris*, L. TALL CROWFOOT.
Early in June.
- †*Aquilegia Canadensis*, L. WILD COLUMBINE.
End of May.
- Delphinium tricornis*, Michx. DWARF LARKSPUR.
Found only on the second of the chain of islands in the Potomac above the
Feeder Dam. Middle to end of April.
- Delphinium Consolida*, L. FIELD LARKSPUR.
Sparingly escaped and depauperate in form. July.
- †*Aconitum uncinatum*, L. WILD MONKSHOOD.
Last half of September.

† *Cimicifuga racemosa*, Nutt. BLACK SNAKEROOT.

Third week in June; fruit late in September.

MAGNOLIACEÆ.

MAGNOLIA FAMILY.

† *Magnolia glauca*, L. LAUREL MAGNOLIA. SWEET BAY.

In all swamps, but being rapidly destroyed by people in search of the flowers. First half of June; fruit, end of August.

† *Liriodendron Tulipifera*, L. TULIP-TREE.

The largest and handsomest of the forest trees of this vicinity. Its introduction as an ornamental shade tree promises to be successful. Third week in May; fruit, August.

ANONACEÆ.

CUSTARD-APPLE FAMILY.

† *Asimina triloba*, Duval. PAPAW.

Common in damp woods. Usually a bush or small tree; a specimen 60^{cm} in girth 75^{cm} above the base was noted on Rock Creek, in the Cascade Ravine. April; fruit ripe in September.

MENISPERMACEÆ.

MOONSEED FAMILY.

Menispermum Canadense, L. CANADIAN MOONSEED.

Leaves exhibiting great variations in the lobation. First week in June; fruit in August.

BERBERIDACEÆ.

BARBERRY FAMILY.

Berberis vulgaris, L. BARBERRY.

Hedge near Edgewood, now destroyed. May.

† *Caulophyllum thalictroides*, Michx. BLUE COHOSH.

High Island. Early in April; fruit in May.

Jeffersonia diphylla, Pers. TWIN-LEAF.

High Island and islands above. Fruit nodding when ripe. Last week in March or first week in April; fruit ripe in May.

† *Podophyllum peltatum*, L. MANDRAKE. MAY-APPLE.

Early in May; fruit ripe in July.

NYMPHÆACEÆ.

WATER-LILY FAMILY.

Brasenia peltata, Pursh. WATER-SHIELD.

Carberry Meadows below Eads' Mill. Suddenly made its appearance in 1880 in a familiar pond. Discovered independently by Dr. Foreman and myself, on the same morning (July 18). Only one flower seen. It reappeared in 1881 and bore fruit (collected July 17), but seems to show diminished vitality.

† *Nuphar advena*, Ait. YELLOW POND-LILY. SPATTER-DOCK

May.

† *Nymphæa odorata*, Ait. SWEET-SCENTED WATER-LILY.

In a pool on the summit of a high rocky headland below Great Falls, July 6, 1879.
Also found the same year by Mr. William Palmer on the Potomac Flats below the Long Bridge, growing among the *Zizania*.

SARRACENIACEÆ.

PITCHER-PLANT FAMILY.

† *Sarracenia purpurea*, L. SIDE-SADDLE FLOWER. PITCHER-PLANT.

Meadow between the Washington Driving Park and Bladensburg, near Beaver Dam Branch. May 21, 1878.

PAPAVERACEÆ.

POPPY FAMILY.

Papaver dubium, L. SMOOTH-FRUITED CORN-POPPY.

High Island, rare. June 23, 1878.

† *Sanguinaria Canadensis*, L. BLOOD-ROOT.

Middle to end of March; fruit in April.

Chelidonium majus, L. CELANDINE.

Not common. First half of May.

FUMARIACEÆ.

FUMITORY FAMILY.

Dicentra Cucullaria, DC. DUTCHMAN'S BREECHES.

April 4 to 20.

Corydalis flavula, Raf. COLIC-WEED.

Middle of March to middle of April; fruit in May.

† *Fumaria officinalis*, L. FUMITORY.

Uniontown. May 10 to 30.

CRUCIFERÆ.

MUSTARD FAMILY.

Nasturtium officinale, R. Br. WATER-CRESS.

Second week in May; continues flowering all summer.

† *Nasturtium sylvestre*, R. Br. YELLOW CRESS.

Hunting Creek and Alexandria. Middle of May.

Nasturtium obtusum, Nutt.

Near the Washington Monument. Few reliable characters can be found to distinguish this species from the next. The fruit cannot be depended upon for this purpose. The large, irregular lobes of the lower leaves serve, however, to give it a different aspect.

Nasturtium palustre, DC. MARSH-CRESS.

Tending to invade the streets and gutters. August and September.

Nasturtium lacustre, Gray. LAKE-CRESS.

Only found in one of the numerous pools among the rocks below Great Falls. In flowering time, at the end of June, it presents three kinds of leaves. The pond in which it has been submersed during the spring, and where it has borne only dissected leaves, is then dry, and the long stems lie prostrate on the muddy bottom with the whorls of these leaves adherent to them. At the base a rosette of broad, green leaves, more or less lobed or lyrate, springs up, while the upper portion of the stem below the flowers bears small, lanceolate or oblong, entire leaves.

Nasturtium Armoracia, Fries. HORSE-RADISH.

Very sparingly escaped.

Barbarea vulgaris, R. Br. WINTER-CRESS.

Early in April.

Barbarea praecox, R. Br. EARLY WINTER-CRESS. SCURVY-GRASS.

First week in April. Rosettes of radical leaves develop during the winter.

† **Arabis lyrata**, L. ROCK-CRESS.

On much exposed rocks. The radical leaves can only be obtained very early in April or even in March. April.

Arabis dentata, Torr. and Gray.

High Island and islands above; also South shore of the Potomac. April.

Arabis patens, Sulliv.

Sandy Landing. Rare. Middle to end of April; pods persistent until August.

Arabis hirsuta, Seop.

Near Sandy Landing. Mr. C. S. Sheldon, May 22, 1881; then with young fruit.

† **Arabis laevigata**, Poir. TOWER-MUSTARD.

April.

† **Arabis Canadensis**, L. SICKLE-POD.

Third week in May; fruit in July.

† **Cardamine rhomboidea**, DC. SPRING-CRESS.

Early in April.

† **Cardamine hirsuta**, L. BITTER CRESS.

Always wholly glabrous. First week in April. Autumnal flowers collected October 3, 1880.

† **Cardamine hirsuta**, L., var. *sylvatica*, Gray.

A much smaller plant than the last, and apparently distinct. Pleasantly flavored. First week in April.

† **Dentaria heterophylla**, Nutt. DIVERSE-LEAVED TOOTHWORT.

Virginia shore of the Potomac, above Georgetown. Middle of March to middle of April.

† **Dentaria laciniata**, Muhl. CUT-LEAVED TOOTHWORT.

Middle of March to middle of April. When this species and the last are found growing together there is a difference of a week in their flowering time, this being the earlier.

Draba ramosissima, Desv. BRANCHING WHITLOW-GRASS.

Rocks at Harper's Ferry; may be looked for nearer. May 30, 1873.

† *Draba verna*, L. WHITLOW-GRASS.

February to April.

Hesperis matronalis, L. ROCKET.

Middle to end of May.

† *Sisymbrium officinale*, Scop. HEDGE-MUSTARD.

May to June.

† *Sisymbrium Thaliana*, Gay. MOUSE-EAR CRESS.

Middle of March to end of April.

Sisymbrium Alliaria, Scop. [*Alliaria officinalis*, Andrz. *Erysimum Alliaria*, L.]

April. Abundant in the Georgetown College Grounds, and now extending westward as far as Foundry Run.

† *Erysimum cheiranthoides*, L. WORM-SEED MUSTARD.

Rather rare. Third week in June.

† *Camelina sativa*, Crantz. FALSE FLAX.

Rather rare and apparently disappearing. Found in the city, in the vicinity of Twentieth street and Virginia Avenue; also above Georgetown and below Alexandria. Second week in May.

Brassica Sinapistrum, Boiss. CHARLOCK.

Seldom seen. June to August.

Brassica nigra, Koch. BLACK MUSTARD.

Virginia shore of the Potomac, below Chain Bridge. July.

† *Capsella Bursa-pastoris*, Moench. SHEPHERD'S PURSE.

March to June.

† *Lepidium Virginicum*, L. WILD PEPPERGRASS.

May.

† *Lepidium campestre*, L.

Often found far out in the woods, as if indigenous. May.

Thlaspi arvense, L. FIELD PENNYCRESS. MITHRIDATE-MUSTARD.

Formerly found near Jackson City, Va. (Dr. Vasey). Now exterminated. Professor Chickering finds this plant on Sugar Loaf Mountain, Maryland.

Raphanus sativus, L. RADISH.

Georgetown College Grounds, escaped. May.

CISTACEÆ.

ROCK-ROSE FAMILY.

† *Helianthemum Canadense*, Michx. FROST-WEED.

Found sparingly in Maryland. Second or third week in May.

Lechea minor, Walt. PIN-WEED.

End of May. Radical leaves usually gone at flowering time. They may be collected from December to April.

VIOLACEÆ.

VIOLET FAMILY.

† *Viola lanceolata*, L. LANCE-LEAVED VIOLET.

Meadow above Benning's Station. End of April.

Viola primulæfolia, L. PRIMROSE-LEAVED VIOLET.

End of April.

† *Viola cucullata*, Ait. COMMON BLUE VIOLET.

Last week in April.

† *Viola cucullata*, Ait., var. *palmata*, Gray. HAND-LEAF VIOLET.

Middle of May.

† *Viola cucullata*, Ait., var. *cordata*, Gray.

Not common. Leaves often cut-lobed near the base, usually villous. Third week in April.

† *Viola sagittata*, Ait. ARROW-LEAVED VIOLET.

Middle of April.

† *Viola pedata*, L. BIRD'S-FOOT VIOLET.

The type, or mono-colored form, rare. Third week in April.

Viola pedata, L., var. *bicolor*, Pursh.

Very common on dry gravelly hills. March and April.

† *Viola striata*, Ait. PALE VIOLET.

Little Falls, High Island, and islands above. There is a very large autumnal form of this plant. First half of May. Autumnal flowers collected September 10, 1876.

Viola pubescens, Ait. DOWNY YELLOW VIOLET.

First half of May.

† *Viola pubescens*, Ait., var. *eriocarpa*, Nutt.

Viola glabella, Nutt. [*V. pubescens*, Ait., var. *scabriuscula*, Torr. & Gray.]

High Island. First week in April.

† *Viola tricolor*, L., var. *arvensis*, Ging. WILD PANSY.

Apparently indigenous. April 1 to 20.

Ionidium concolor, Benth. & Hook. [*Solea concolor*, Ging.] GREEN VIOLET.

High Island and islands above. First week in May; fruit in July.

POLYGALACEÆ.

MILKWORT FAMILY.

Polygala incarnata, L. MILKWORT.

August or September.

† *Polygala sanguinea*, L.

July to October.

Polygala fastigiata, Nutt.

August to October.

***Polygala Curtissii*, Gray. CURTISS'S MILKWORT.**

Near Alexandria (A. H. Curtiss), (1869?). Not yet rediscovered. Forms that were supposed to be varieties of it are now referred to *P. fastigiata*, Nutt.

†*Polygala ambigua*, Nutt.

Rare. Only one specimen found; near Mount Pisgah Church, Maryland, October 12, 1879.

***Polygala polygama*, Walt.**

Sandy Landing, on both sides of the river. Third week in June.

†*Polygala Senega*, L. SENECA SNAKEROOT.

First half of June.

CARYOPHYLLACEÆ.**PINK FAMILY.****†*Dianthus Armeria*, L. DEPTFORD PINK.**

June. Autumnal flowers observed October 9, 1881.

†*Saponaria officinalis*, L. SOAPWORT. BOUNCING BET.

June and July.

†*Silene stellata*, Ait. STARRY CAMPION.

August.

***Silene nivea*, DC. SNOWY CAMPION.**

High Island. First week in June.

†*Silene Pennsylvanica*, Michx. WILD PINK.

April.

***Silene Armeria*, L. SWEET-WILLIAM CATCHFLY.**

Near Giesboro'. A few specimens found June 2, 1878. Locality exhausted.

†*Silene antirrhina*, L. SLEEPY CATCHFLY.

Fields. Middle of May.

†*Lychnis Githago*, Lam. CORN COCKLE.

Last week in May.

†*Cerastium viscosum*, L. [*C. vulgatum*, Gray's Manual.] MOUSE-EAR CHICKWEED.

A form with leaves 17^{mm} wide and 25^{mm} long, or nearly orbicular, was found by Professor Chickering at Cabin John Ruu in May, 1875. March to May.

†*Cerastium vulgatum*, L. [*C. viscosum*, Gray's Manual.] LARGER MOUSE-EAR CHICKWEED.

April.

†*Cerastium nutans*, Raf. CLAMMY CHICKWEED.

First week in May.

†*Cerastium oblongifolium*, Torr.

April.

†*Stellaria media*, Smith. COMMON CHICKWEED.

February to May.

†*Stellaria pubera*, Michx. GREAT CHICKWEED.

This plant flowers early in April, bearing large showy flowers on long peduncles from small plants with ovate leaves $2\frac{1}{2}$ cm to $3\frac{1}{4}$ cm long. These plants then go to seed and drop down, while new shoots from the same root spring up at the end of May, becoming much larger than the early ones, and bearing large obovate oblong leaves 8cm to 13cm long. These secondary plants are usually sterile, but frequently bear a few flowers at the summit; these are very small and on short peduncles, more or less concealed among the upper leaves.

†*Stellaria longifolia*, Muhl. LONG-LEAVED STITCHWORT.

May or June.

†*Arenaria serpyllifolia*, L. THYME-LEAVED SANDWORT.

Late in May.

Sagina apetala, L. PEARLWORT.

First Lock. Not seen since May 23, 1877, when it was discovered by the Rev. Thomas Morong. Locality now exhausted.

Sagina decumbens, Torr. & Gray. [*S. subulata*, Gray's Manual.]

Rare, around dwellings in the city. Latter part of May.

†*Lepigonum rubrum*, Fries. [*Spergularia rubra*, Presl, var. *campestris*, Gray.] SANDSPURREY.

Chiefly found in the streets of the city, with the habit of *Mollugo verticillata*. May or June.

ILLECEBRACEÆ.

WHITLOW-WORT FAMILY.

†*Anychia dichotoma*, Michx. FORKED CHICKWEED.

Dry woodlands; not common. July or August.

Anychia dichotoma, Michx., var. *capillacea*, Torr. SLENDER FORKED CHICKWEED.
July.*Paronychia dichotoma*, Nutt. WHITLOW-WORT.

Among the rocks at Little Falls. Middle of September to middle of October.

PORTULACACEÆ.

PURSLANE FAMILY.

†*Portulaca oleracea*, L. PURSLANE, or "PUSSLEY."
End of June.†*Claytonia Virginica*, L. SPRING BEAUTY.
End of February to middle of March.

HYPERICACEÆ.

ST. JOHN'S-WORT FAMILY.

†*Ascyrum Cruz-Andree*, L. ST. ANDREW'S CROSS.
July to September.†*Ascyrum stans*, Michx. ST. PETER'S-WORT.

Found in one spot two miles above Bladensburg, in a swamp, in fruit, October 20, 1878. Probably flowers in August.

†*Hypericum prolificum*, L. SHRUBBY ST. JOHN'S-WORT.

Middle of July.

†*Hypericum perforatum*, L. COMMON ST. JOHN'S-WORT.

First week in July. Runners best secured in November.

†*Hypericum corymbosum*, Muhl.

First half of July.

†*Hypericum mutilum*, L.

August to October.

†*Hypericum Canadense*, L.

August to October.

†*Hypericum Sarothra*, Michx. ORANGE-GRASS.

September.

†*Elodes Virginica*, Nutt. MARSH ST. JOHN'S-WORT.

July 15 to August 10.

MALVACEÆ.

MALLOW FAMILY.

†*Malva rotundifolia*, L. COMMON MALLOW.

May to October.

Malva sylvestris, L. HIGH MALLOW.

Georgetown, near end of Aqueduct Bridge. Early in July.

†*Sida spinosa*, L.

Last half of July.

†*Abutilon Avicennæ*, Gaertn. VELVET-LEAF

August.

†*Hibiscus Moscheutos*, L. SWAMP ROSE-MALLOW.

Late in July.

†*Hibiscus militaris*, Cav. HALBERD-LEAVED ROSE-MALLOW.

End of July or in August.

Hibiscus Trionum, L. BLADDER-KETMIA. FLOWER-OF-AN-HOOR.

Rare. End of August.

TILIACEÆ.

LINDEN FAMILY.

†*Tilia Americana*, L. AMERICAN LINDEN. BASSWOOD.

Usually growing close to the water.

LINACEÆ.

FLAX FAMILY.

†*Linum Virginianum*, L. WILD FLAX.

June 10 to July 10. There are two well-marked forms of this species, the one growing in open ground, the other in shady woods. The first of these forms bears many thickly-crowded, erect, appressed, linear leaves, 2^{mm} to 3^{mm} wide; the second bears few spreading, lanceolate leaves 4^{mm} to 6^{mm} in width. In the former the stem is always erect and rigid, while in the latter it usually bends over and is weak and flaccid. These two forms are very noticeably distinct in aspect.

***Linum striatum*, Walt.**

Reform School. Falls Church. Third week in July.

† ***Linum usitatissimum*, L. COMMON FLAX.**

Waste places in the city. August.

GERANIACEÆ.**GERANIUM FAMILY.**† ***Geranium maculatum*, L. SPOTTED CRANESBILL.**

April or May.

† ***Geranium Carolinianum*, L. CAROLINA CRANESBILL.**

May.

***Geranium columbinum*, L. LONG-STALKED CRANESBILL.**

In one small spot on Hunting Creek, also near Rosslyn on the Falls Church Road (Professor Chickering). Last half of May.

***Geranium pusillum*, L. SMALL-FLOWERED CRANESBILL.**

Main street of Bladensburg. Latter part of May.

***Erodium cicutarium*, L'Her. STORKSBILL.**

Found only near the canal, at the foot of Eighteenth street; apparently introduced and scarcely able to maintain its hold against opposition. March 20 to June.

† ***Oxalis violacea*, L. VIOLET WOOD-SORREL.**

Occasionally found with a large conical tap-root, which, however, is clear, transparent, and watery, and shrinks away almost entirely on drying. This tap-root proceeds from the bottom of the bulb. It terminates in a few small fibers and throws off other and finer lateral ones. The plant has not been seen to bear fruit here. Last half of May.

† ***Oxalis corniculata*, L., var. *stricta*, Sav. [*O. stricta*, L.] YELLOW WOOD-SORREL.**

April to June.

† ***Impatiens pallida*, Nutt. PALE TOUCH-ME-NOT.**

June to September.

† ***Impatiens fulva*, Nutt. SPOTTED TOUCH-ME-NOT.**

June to September.

RUTACEÆ.**RUE FAMILY.*****Xanthoxylum Americanum*, Mill. PRICKLY ASH. TOOTHACHE-TREE.**

Pierce's Mill. Probably originally cultivated.

† ***Ptelea trifoliata*, L. HOP-TREE. SHRUBBY TREFOIL.**

Last half of May.

ILICINEÆ.**HOLLY FAMILY.**† ***Ilex opaca*, Ait. AMERICAN HOLLY.**

Usually small, but in one locality, on Paint Branch, trees were found measuring one meter in girth some distance above the base. End of May.

Ilex decidua, Walt.

High Island. Great Falls. Third week in May; fruit ripe in September.

† **Ilex verticillata**, Gray. WINTERBERRY.

Middle of June.

† **Ilex lævigata**, Gray.

Limb of the corolla in the staminate flowers reflexed. Two weeks earlier flowering than the last. First week in June.

CELASTRACEÆ.

STAFF-TREE FAMILY.

Euonymus atropurpureus, Jacq. WAAHOO. BURNING BUSH.

Second week in June.

† **Euonymus Americanus**, L. STRAWBERRY BUSH.

First week in June; fruit, last of September.

Euonymus Americanus, L., var. *obovatus*, Torr. & Gray.

A mere form of the last. Third week in May.

† **Celastrus scandens**, L. WAX-WORK. CLIMBING BITTERSWEET.

Third week in May; fruit opens in November.

RHAMNACEÆ.

BUCKTHORN FAMILY.

† **Ceanothus Americanus**, L. RED-ROOT. NEW JERSEY TEA.

Third week in June.

Ceanothus ovatus, Desf. [*Ceanothus ovalis*, Bigelow.]

Rocks at Little Falls. Middle of May.

VITACEÆ.

VINE FAMILY.

† **Vitis Labrusca**, L. NORTHERN FOX-GRAPE.

First week in June; fruit in September.

Vitis æstivalis, Michx. SUMMER GRAPE.

A form with very deeply lobed leaves is frequently met with. End of May; fruit, middle of September.

† **Vitis cordifolia**, Lam. WINTER GRAPE. FROST GRAPE.

Last week in May; fruit in November.

† **Vitis riparia**, Michx.

Second or third week in May, and about ten days earlier than the last; fruit ripe in November.

Vitis vulpina, L. SOUTHERN FOX-GRAPE.

First found very sparingly on rocks immediately above Sandy Landing, Md., May 22, 1881, then in flower; and again later (June 4) with young fruit, on the Flats a short distance below the Chain Bridge.

† **Ampelopsis quinquefolia**, Michx. VIRGINIAN CREEPER. AMERICAN WOODBINE.

End of May.

SAPINDACEÆ.

SOAPBERRY FAMILY.

Acer saccharinum, Wang. SUGAR-MAPLE. HARD MAPLE.

Early in May. Only one certainly indigenous tree known; this is located on the fourth of the islands above High Island (Sugar-Maple Island); it has borne nothing but leaves since its discovery in 1876. Qy.: Is this for want of cross-fertilization?

Acer dasycarpum, Ehrh. SILVER MAPLE.

Less common than *A. rubrum* in the wild state. Generally planted in the streets of the city, where it often flowers in January and tends to become wholly dioecious. January 15 to March.

† **Acer rubrum**, L. RED MAPLE. SWAMP-MAPLE.

Last of February to first of April.

† **Negundo aceroides**, Moench. BOX-ELDER.

Third week in April.

Staphylea trifolia, L. AMERICAN BLADDER-NUT.

First week in May.

ANACARDIACEÆ.

CASHEW FAMILY.

Rhus typhina, L. STAGHORN SUMAC.

June.

† **Rhus glabra**, L. SMOOTH SUMAC.

July.

† **Rhus copallina**, L. DWARF SUMAC.

Here becoming large, 8^{cm} in diameter and 5^m to 6^m high. Last half of July.

† **Rhus venenata**, DC. POISON SUMAC.

Common in swamps. First half of July. Found also occasionally growing on dry ground, where it flowers at the end of May.

† **Rhus Toxicodendron**, L. POISON IVY.

Everywhere abundant. Pith on small vines, when clinging tightly to a support, always near the outer side. (See *American Naturalist*, April, 1876, p. 232.) Last half of May.

Rhus aromatica, Ait. FRAGRANT SUMAC.

Broadwater. A single bush discovered by Mr. E. O. Graves. It bears pistillate flowers each year, which never mature because not fertilized. Last half of April.

LEGUMINOSÆ.

PULSE FAMILY.

† **Baptisia tinctoria**, R. Br. WILD INDIGO.

Third week in June.

† **Baptisia australis**, R. Br. BLUE FALSE INDIGO.

Rocky river bottoms at Little Falls. Last of May or early in June.

† *Crotalaria sagittalis*, L. RATTLE-BOX.

Last half of August.

† *Lupinus perennis*, L. WILD LUPINE.

Last of April or first of May.

Cytisus scoparius, Link. SCOTCH BROOM.

Roadside, near the northern corner of the District. Last of May or first of June.

Medicago sativa, L. LUCERNE. ALFALFA.

Sparingly escaped.

Medicago lupulina, L. BLACK MEDICK. NONESUCH.

May.

Melilotus officinalis, Willd. YELLOW MELILOT.

Streets of Washington. Rare. First half of June.

† *Melilotus alba*, Lam. WHITE MELILOT.

June.

† *Trifolium arvense*, L. RABBIT-FOOT CLOVER.

Latter part of June.

† *Trifolium pratense*, L. RED CLOVER.

June.

† *Trifolium reflexum*, L. BUFFALO-CLOVER.

High Island. End of May. Rare.

† *Trifolium repens*, L. WHITE CLOVER.

May or June.

Trifolium agrarium, L. HOP-CLOVER.

June to July.

† *Trifolium procumbens*, L. LOW HOP-CLOVER.

May to June.

† *Tephrosia Virginiana*, Pers. HOARY PEA. GOAT'S RUE.

Second week in June.

† *Robinia Pseudacacia*, L. LOCUST.

Third week in May.

† *Astragalus Canadensis*, L. MILK-VETCH.

Potomac Shore, Va.; also on High Island. End of June.

† *Stylosanthes elatior*, Swartz. PENCIL-FLOWER.

August.

† *Desmodium nudiflorum*, DC. TICK-TREFOIL.

Last of July.

† *Desmodium acuminatum*, DC.

August or first of September.

Desmodium pauciflorum, DC.

Rare. Last of August or first of September.

†*Desmodium rotundifolium*, DC.

September.

Desmodium rotundifolium, DC., var. *glabratum*, Gray.

Near Great Falls (Professor Chickering).

Desmodium canescens, DC.

End of August.

Desmodium cuspidatum, Hook.

Northwest Branch (Professor Chickering, 1878).

Desmodium lævigatum, DC.

August or September.

†*Desmodium viridiflorum*, Beck.

Reform School. September.

Desmodium Dillenii, Darl.

August or September.

†*Desmodium paniculatum*, DC.

Last of July or first of August.

Desmodium rigidum, DC.

September.

†*Desmodium ciliare*, DC.

Reform School. September.

†*Desmodium Marylandicum*, Boott.

Reform School. September.

†*Lespedeza repens*, Bart. BUSH-CLOVER.

The two forms are well marked here, not only by the difference of pubescence, but by the greater abundance of flowers on the downy variety (*L. procumbens*, Michx.). Latter part of August or early in September.

Lespedeza reticulata, Pers., var. *angustifolia*, Maxim. [*Lespedeza violacea*, Pers., var. *angustifolia*, Gray.]

September.

†*Lespedeza violacea*, Pers.

September.

Lespedeza Stuvei, Nutt.

Reform School. September.

†*Lespedeza hirta*, Ell.

September.

Lespedeza capitata, Michx.

September.

Vicia sativa, L. VETCH. TARE.

Last half of May.

Vicia tetrasperma, Loisel.

Insane Asylum. Early in June.

***Vicia hirsuta*, Koch.**

Kendall Green (Professor Chickering, 1878).

***Vicia Caroliniana*, Walt.**

April.

† ***Lathyrus paluster*, L. VETCHLING. EVERLASTING PEA.**

Eastern Branch Marsh. First half of July.

† ***Lathyrus venosus*, Muhl.**

Rocky places along the Potomac. May.

† ***Clitoria Mariana*, L. BUTTERFLY-PEA.**

Rock Creek; Terra Cotta. Rare, and seldom fruiting. Second week in July.

† ***Amphicarpæa monoica*, Ell. HOG PEANUT.**

September.

† ***Apios tuberosa*, Moench. GROUND-NUT.**

Last of July or first of August.

† ***Galactia mollis*, Michx. MILK-PEA.**

August.

† ***Phaseolus perennis*, Walt. WILD BEAN.**

Great Falls (Professor Chickering). Locks above Chain Bridge (Dr. Vasey).

† ***Phaseolus helvolus*, L.**

August.

***Rhynchosia tomentosa*, Torr. & Gray.**

A single specimen, out of flower, found September 14, 1879, near Bladensburg.

† ***Gleditschia triacanthos*, L. HONEY-LOCUST.**

End of May; fruit, July or August.

† ***Cassia Marylandica*, L. WILD SENNA.**

End of May.

† ***Cassia Chamæcrista*, L. SENSITIVE PEA.**

August.

† ***Cassia nictitans*, L. SMALL-FLOWERED WILD SENSITIVE PEA.**

August.

† ***Cercis Canadensis*, L. RED-BUD. JUDAS-TREE.**

April.

ROSACEÆ.**ROSE FAMILY.*****Prunus Persica* (Benth. & Hook). PEACH.**

Escaped and found wild remote from cultivation. May.

***Prunus Armeniaca*, L. APRICOT.**

Found in several places growing without cultivation.

***Prunus Americana*, Marshall. WILD PLUM**

Last half of April.

Prunus Chicasa, Michx. CHICKASAW PLUM.

Fort Mahan. Third week in April.

Prunus spinosa, L. SLOE. BLACK THORN.

Roadside above Benning's. Third week in April.

†**Prunus Virginiana**, L. CHOKE-CHERRY.

Opposite Alexandria (Professor Seaman). Hunting Creek (Dr. Vasey, 1877).

Prunus serotina, Ehrh. BLACK CHERRY.

Middle of May.

†**Spiræa salicifolia**, L. MEADOW-SWEET.

Very rare; not seen since 1874.

Spiræa Aruncus, L. GOAT'S-BEARD.

First half of June.

†**Neillia opulifolia**, Benth. & Hook. [*Spiræa opulifolia*, L.] NINE-BARK.

Last week in May.

†**Gillenia trifoliata**, Moench. INDIAN PHYSIC. AMERICAN IPECAC.

End of May.

†**Rubus occidentalis**, L. BLACK RASPBERRY.

Last of May or first of June; fruit ripe before the end of June.

†**Rubus villosus**, Ait. BLACKBERRY.

A variety was found May 17, 1874, which is "between *R. villosus* and *R. trivialis*" (Gray). It has single flowers on long peduncles. Last half of May; fruit in July; autumnal flowers September 22 and October 27, 1878.

†**Rubus Canadensis**, L. DEWBERRY.

Middle of May; fruit, third week in July.

Rubus hispida, L. RUNNING SWAMP-BLACKBERRY.

Second week in June.

Rubus cuneifolius, Pursh. SAND-BLACKBERRY.

Insane Asylum. First of June.

†**Geum album**, Gmel. AVENS. HERB BENNETT.

July.

†**Geum Virginianum**, L.

Hunting Creek. July.

Geum strictum, Ait.

Hunting Creek. Last of May or first of June.

Geum vernum, Torr. & Gray. SPRING AVENS.

Georgetown College Grounds. End of April.

†**Fragaria Virginiana**, Duchesne. STRAWBERRY.

May; wild fruit not ripe till June.

Fragaria Indica, Andr. MOCK STRAWBERRY.

Mount Vernon; Georgetown College Grounds (Chickering). Last half of May; fruit ripe early in June.

†*Potentilla Norvegica*, L.

August or September.

†*Potentilla Canadensis*, L. CINQUE-FOIL. FIVE-FINGER.

April.

†*Potentilla Canadensis*, L., var. *simplex*. Torr. & Gray.

May.

Alchemilla arvensis, Scop. LADY'S MANTLE.

Only once found, on Meridian Hill, by Dr. Vasey and Professor Chickering. Long since obliterated.

†*Agrimonia Eupatoria*, L. COMMON AGRIMONY.

July or August.

†*Agrimonia parviflora*, Hook. SMALL-FLOWERED AGRIMONY.

August or September.

†*Poterium Canadense*, Benth. & Hook. CANADIAN BURNET.

Third week in September.

Poterium Saugisorba, L. BURNET.

Odonton, Md., May 30, 1877. Should be looked for nearer.

Rosa setigera, Michx. CLIMBING ROSE.

Escaped in some places. June.

Rosa Carolina, L. SWAMP ROSE.

June.

Rosa lucida, Ehrh. DWARF WILD ROSE.

End of May.

†*Rosa rubiginosa*, L. SWEET-BRIER.

June.

Rosa micrantha, Smith. SMALLER-FLOWERED SWEET-BRIER.

June.

Rosa canina, L. DOG-ROSE.

High Island.

†*Pirus coronaria*, L. AMERICAN CRAB-APPLE.

Northwest Branch (Professor Chickering); a few trees only. End of April or first of May.

†*Pirus arbutifolia*, L. CHOKE-BERRY.

Two forms, a high and a low bush, the former of which flowers two weeks later than the latter, grows in very moist swamps, and bears much smaller berries, which persist throughout the winter. End of April (low-bush) to middle of May (high-bush).

†*Pirus arbutifolia*, L., var. *melanocarpa*, Hook.

North of Bladensburg. Fruit collected July 20, 1879.

Cratægus cordata, Ait. WASHINGTON THORN.

Rock Creek Church Road near Soldiers' Home, also Bladensburg. Not common. Second week in June; fruit in October.

Cratægus Oxyacantha, L. ENGLISH HAWTHORN.

Near Alexandria. Last of April or first of May; fruit in October.

†**Cratægus coccinea**, L. SCARLET-FRUITED THORN.

End of May.

Cratægus Crus-galli, L. COCKSPUR THORN.

Latter part of May.

Cratægus parvifolia, Ait. DWARF THORN.

High Island (a single bush), also Great Falls. Third week in May.

†**Amelanchier Canadensis**, Torr. & Gray. JUNE-BERRY. SERVICE-BERRY. SHAD-BUSH.

April; fruit, middle of June.

Amelanchier Canadensis, var. *oblongifolia*, Torr. & Gray.

A greatly reduced form of this is common along ditches, flowering at the height of $\frac{1}{2}$ meter. April.

SAXIFRAGACEÆ.

SAXIFRAGE FAMILY.

†**Saxifraga Virginensis**, Michx. EARLY WHITE SAXIFRAGE.

The flowers open from among the rosettes of leaves before the stem is apparent and continue centrifugally as the stem and branches emerge. Last half of March or early in April.

†**Mitella diphylla**, L. MITRE-WORT. BISHOP'S CAP.

Woodley; rare. First half of May.

†**Heuchera Americana**, L. ALUM-ROOT.

End of May or beginning of June.

Chrysosplenium Americanum, Schwein. GOLDEN SAXIFRAGE.

Rare, in rocky cataracts. February to April.

†**Hydrangea arborescens**, L. WILD HYDRANGEA.

Enlarged petals occasionally occur in the outer row of flowers. Late in June.

†**Philadelphus inodorus**, L. MOCK ORANGE. SYRINGA.

Scarcely found in a wild state. June.

†**Itea Virginica**, L.

Rare. Eastern Branch; Four Mile Run; Hunting Creek. Third week in May.

Ribes rotundifolium, Michx. GOOSEBERRY.

Soldiers' Home, escaped; also at Mt. Vernon (Professor Chickering). Third week in April; fruit ripe in July.

Ribes rubrum, L. RED CURRANT.

Rare. Not yet collected in fruit. Last of April or first of May.

CRASSULACEÆ.

ORPINE FAMILY.

†**Sedum ternatum**, Michx. STONE-CROP. ORPINE.

Last half of May.

***Sedum telephioides*, Michx. WILD LIVE-FOR-EVER.**

Rocks at Broadwater. September.

† *Penthorum sedoides*, L. DITCH STONE-CROP.

September.

DROSERACEÆ.**SUNDEW FAMILY.****† *Drosera rotundifolia*, L. SUNDEW.**

Holmead Swamp; rare. End of July.

HAMAMELACEÆ.**WITCH-HAZEL FAMILY.****† *Hamamelis Virginiana*, L. WITCH-HAZEL.**

October.

† *Liquidambar Styraciflua*, L. SWEET-GUM.

Middle of May.

HALORAGÆÆ**WATER-MILFOIL FAMILY.*****Myriophyllum spicatum*, L. WATER-MILFOIL.**

Found in former years below Alexandria by Mr. Anton Zumbrook. Probably still there.

***Proserpinaca palustris*, L. MERMAID-WEED.**

June or July.

† *Callitriche verna*, L. WATER-STARWORT.

April or May.

MELASTOMACEÆ.**MELASTOMA FAMILY.****† *Rhexia Virginica*, L. MEADOW-BEAUTY. DEER-GRASS.**

Second half of July.

LYTHRACEÆ.**LOOSESTRIFE FAMILY.****† *Ammannia humilis*, Michx. TOOTH-CUP.**

Flats near Eads' Mill. Middle of August.

† *Cuphea viscosissima*, Jacq. CLANMY CUPHEA. BLUE WAX-WEED.

August.

† *Lythrum alatum*, Pursh. LOOSESTRIFE.

Flats, Outlet Lock to High Island. August.

† *Nesæa verticillata*, H. B. K. SWAMP LOOSESTRIFE.

Flats above Outlet Lock.

ONAGRACEÆ.**EVENING PRIMROSE FAMILY.****† *Epilobium coloratum*, Muhl. WILLOW-HERB.**

August or September.

†*Jussiaea decurrens*, DC.

Hunting Creek; Custis Spring. Middle of August to end of September.

†*Ludwigia alternifolia*, L. FALSE LOOSESTRIFE.

Last of August.

†*Ludwigia hirtella*, Raf.

Holmead Swamp; rare. Middle of July to August.

†*Ludwigia palustris*, Ell. WATER PURSLANE.

Early in July. Large floating leaves form in running water in October, and submersed plants in still water in early spring.

†*Oenothera biennis*, L. EVENING PRIMROSE.

September or October.

†*Oenothera sinuata*, L.

Railroad, near Benning's Station (Dr. Vasey, 1878).

†*Oenothera fruticosa*, L. SUNDROPS.

June.

Oenothera fruticosa, L., var. *linearis*, Watson. [*Oenothera riparia*, Nutt.]

Middle of May to middle of June.

Gaura biennis, L.

Bearing large rosettes of red-spotted leaves in autumn. August to October.

†*Circæa lutetiana*, L. ENCHANTER'S NIGHTSHADE.

Last half of June.

PASSIFLORACEÆ.

PASSION-FLOWER FAMILY.

†*Passiflora incarnata*, L. PASSION-FLOWER.

Kendall Green (Professor Chickering).

†*Passiflora lutea*, L.

Last of July or first of August; fruit ripe in October.

CUCURBITACEÆ.

GOURD FAMILY.

†*Sicyos angulatus*, L. STAR-CUCUMBER.

August.

CACTACEÆ.

CACTUS FAMILY.

†*Opuntia vulgaris*, Haworth. CACTUS. PRICKLY PEAR. INDIAN FIG.

Great Falls. Last week in June.

FICOIDEÆ.

†*Mollugo verticillata*, L. CARPET-WEED.

July or August.

UMBELLIFERÆ.

PARSLEY FAMILY.

Hydrocotyle ranunculoides, L. WATER PENNYWORT.

Springy place above the Outlet Lock. May to July.

†**Hydrocotyle Americana**, L.

July.

†**Eryngium Virginianum**, Lam. ERYNGO. BUTTON SNAKEROOT.

September.

Sanicula Canadensis, L. SANICLE. BLACK SNAKEROOT.

June.

†**Sanicula Marylandica**, L.

Woodley Park. June.

Erigenia bulbosa, Nutt. HARBINGER-OF-SPRING.

High Island. Last of March or first of April.

†**Cicuta maculata**, L. SPOTTED COWBANE. MUSQUASH-ROOT. WATER-HEMLOCK.

June to July.

†**Sium cicutæfolium**, Gmel. [*Sium lineare*, Michx.] WATER-PARSNIP.

September.

†**Pimpinella integerrima**, Benth. & Hook. [*Zizia integerrima*, DC.]

May to June.

†**Cryptotænia Canadensis**, DC. HONEWORT.

June.

Osmorrhiza longistylis, DC. SWEET CICELY.

Last half of May.

Osmorrhiza brevistylis, DC.

High Island. Last week in May.

†**Chærophyllum procumbens**, Crantz. CHERVIL.

. First half of May.

Discopleura capillacea, DC. MOCK BISHOP-WEED.

Custis Spring. Third week in August.

†**Thaspium barbinode**, Nutt. MEADOW-PARSNIP.

June to August.

†**Thaspium aureum**, Nutt.

High Island. April; fruit in June or July.

†**Thaspium trifoliatum**, Gray.

April; fruit in August.

Archangelica hirsuta, Torr. & Gray.

July; fruit in September.

Pastinaca sativa, L. PARSNIP.

Georgetown. June.

Archemora rigida, DC. COWBANE.

September.

Heracleum lanatum, Michx. COW-PARSNIP.

High Island; scarce. Last of May or first of June.

† **Daucus Carota**, L. CARROT.

Thoroughly naturalized. For certain peculiarities in the central flowers of the umbels of this plant, see *Field and Forest* for September, 1877, p. 53. June to September.

ARALIACEÆ.

GINSENG FAMILY.

Aralia spinosa, L. HERCULES' CLUB.

Woodley, in one small spot; around Pierce's Mill, probably planted; near the Sligo Creek; also along the Falls Church Road, near Hall's Hill (Professor Chickering). Last of August or first of September.

† **Aralia racemosa**, L. SPIKENARD.

Rather rare. July.

Aralia nudicaulis, L. WILD SARSAPARILLA.

Last half of May.

† **Aralia trifolia**, Deesne. DWARF GINSENG.

Deep shaded ravines, rare. First half of May.

CORNACEÆ.

DOGWOOD FAMILY.

† **Cornus florida**, L. FLOWERING DOGWOOD.

Middle of April to middle of May.

† **Cornus sericea**, L. SILKY CORNEL. KINNIKINNICK.

Middle to end of June.

Cornus stolonifera, Michx. RED-OSIER DOGWOOD.

June.

Cornus alternifolia, L. ALTERNATE-LEAVED CORNEL.

Third week in May.

† **Nyssa multiflora**, Wang. SOUR GUM. TUPELO. PEPPERIDGE.

Found flowering (♂) while yet a mere shrub 1^m in height. Last of May.

CAPRIFOLIACEÆ.

HONEYSUCKLE FAMILY.

† **Sambucus Canadensis**, L. ELDER.

Second or third week in June; fruit in July.

† **Viburnum prunifolium**, L. BLACK HAW.

First week in May; fruit in October.

† **Viburnum nudum**, L. WITHE-ROD.

Last half of May; fruit in September.

† *Viburnum dentatum*, L. ARROW-WOOD.

Last half of May; fruit in September.

Viburnum pubescens, Pursh.

Great Falls and below, where it is abundant, but had been overlooked until discovered by Prof. J. H. Comstock, May 22, 1881, at which time it was in fine flowering condition.

† *Viburnum acerifolium*, L. MAPLE-LEAVED ARROW-WOOD. DOCKMACKIE.

Latter part of May; fruit in September.

† *Triosteum perfoliatum*, L. HORSE-GENTIAN. FEVERWORT.

First half of June.

Triosteum angustifolium, L. SMALLER HORSE-GENTIAN.

Coreoran's Woods; Great Falls; High Island. First week in May.

Symphoricarpos racemosus, Michx. SNOWBERRY.

End of May or first of June; fruit last of July.

† *Symphoricarpos vulgaris*, Michx. CORAL-BERRY. INDIAN CURRANT.

Latter part of August; fruit, December and through the winter.

Lonicera sempervirens, Ait. TRUMPET HONEYSUCKLE.

The yellow-flowered variety is common. First week in June; fruit, early in July.

Lonicera Japonica, Andr. [*L. confusa*, DC.] JAPANESE HONEYSUCKLE.

Well established in many remote places. In a wild state the lower leaves are often found deeply lobed or lyrate. Usually flowers twice, in May and in September or October.

RUBIACEÆ.

MADDER FAMILY.

† *Cephalanthus occidentalis*, L. BUTTON-BUSH.

First week in July.

† *Houstonia purpurea*, L. VENUS'S PRIDE.

May 10 to June 10. Autumnal flowers, October 13, 1878.

† *Houstonia purpurea*, L., var. *longifolia*, Gray.

Rocky places; appears to be a good species. June. Autumnal flowers, September 12, 1880.

† *Houstonia cærulea*, L. BLUETS.

March and April. Autumnal flowers, September 7, 1879.

† *Mitchella repens*, L. PARTRIDGE-BERRY.

First half of June; fruit, November and persistent throughout the year.

† *Diodia teres*, Walt. BUTTON-WEED.

July.

Galium Aparine, L. CLEAVERS. GOOSE-GRASS.

May.

Galium asprellum Michx. ROUGH BEDSTRAW.

Cameron Run. Last of September or first of October.

Galium concinnum, Torr. & Gray. BEDSTRAW

First half of June.

† **Galium trifidum**, L. SMALL BEDSTRAW.

Last of May.

† **Galium triflorum**, Michx. SWEET-SCENTED BEDSTRAW.

July.

† **Galium pilosum**, Ait.

Last of May and first half of June.

† **Galium circæzans**, Michx. WILD LIQUORICE.

Last of May and first half of June.

VALERIANACEÆ.

VALERIAN FAMILY.

Valeriana pauciflora, Michx. VALERIAN.

High Island; Larkspur Island. Third week in May.

Fedia olitoria, Vahl. [*Valerianella*, Benth. & Hook., Gen. Pl.] CORN-SALAD. LAMB-LETTUCE.

Insane Asylum; Green Spring Schuetzen Park. Last of April or first half of May.

Fedia Fagopyrum, Torr. & Gray.

High Island (Professor Chickering).

† **Fedia radiata**, Michx.

Near the Distributing Reservoir; rare. Middle of May.

DIPSACEÆ.

TEASEL FAMILY.

† **Dipsacus sylvestris**, Mill. WILD TEASEL.

Along the Potomac, on the flats from the Outlet Lock to High Island. Last half of July.

COMPOSITÆ.

COMPOSITE FAMILY.

† **Vernonia Noveboracensis**, Willd. IRON-WEED. FLAT-TOP.

Heads very variable in size. July to September.

† **Elephantopus Carolinianus**, Willd. ELEPHANT'S-FOOT.

August.

† **Eupatorium purpureum**, L. JOE-PYE WEED. TRUMPET-WEED.

A form occurs with nearly white flowers, green stems, thin leaves, and blackish joints to the stem. August, September.

† **Eupatorium hyssopifolium**, L.

Not common. Roots thickening almost into tubers. Last of August to October.

† **Eupatorium album**, L.

Varies in the width and thickness of the leaves. Late in July and through August.

†*Eupatorium teucrifolium*, Willd.

September.

†*Eupatorium rotundifolium*, L.

August and September.

†*Eupatorium pubescens*, Muhl.

Forms occur uniting this species and the preceding. September.

†*Eupatorium sessilifolium*, L. UPLAND BONESET.

July to September.

Eupatorium sessilifolium × *pubescens*, Gray.

"Between *sessilifolium* and *pubescens*" (Professor Asa Gray). Above Pierce's Mill. September 30, 1877.

†*Eupatorium perfoliatum*, L. THOROUGH WORT. BONESET.

A specimen with all the leaves in whorls of three was found by Prof. M. H. Doolittle, October 26, 1879, near the Receiving Reservoir. August to October.

†*Eupatorium ageratoides*, L. WHITE SNAKEROOT.

August, September.

†*Eupatorium aromaticum*, L.

September.

†*Conoclinium coelestinum*, DC. [*Eupatorium*, Benth. & Hook., Gen. Pl.] MIST-FLOWER.

August to October.

†*Mikania scandens*, L. CLIMBING HEMP-WEED. CLIMBING BONESET.

Marshes; Four Mile Run; Eastern Branch, &c. September.

†*Kuhnia eupatorioides*, L. FALSE BONESET.

Woodley Park; Terra Cotta. Root very large and deep. September.

Liatris scariosa, Willd. BUTTON SNAKEROOT. BLUE BLAZING STAR.

Near Fort Bennett, Va. Only a single specimen found, October 24, 1873, in an advanced state.

Liatris graminifolia, Willd. GAY FEATHER.

September.

Liatris graminifolia, Willd., var. *dubia*, Gray.

Distinction close if it really exists. September.

†*Chrysopsis Mariana*, Nutt. GOLDEN ASTER. MARYLAND GOLDEN STAR.

August, September.

†*Solidago bicolor*, L. GOLDEN ROD.

September, October.

Solidago bicolor, L., var. *concolor*, Gray.

September, October.

†*Solidago latifolia*, L.

August to October.

†*Solidago cæsia*, L.

September to October.

***Solidago stricta*, Ait.**

Terra Cotta Swamp. Middle to end of September.

***Solidago speciosa*, Nutt., var. *angustata*, Gray.**

A very distinct form with much the habit of *S. bicolor*, but larger, the stem smooth below, as also the ample radical leaves; flowers yellow and showy. Although Professor Gray has referred it to the above species, still it bears no resemblance to forms from the West (Arkansas) which have also been so referred by the same authority. It will probably be erected into a species. September, October.

***Solidago Virga-aurea*, L., var. *humilis*, Gray.**

Rocks on the Virginia side of the Potomac, below Chain Bridge. Large, often a meter in height. August, September.

***Solidago rigida*, L.**

Woodley Park. A single specimen found, September 22, 1878.

***Solidago elliptica*, Ait.**

This species, which has now been found in several places (Reform School, Terra Cotta Swamp, near Bladensburg, &c.), and has been distributed thus far under the name of *S. neglecta*, Torr. & Gray, has, upon more careful examination, been now referred to *S. elliptica*, though exhibiting numerous variances from the descriptions given of that plant. September.

***Solidago arguta*, Ait.**

The earliest flowering species of our Golden Rods. Middle of July to August.

†*Solidago altissima*, L.

A rough and a smooth form. August.

***Solidago ulmifolia*, Muhl. ELM-LEAVED GOLDEN ROD.**

August, September.

***Solidago odora*, Ait. SWEET GOLDEN ROD.**

Late in July and through August.

***Solidago nemoralis*, Ait.**

Middle of August to October.

***Solidago rupestris*, Raf.**

Virginia shore of Potomac, below Little Falls. August 1 to middle of September.

***Solidago Canadensis*, L.**

September, October.

***Solidago gigantea*, Ait.**

Virginia shore of Potomac, below Little Falls; also near Bladensburg. September to middle of October.

†*Solidago lanceolata*, L.

Late in September or in October.

†*Sericocarpus solidagineus*, Nees. WHITE-TOPPED ASTER.

Middle to end of June.

†*Sericocarpus conyzoides*, Nees.

Last of June or first of July.

† *Aster corymbosus*, Ait.

Middle of August to last of September.

Aster macrophyllus, L.

The form found here differs from the northern form in the size of the leaf and of the heads and in the number of flowers in the heads, and seems to be intermediate between that and *A. corymbosus*. The large radical leaves, 12^{cm} to 14^{cm} wide, spring up in thick patches in May. Last of July or first of August.

Aster concolor, L.

September.

† *Aster patens*, Ait. SPREADING ASTER.

September.

Aster lævis, L.

Some remarkable forms of this species occur. It has only been found in Woodley Park. September.

Aster lævis, L., var. *cyaneus*, Gray.

September.

† *Aster undulatus*, L.

September.

Aster cordifolius, L.

Late in September and until after frost.

† *Aster ericoides*, L.

September or October. A remarkable diminutive form, with linear appressed leaves thickly covering the simple stems, 12^{cm} to 15^{cm} high, was found October 5, 1879, on rocks below Great Falls.

Aster dumosus, L.

Not common. September.

Aster Tradescanti, L.

September, October.

† *Aster miser*, L.

Late in September or in October; varying immensely.

Aster simplex, Willd.

September or October.

Aster tenuifolius, L.

Narrow-leaved forms of the preceding agree well with authentic specimens of *A. tenuifolius*, though they can scarcely be distinct. September, October.

Aster carneus, Nees.

Cameron Run; Potomac above Rosslyn; rare. October.

Aster æstivus, Ait.

Holmead Swamp; Terra Cotta Swamp. September.

† *Aster puniceus*, L.

September, October.

Aster puniceus, L., var. *vimineus*, Gray.

Piney Branch. September, October.

Aster prenanthoides, Muhl.

Cameron Run; Great Falls. Last of September or early in October.

Aster oblongifolius, Nutt.

Virginia side of the Potomac below the Chain Bridge, also at Great Falls; on rocks. Last half of September and through October.

† **Aster Novæ-Angliæ**, L.

Bluffs of the Potomac (rare), and sparingly in a few other localities. October.

† **Diplopappus linariifolius**, Hook. [*Aster*, Benth. & Hook., Gen. Pl.] DOUBLE-BRISTLED ASTER.

September.

Diplopappus umbellatus, Torr. & Gray.

Reform School. September.

Diplopappus cornifolius, Darl.

July to September.

† **Erigeron Canadensis**, L. HORSE-WEED. BUTTER-WEED.

July, August.

Erigeron bellidifolius, Muhl. ROBIN'S PLANTAIN. POOR ROBIN'S PLANTAIN.

Middle of April to end of May.

† **Erigeron Philadelphicus**, L. FLEABANE.

Last week in April to middle of May.

† **Erigeron annuus**, Pers. DAISY FLEABANE. SWEET SCABIOUS.

June to October. (Found as late as October 10, 1873.)

Erigeron strigosus, Muhl. DAISY FLEABANE.

June to August.

Baccharis halimifolia, L. GROUNDSEL-TREE.

One large branching plant found by Dr. Vasey and Professor Chickering on the Aqueduct Road above Cabin John Run, September 17, 1878.

† **Filago Germanica**, L. HERBA IMPIA.

Near Occoquan Falls, July 9, 1876; rare. Not yet found strictly within our limits.

† **Antennaria plantaginifolia**, Hook. PLANTAIN-LEAVED EVERLASTING. MOUSE-EAR EVERLASTING.

Female plants much larger than the male, often half a meter in height, and both varying widely. Last of March to June.

† **Gnaphalium polycephalum**, Michx. COMMON EVERLASTING.

April to August.

† **Gnaphalium uliginosum**, L. LOW CUDWEED.

Rare. Near Le Droit Park, July 20, 1873. Wet meadow, sources of Piney Branch, August 5, 1877.

† **Gnaphalium purpureum**, L. PURPLISH CUDWEED.

June to August.

† **Polymnia Canadensis**, L. LEAF-CUP.

September.

†*Polymnia Uvedalia*, L.

September.

†*Silphium trifoliatum*, L. ROSIN-PLANT.

July.

†*Chrysogonum Virginianum*, L.

April and May. Often flowers at the height of 3^{cm} or 4^{cm}, and continues flowering while the stem elongates, after the manner of *Saxifraga Virginiensis*, q. v. Autumnal flowers observed October 9, 1881.

†*Ambrosia trifida*, L. GREAT RAGWEED.

August, September.

†*Ambrosia trifida*, L., var. *integrifolia*, Gray.

August, September.

†*Ambrosia artemisiæfolia*, L. ROMAN WORMWOOD. HOG-WEED. BITTER-WEED.

Tends to become diœcious, and the fruiting plants crowd out the staminate ones. August, September.

†*Xanthium strumarium*, L. COCKLEBUR.

August, September.

†*Xanthium spinosum*, L. SPINY CLOTBUR.

Abundant in the streets and vacant lots a few years ago, but now becoming fortunately quite scarce. August.

Heliopsis lævis, Pers. OX-EYE. FALSE SUNFLOWER

August to September.

†*Eclipta procumbens*, Michx.

This plant behaves like an introduced weed, tending to invade the streets and gutters. It is rare outside of the city. September.

†*Rudbeckia laciniata*, L. CONE-FLOWER.

August, September.

Rudbeckia triloba, L.

Little Falls, rare; the lobed lower leaves generally wanting. July, August.

Rudbeckia hirta, L.

June, July.

†*Rudbeckia fulgida*, Ait. BRILLIANT CONE-FLOWER.

A form was found near the Woodley Park Bridge, with all the rays tubular. It also exhibits the most remarkable variations in the radical leaves. September.

Helianthus annuus, L. COMMON SUNFLOWER.

Sparingly escaped. August.

†*Helianthus angustifolius*, L. WILD SUNFLOWER.

Terra Cotta; Reform School. Middle of September.

Helianthus occidentalis, Riddell.

Little Falls, on the rocky flats. Early in September.

†*Helianthus giganteus*, L.

September.

†*Helianthus strumosus*, L.

Not common. September.

Helianthus strumosus, L., var. *mollis*, Gray.

Forms of the preceding with the under surface of the leaves quite downy occur, and may be referred here. September.

Helianthus divaricatus, L.

July.

†*Helianthus decapetalus*, L.

July, August.

Helianthus doronicoides, Lam.

September.

Helianthus tuberosus, L. JERUSALEM ARTICHOKES.

Waste places in the city. Late in September and in October.

†*Actinomeris squarrosa*, Nutt.

September.

Verbesina Siegesbeckia, Michx. CROWNBEARD.

September.

Coreopsis tinctoria, Radius. TICKSEED.

Escaped in a few places. June.

†*Coreopsis verticillata*, L. WHORLED COREOPSIS.

Middle to end of June. Well worthy of cultivation.

†*Coreopsis tripteris*, L. TALL COREOPSIS.

Bluffs below Chain Bridge, Va., High Island, and near Langley. August.

Coreopsis discoidea, Torr. & Gray.

Holmead Swamp. September.

†*Bidens frondosa*, L. COMMON BEGGAR-TICKS.

August, September.

†*Bidens cernua*, L. SMALLER BUR-MARIGOLD.

Very variable. September, October.

†*Bidens chrysanthemoides*, Michx. LARGER BUR-MARIGOLD.

July, August.

†*Bidens bipinnata*, L. SPANISH NEEDLES.

August, September.

†*Helenium autumnale*, L. SNEEZE-WEED. AUTUMN SNEEZEWEED.

August.

†*Achillea Millefolium*, L. YARROW. MILFOIL.

June.

Anthemis arvensis, L. CORN CHAMOMILE.

May to October.

†*Maruta Cotula*, DC. [*Anthemis*, Benth. & Hook., Gen. Pl.] MAY-WEED.

Rare. May, June.

†*Leucanthemum vulgare*, L. [*Chrysanthemum*, Benth. & Hook., Gen. Pl.] OX-EYE
DAISY. WHITE-WEED.

May, June.

†*Arnica nudicaulis*, Ell. LEOPARD'S BANE.

Late in May or early in June. Rather rare.

†*Erechthites hieracifolia*, Raf. FIRE-WEED.

September.

†*Senecio aureus*, L. GOLDEN RAGWORT. SQUAW-WEED.

Young leaves glabrous, round kidney-shaped, and purple beneath. Alluvial and sandy bottoms. April 1 to May 15.

†*Senecio aureus*, L., var. *Balsamitæ*, Gray.

This is the upland form, and flowers nearly a month later. It seems to be a distinct species. June.

†*Cacalia suaveolens*, L. [*Senecio*, Benth. & Hook., Gen. Pl.] SWEET-SCENTED
INDIAN PLANTAIN.

August to October.

†*Cacalia reniformis*, Muhl. GREAT INDIAN PLANTAIN.

High Island; rare. June.

Cacalia atriplicifolia, L. PALE INDIAN PLANTAIN.

August.

†*Lappa officinalis*, Allioni. [*Arctium*, Benth. & Hook., Gen. Pl.] BURDOCK.

July.

†*Cnicus lanceolatus*, Gray. [*Cirsium lanceolatum*, Scop.]. COMMON THISTLE. BULL-
THISTLE.

July.

†*Cnicus discolor*, Gray. [*Cirsium discolor*, Spreng.].

July, August.

Cnicus altissimus, Gray. [*Cirsium altissimum*, Spreng.].

June to September.

Cnicus arvensis, Gray. [*Cirsium arvense*, Scop.]. CANADA THISTLE.

Waste places in the city. July, August.

Onopordon acanthium, L. COTTON-THISTLE. SCOTCH THISTLE.

Formerly found in Washington; abundant in Alexandria. June.

Centaurea Cyanus, L. BLUEBOTTLE.

K Street, S. E., over the B. & P. R. R. tunnel. Escaped. June.

Centaurea Calcitrapa, L. STAR-THISTLE.

Less common than formerly in Washington; still abundant in Alexandria. Said to have been brought here during the war. July.

Cichorium Intybus, L. CHICORY.

June to August.

†**Krigia Virginica**, Willd. DWARF DANDELION.

April to June.

†**Cynthia Dandelion**, DC. [*Krigia*, Benth. & Hook., Gen. Pl.] DANDELION CYNTHIA.

Second and third weeks in May.

†**Hieracium scabrum**, Michx. ROUGH HAWK-WEED.

September.

†**Hieracium Gronovii**, L. HAIRY HAWK-WEED.

A form occurs having the panicle of *H. venosum* but the achenia of *H. Gronovii*.
August, September.

†**Hieracium venosum**, L. RATTLESNAKE-WEED.

Latter part of May.

Hieracium venosum, L., var. *subcaulescens*, Gray.

Roach's Run, above the Long Bridge. May 19, 1878.

†**Hieracium paniculatum**, L. PANICLED HAWK-WEED.

Left bank of Rock Creek above the Ford; rare. Early part of September.

†**Taraxacum Dens-leonis**, Desf. COMMON DANDELION.

Flowers the year round unless very cold or very hot and dry.

Chondrilla juncea, L.

Recently introduced, but now becoming abundant everywhere. July. Radical
and stem leaves should be collected in May.

†**Lactuca Canadensis**, L. WILD LETTUCE.

June to August.

Lactuca Canadensis, L., var. *integrifolia*, Torr. & Gray.

July, August.

Mulgedium acuminatum, DC. [*Lactuca*, Benth. & Hook., Gen. Pl.] FALSE LET-
TUCE. BLUE LETTUCE.

Rock Creek. Less common than the next. August, September.

†**Mulgedium Floridanum**, DC.

August, September.

Mulgedium leucophæum, DC.

Bladensburg (Professor Chickering.)

†**Nabalus albus**, Hook. [*Prenanthes*, Benth. & Hook., Gen. Pl.] WHITE LETTUCE.
RATTLESNAKE-ROOT.

September.

†**Nabalus Fraseri**, DC. LION'S-FOOT. GALL-OF-THE-EARTH.

September.

†**Sonchus oleraceus**, L. COMMON SOW-THISTLE.

June.

Sonchus asper, Vill. SPINY-LEAVED SOW-THISTLE.

June.

LOBELIACEÆ.

LOBELIA FAMILY.

†*Lobelia cardinalis*, L. CARDINAL-FLOWER.

Middle of August to middle of September.

†*Lobelia syphilitica*, L. GREAT LOBELIA.

September.

†*Lobelia puberula*, Michx.

Specimens found October 1, 1876, measured $1\frac{1}{4}$ m in height. It seems to flower throughout the summer, having been collected in good condition May 30, 1874, June 8, 1873, September 21, 1873, and October 1, 1876.

†*Lobelia spicata*, Lam.

June.

†*Lobelia inflata*, L. INDIAN TOBACCO.

August, September.

CAMPANULACEÆ.

CAMPANULA FAMILY.

†*Specularia perfoliata*, A. DC. VENUS'S LOOKING-GLASS.

End of May or first of June.

Campanula Americana, L. TALL BELLFLOWER.

High Island. Early in July.

ERICACEÆ.

HEATH FAMILY.

†*Gaylussacia dumosa*, Torr. & Gray. DWARF HUCKLEBERRY.

Terra Cotta Swamp, June 11, 1876, in flower; Agricultural College, Md. (Professor Chickering); rare.

†*Gaylussacia frondosa*, Torr. & Gray. BLUE TANGLE. DANGLEBERRY.

May; fruit in July.

†*Gaylussacia resinosa*, Torr. & Gray. BLACK HUCKLEBERRY.

Middle of May; fruit, last of June or in July.

Vaccinium vacillans, Solander. LOW BLUEBERRY.

Sterile plants often prostrate, with leaves more or less two-ranked. A thin-leaved form, growing in thickets and flowering with or after the leaves, occurs near the Reform School, and a form with brilliant pink buds and corolla, and with flowers wholly in advance of the leaves, is abundant on bare rocks at Great Falls. Last week in April or first of May; fruit, last of June.

†*Vaccinium stamineum*, L. DEERBERRY. SQUAW-HUCKLEBERRY.

Last half of May; fruit, middle of July.

†*Vaccinium corymbosum*, L. COMMON BLUEBERRY. SWAMP-BLUEBERRY.

Last half of April; fruit in July.

†*Epigæa repens*, L. TRAILING ARBUTUS.

Functionally dioecious, the male flowers larger than the female. [See *American Naturalist*, March, 1880, p. 198.] Middle of March to middle of April; fruit, last of May.

†*Gaultheria procumbens*, L. WINTERGREEN. CHECKERBERRY.

Ridge above Blagden's Mill; rare. First week in July; fruit persistent through the winter.

†*Andromeda Mariana*, L. STAGGER-BUSH.

Middle of May to middle of June.

†*Andromeda ligustrina*, Muhl. LYON'S ANDROMEDA.

Second to fourth week in June.

†*Leucothoë racemosa*, Gray.

The pedicels which nod in the flower become horizontal in the fruit on opposite sides of the rachis, rendering the raceme flat and distichous. Last of May or first of June.

†*Kalmia latifolia*, L. MOUNTAIN LAUREL. CALICO-BUSH.

First half of June.

Kalmia angustifolia, L. SHEEP-LAUREL. LAMBKILL.

Found only in the northeast section. Last of May or first half of June.

†*Rhododendron viscosum*, Torr. [*Azalea viscosa*, L.]. CLAMMY AZALEA. WHITE SWAMP-HONEYSUCKLE.

June.

Rhododendron viscosum, Torr., var. *glaucum*, Gray. [*Azalea viscosa*, L., var. *glauca*, Gray.]

Terra Cotta Swamp; Agricultural College, Md. Last week in May; earlier than the preceding or the following.

Rhododendron viscosum, Torr., var. *nitidum*, Gray. [*Azalea viscosa*, L., var. *nitida*, Gray.] Terra Cotta Swamp; Bladensburg. June.†*Rhododendron nudiflorum*, Torr. [*Azalea nudiflora*, L.]. PURPLE AZALEA. PINXTER-FLOWER.

Second or third week in May.

†*Rhododendron maximum*, L. GREAT LAUREL. ROSE BAY.

First Ravine below Chain Bridge, Va. Last of June or first of July.

†*Chimaphila umbellata*, Nutt. PRINCE'S PINE. PIPSISSEWA.

Last week in June.

†*Chimaphila maculata*, Pursh. SPOTTED WINTERGREEN.

First week in July. One week later than the last.

Pyrola secunda, L.

Pine woods; not common. Middle of June.

Pyrola chlorantha, Swartz.

Pine woods; rather rare. Last of May or first of June.

Pyrola elliptica, Nutt. SHIN-LEAF.

Carroll Estate. Last week in June.

†*Pyrola rotundifolia*, L. ROUND-LEAVED PYROLA.

Last week in June.

†*Monotropa uniflora*, L. INDIAN PIPE. CORPSE-PLANT.

June to September.

†*Monotropa Hypopitys*, L. PINE-SAP. FALSE BEECH-DROPS.

July to October.

PRIMULACEÆ.

PRIMROSE FAMILY.

†*Dodecatheon Meadia*, L. AMERICAN COWSLIP. SHOOTING-STAR.

Coreoran's Woods; Foundry Run. Second or third week in May.

†*Steironema ciliatum*, Raf. [*Lysimachia ciliata*, L.]. LOOSESTRIFE.

June.

Steironema lanceolatum, Gray. [*Lysimachia lanceolata*, Walt.].

Eastern Branch, above Benning's Bridge, between tides. Also intermediate forms leading to the next, above Sandy Landing. First week in July.

†*Steironema lanceolatum*, var. *hybridum*, Gray. (*vide* Gray). [*Lysimachia lanceolata*, Walt., var. *angustifolia* (not *hybrida*!), Gray.]

Great Falls, Va.; also above Sandy Landing, where transition forms connect it with the type. First week in July.

†*Steironema longifolium*, Gray. [*Lysimachia longifolia*, Pursh.]

Flats below Eads' Mill. Second to fourth week in July.

†*Lysimachia quadrifolia*, L. FOUR-LEAVED LOOSESTRIFE.

End of May or in June.

†*Lysimachia stricta*, Ait. LOOSESTRIFE.

Last week in June or first week in July.

Lysimachia nummularia, L. MONEYWORT.

Scarcely escaped. End of May.

†*Anagallis arvensis*, L. COMMON PIMPERNEL. POOR MAN'S WEATHER-GLASS.

On rocks under Chain Bridge. Only three specimens found. Also observed by Miss M. A. M'Makin, at Burke's Station, Fairfax Co., Va., from which place at her request specimens were sent me by Mrs. U. H. Herbert. July to September.

†*Samolus Valerandi*, L., var. *Americanus*, Gray. WATER PIMPERNEL. BROOK-WEED.

Chain Bridge (one specimen); mouth of Difficult Run. First half of July.

EBENACEÆ.

EBONY FAMILY.

†*Diospyros Virginiana*, L. PERSIMMON.

As regards the fruit at least, there are two quite well-marked varieties, in one of which the fruit ripens nearly a month earlier, is reddish, especially within, and mealy, rendering it very pleasant. In the other later-maturing kind, the fruit, besides being larger, is not reddened or mealy, and is far less palatable. Last half of May; fruit, October and November.

OLEACEÆ

OLIVE FAMILY.

†*Fraxinus Americana*, L. WHITE ASH.

First of May; fruit in July.

†*Fraxinus pubescens*, Lam. RED ASH.

Last of April; fruit in July.

Fraxinus viridis, Michx. f. GREEN ASH.

April; fruit, June or July.

†*Chionanthus Virginica*, L. FRINGE-TREE.

Leaves fragrant in drying. Last half of May.

APOCYNACEÆ.

DOGBANE FAMILY.

Vinca minor, L. PERIWINKLE. (Very improperly called *Myrtle*.)

Frequently with pure white flowers. Escaped in many places. Last of April or first of May.

†*Apocynum cannabinum*, L. DOGBANE. INDIAN HEMP.

Last half of June.

Apocynum cannabinum, L., var. *glaberrimum*, DC.

Flats at Little Falls. I retain De Candolle's variety name, though dropped by Professor Gray, because this form is here very well marked, the typical form being also common. July.

ASCLEPIADACEÆ.

MILKWEED FAMILY.

†*Asclepias tuberosa*, L. BUTTERFLY-WEED. PLEURISY-ROOT.

July.

†*Asclepias rubra*, L.

Holmead and Terra Cotta Swamps; rare. Middle of July.

†*Asclepias purpurascens*, L. PURPLE MILKWEED.

Not common.

†*Asclepias incarnata*, L. SWAMP MILKWEED.

Last of July.

Asclepias incarnata, L., var. *pulchra*, Pers.

First of August.

†*Asclepias Cornuti*, Decsne. COMMON MILKWEED. SILKWEED.

Last half of June.

†*Asclepias obtusifolia*, Michx.

June.

†*Asclepias variegata*, L. VARIEGATED MILKWEED.

Last of May to middle of June.

Bull. Nat. Mus. No. 22—7

†*Asclepias quadrifolia*, Jacq. FOUR-LEAVED MILKWEED.

Very handsome and should be cultivated if possible. Not common. Last of May.

†*Asclepias verticillata*, L. WHORLED MILKWEED.

Foliage very pretty and delicate. Deserves more attention from floriculturists. July.

†*Acerates viridiflora*, Ell. [*Gomphocarpus*, Benth. & Hook., Gen. Pl.] GREEN MILKWEED.

July.

†*Enslenia albida*, Nutt. ENSLEN'S VINE.

High Island; Mt. Vernon (Professor Chickering), where only it has been observed to fruit. Last half of July.

Gonolobus obliquus, R. Br. FALSE CHOKE-DOG.

Rock Creek; High Island. First half of June. A green-flowered variety of this species occurs on High Island along with the type.

†*Gonolobus hirsutus*, Michx.

Insane Asylum; Hunting Creek. First half of June.

GENTIANACEÆ.

GENTIAN FAMILY.

†*Sabbatia angularis*, Pursh. AMERICAN CENTAURY.

Last week in July or early in August. For certain peculiarities of this plant, see the *Gardener's Monthly* for September, 1878, p. 278, and the *American Entomologist* for April, 1880, p. 88.

†*Gentiana Saponaria*, L. SOAPWORT-GENTIAN.

September.

Gentiana Andrewsii, Griseb. CLOSED GENTIAN.

Not common. Last of September or first of October.

†*Gentiana ochroleuca*, Froel. YELLOWISH-WHITE GENTIAN.

September.

†*Bartonia tenella*, Muhl. SCREW-STEM.

Reform School. Last half of July.

†*Obolaria Virginica*, L. PENNYWORT.

March, April.

POLEMONIACEÆ.

POLEMONIUM FAMILY.

†*Phlox paniculata*, L.

Middle of July to middle of August.

†*Phlox maculata*, L. WILD SWEET-WILLIAM.

Falls Church (Professor Chickering); Reform School; Back Lick Run, Va.; not common. Second week in May.

†*Phlox pilosa*, L.

Herndon, Va., May 27, 1878 (Professor Chickering).

†*Phlox divaricata*, L.

April, May. Autumnal flowers, October 16, 1873.

†*Phlox subulata*, L. MOSS-PINK. GROUND-PINK.

Great Falls. April, May.

Polemonium reptans, L. CREEPING GREEK VALERIAN.

Rock Creek below Piney Branch; also found at Falls Church by Professor Chickering. First of May.

HYDROPHYLLACEÆ.

WATERLEAF FAMILY.

†*Hydrophyllum Virginicum*, L. WATERLEAF

Early leaves spotted. Last half of May.

†*Ellisia Nyctelea*, L.

Not common. May.

†*Phacelia Purshii*, Buckley.

Larkspur Island. Discovered May 23, 1877, by the Rev. Thomas Morong; Pimmitt Run (Professor Chickering).

Phacelia parviflora, Pursh.

Pimmitt Run. May.

BORRAGINACEÆ.

BORAGE FAMILY.

†*Cynoglossum officinale*, L. COMMON HOUND'S-TONGUE.

Both white and pink flowered; not common. Last of May to middle of June.

†*Cynoglossum Virginicum*, L. WILD COMFREY.

Middle of May.

†*Echinospermum Virginicum*, Lehm. [*Cynoglossum Morisoni*, DC.] BEGGAR'S LICE.

Middle of July. The large and very distinctive radical leaves, not sufficiently observed, should be collected early in June.

†*Mertensia Virginica*, DC. VIRGINIAN COWSLIP. LUNGWORT.

April, May. Pure albinos common.

†*Myosotis palustris*, With. FORGET-ME-NOT.

May.

Myosotis laxa, Lehm. [*M. palustris*, With., var. *laxa*, Gray.]

May.

Myosotis arvensis, Hoffm. FIELD SCORPION-GRASS.

Last half of May.

Myosotis verna, Nutt. SPRING SCORPION-GRASS.

May.

†*Lithospermum arvense*, L. CORN GROMWELL.

April.

†*Lithospermum canescens*, Lehm. HOARY PUCCOON. ALKANET.

Near Langley. Only one specimen found, May 27, 1877.

† *Onosmodium Virginianum*, DC. FALSE GROMWELL.

Terra Cotta; Potomac Boat Club Landing; also near Bladensburg (Professor Chickering). Middle of June.

† *Echium vulgare*, L. VIPER'S BUGLOSS. BLUE THISTLE. BLUE-WEED.

First half of June. Autumnal flowers collected October 8, 1880.

CONVOLVULACEÆ.

MORNING-GLORY FAMILY.

† *Ipomœa coccinea*, L. [*Quamoclit coccinea*, Moench.]

Sparingly escaped from cultivation. September.

† *Ipomœa Nil*, Roth. SMALL MORNING-GLORY.

More common than the last. June to August.

† *Ipomœa purpurea*, Lam. COMMON MORNING-GLORY.

Escaped in some places. September.

† *Ipomœa pandurata*, Meyer. MAN-OF-THE-EARTH. WILD POTATO-VINE.

Last of July or first of August.

† *Ipomœa lacunosa*, L. WHITE-STAR IPOMœA.

First half of September.

† *Convolvulus spithameus*, L. [*Calystegia spithamea*, Pursh.] LOW BINDWEED.

Near Ivy City and in Virginia; not common. Last of May.

† *Convolvulus sepium*, L. [*Calystegia sepium*, R. Br.] HEDGE BINDWEED.

June to August.

† *Convolvulus arvensis*, L. BINDWEED.

Very rare. Formerly along the wall of the National Hospital for the Insane, but now destroyed; also in the Park between Third and Four-and-a-half streets. I transplanted a vine in my garden and it has bloomed freely two summers, but no capsules have formed. June.

† *Cuscuta chlorocarpa*, Eng. DODDER.

Shores of the river on *Dianthera*, &c., forming beds. July, August.

† *Cuscuta arvensis*, Beyrich.

July to September.

† *Cuscuta Gronovii*, Willd. COMMON AMERICAN DODDER.

September.

SOLANACEÆ.

NIGHTSHADE FAMILY.

† *Solanum nigrum*, L. COMMON NIGHTSHADE.

June, July.

† *Solanum Carolinense*, L. HORSE-NETTLE.

June, July.

† *Physalis pubescens*, L. GROUND-CHERRY.

Rare. September, October.

†*Physalis viscosa*, L.

June.

†*Nicandra physaloides*, Gaertn. APPLE-OF-PERU.

Georgetown (Professor Chickering).

Lycium vulgare, Duval. MATRIMONY-VINE.

Canal in Georgetown; also, Bladensburg. End of May to November.

†*Datura Stramonium*, L. COMMON STRAMONIUM. JAMESTOWN-WEED ("JIMSON-WEED"). THORN-APPLE.

July to September.

Datura Tatula, L. PURPLE THORN-APPLE.

More abundant than the last and larger. July to September.

SCROPHULARIACEÆ.

FIGWORT FAMILY.

†*Verbascum Thapsus*, L. COMMON MULLEIN.

July or August.

†*Verbascum Blattaria*, L. MOTH-MULLEIN.

June, July.

†*Linaria Canadensis*, Dumont. WILD TOAD-FLAX.

In fields, not very common. Middle of May.

†*Linaria vulgaris*, Mill. TOAD-FLAX. BUTTER-AND-EGGS. RAMSTED.

May, June. Autumnal flowers observed November 1, 1881.

†*Linaria Elatine*, Mill.

National Deaf Mute College Grounds (Professor Chickering).

†*Scrophularia nodosa*, L. FIGWORT.

Not common. August.

†*Chelone glabra*, L. TURTLE-HEAD. SNAKE-HEAD. BALMONY.

August, September.

†*Pentstemon pubescens*, Solander. BEARD-TONGUE.

High Island; Great Falls. Middle to end of May.

†*Pentstemon lævigatus*, Solander. [*P. Digitalis*, Nutt.]

May.

†*Mimulus ringens*, L. MONKEY-FLOWER.

July.

†*Mimulus alatus*, Solander. WINGED MONKEY-FLOWER.

July, August.

Herpestis nigrescens, Benth.

Flats below Eads' Mill, July 18, 1880, in flower; also in the same place, September 12, 1880, in both flower and fruit; rare. Could not be found this year (1881).

†*Gratiola Virginiana*, L. HEDGE-HYSSOP.

May.

†*Gratiola pilosa*, Michx.

Not common. A slender, simple form, and a stout, branching form. July, August

†*Tysanthes gratioloides*, Benth. FALSE PIMPERNEL.

The sterile stamens consist of erect staminodia with much smaller upwardly curved hooks projecting from them on the outer side. July.

†*Micranthemum Nuttallii*, Gray.

Hunting Creek. September, October.

†*Veronica Virginica*, L. CULVER'S PHYSIC.

July, August.

†*Veronica Americana*, Schwein. AMERICAN BROOKLIME.

Near Langley, Va. May 27, 1877.

†*Veronica scutellata*, L. MARSH SPEEDWELL.

Flats below Eads' Mill. July, August.

†*Veronica officinalis*, L. COMMON SPEEDWELL.

Last of May or first of June; autumnal flowers, October 28, 1873.

†*Veronica serpyllifolia*, L. THYME-LEAVED SPEEDWELL.

A form with large (15mm wide) leaves was found at the mouth of Difficult Run, growing in perpetual shade under the cliffs. First half of May.

†*Veronica peregrina*, L. NECKWEED. PURSLANE SPEEDWELL.

Last week in April or first of May.

†*Veronica arvensis*, L. CORN SPEEDWELL.

First week in May.

†*Buchnera Americana*, L. BLUE-HEARTS.

Reform School. July to September.

†*Gerardia pedicularia*, L. FERN-LEAVED FALSE FOXGLOVE.

Last of August or in September.

†*Gerardia flava*, L. DOWNY FALSE FOXGLOVE.

Middle to end of July.

†*Gerardia quercifolia*, Pursh.

Great Falls. Collected only on October 5, 1879; then too far advanced.

†*Gerardia purpurea*, L. PURPLE GERARDIA.

August, September.

†*Gerardia tenuifolia*, Vahl. SLENDER GERARDIA.

Last of August or first of September.

†*Pedicularis Canadensis*, L. WOOD-BETONY. LOUSEWORT.

April.

†*Pedicularis lanceolata*, Michx.

Hunting Creek. Last of September.

†*Melampyrum Americanum*, Michx. COW-WHEAT.

Carroll Estate. September.

OROBANCHACEÆ.

BROOM-RAPE FAMILY.

Orobanche minor, L. LESSER BROOM-RAPE.

Last of May or first of June.

† **Aphyllon uniflorum**, Gray. ONE-FLOWERED BROOM-RAPE.

Rare. End of May.

† **Conopholis Americana**, Wallroth. SQUAW-ROOT. CANCER-ROOT.

Last half of May.

† **Epiphegus Virginiana**, Bart. BEECH-DROPS.

Thickened base of the stem forming a large scaly corm, which when freshly cut open has the odor of potatoes. September.

LENTIBULACEÆ.

BLADDERWORT FAMILY.

† **Utricularia vulgaris**, L. GREATER BLADDERWORT.

Virginia, below Custis Spring (Dr. Foreman.)

† **Utricularia gibba**, L.

Flats above Eads' Mill. September.

BIGNONIACEÆ.

BIGNONIA FAMILY.

† **Tecoma radicans**, Juss. TRUMPET-FLOWER.

Last of June or in July.

† **Catalpa bignonioides**, Walt. INDIAN BEAN.

Probably not indigenous. Middle of June.

ACANTHACEÆ.

ACANTHUS FAMILY.

Ruellia ciliosa, Pursh. [*Dipteracanthus ciliatus*, Nees.] RUEL. LONG-TUBED RUELLIA.

Dry ground. First half of July.

Ruellia ciliosa, Pursh, var. **ambigua**, Gray.

In damp ground. Middle of July.

† **Ruellia strepens**, L. [*Dipteracanthus strepens*, Nees.] SHORT-TUBED RUELLIA.

Flats above the Outlet Lock. First half of June. A month earlier than the last.

† **Dianthera Americana**, L. WATER-WILLOW.

June.

VERBENACEÆ.

VERVAIN FAMILY.

† **Phryma Leptostachya**, L. LOPSEED.

July.

† *Verbena officinalis*, L. EUROPEAN VERVAIN.

Georgetown. June.

† *Verbena urticæfolia*, L. NETTLE-LEAVED VERVAIN. WHITE VERVAIN.

Usually more or less covered with a white mold which seems to be peculiar to this species. Last of July.

† *Verbena angustifolia*, Michx. NARROW-LEAVED VERVAIN.

June.

† *Verbena hastata*, L. BLUE VERVAIN.

July.

Lippia lanceolata, Michx. FOG-FRUIT.

July.

LABIATÆ.

MINT FAMILY.

† *Trichostema dichotomum*, L. BLUE CURLS.

The pink-flowered variety also occurs here. September.

† *Isanthus cæruleus*, Michx. FALSE PENNYROYAL.

Flats above the Outlet Lock. August.

† *Teucrium Canadense*, L. AMERICAN GERMANDER. WOOD-SAGE.

First half of July.

† *Collinsonia Canadensis*, L. COLLINSON'S FLOWER. HORSE-BALM. RICH-WEED. STONE-ROOT.

Root a large cork-like tuber from which proceed long, slender fibres. First half of September.

Perilla ocimoides, L., var. *crispa* (Gray?). BEEFSTEAK PLANT.

Crystal Spring. Escaped. First half of September.

† *Mentha viridis*, L. SPEARMINT.

Last of July or first of August.

Mentha piperita, L. PEPPERMINT.

August, September.

† *Mentha Canadensis*, L. WILD MINT.

August.

† *Lycopus Virginicus*, L. BUGLE-WEED.

September.

† *Lycopus rubellus*, Moench. [*L. Europæus*, L., var. *integrifolius*, Gray.] WATER HOARHOUD. GIPSWORT.

Lycopus sinuatus, Ell. [*L. Europæus*, L., var. *sinuatus*, Gray.]

July.

† *Cunila Mariana*, L. DITTANY.

September.

† *Pycnanthemum linifolium*, Pursh. MOUNTAIN MINT.

July.

†*Pycnanthemum lanceolatum*, Pursh.

Roach's Run, Va. Taste and smell of *Hedeoma*. August, September.

†*Pycnanthemum muticum*, Pers.

July, August.

†*Pycnanthemum Torreyi*, Benth.

Rock Creek opposite Crystal Spring; Bluffs below Chain Bridge, Va. July, August.

Pycnanthemum clinopodioides, Gray.

July, August.

†*Pycnanthemum incanum*, Michx.

July, August.

†*Calamintha Nepeta*, Link. BASIL-THYME.

June to November.

†*Calamintha Clinopodium*, Benth. BASIL.

July to September.

†*Melissa officinalis*, L. BALM.

Breutwood. July.

†*Hedeoma pulegioides*, Pers. AMERICAN PENNYROYAL.

August.

†*Salvia lyrata*, L. LYRE-LEAVED SAGE.

May.

†*Salvia urticifolia*, L. NETTLE-LEAVED SAGE.

Last of May or first half of June.

†*Monarda fistulosa*, L. WILD BERGAMOT.

June, July.

†*Monarda punctata*, L. HORSE-MINT.

August.

†*Lophanthus nepetoides*, Benth. GIANT HYSSOP.

August.

†*Nepeta Cataria*, L. CATNIP.

July.

†*Nepeta Glechoma*, Benth. GROUND IVY.

April.

†*Scutellaria lateriflora*, L. MAD-DOG SKULLCAP.

Last half of July.

Scutellaria saxatilis, Riddell. ROCK SKULLCAP.

Potomac Shore, Va., above the Potomac Boat Club Landing, in a dry gulch. Locality very circumscribed. Last week in July or first of August.

†*Scutellaria serrata*, Andrews. SKULLCAP.

Last of May or first of June.

†*Scutellaria pilosa*, Michx.

June.

†*Scutellaria integrifolia*, L.

June.

†*Scutellaria nervosa*, Pursh.

Insane Asylum. Last half of May.

†*Brunella vulgaris*, L. SELF-HEAL. HEAL-ALL.

June to August.

†*Physostegia Virginiana*, Benth. FALSE DRAGON-HEAD.

Rocks, Potomac shore. July, August.

†*Marrubium vulgare*, L. COMMON HOARHOUND.

June.

†*Leonurus Cardiacæ*, L. COMMON MOTHERWORT.

June, July.

†*Lamium amplexicaule*, L. DEAD-NETTLE.

March, April.

Stachys palustris, L. HEDGE-NETTLE.

Found only on June 26, 1874, in thickets of smilax between Fifteenth and Sixteenth streets, near Boundary, in swampy ground, now drained.

†*Stachys aspera*, Michx. [*S. palustris* L., var. *aspera*, Gray.]

The common form here. June.

PLANTAGINACEÆ.

PLANTAIN FAMILY.

Plantago cordata, Lam.

Sandy shore of the Potomac, opposite Alexandria. First found by Prof. J. H. Comstock, May 1, 1881; then in good condition. Roots large, white, divergently branching, and abruptly truncated at the end, from which truncated extremities, and from no other part, proceed bundles of long, white fibers.

†*Plantago major*, L. COMMON PLANTAIN.

June, July.

Plantago Rugelii, Deesne.

More common than the last. July.

†*Plantago lanceolata*, L. RIBGRASS. RIPLEGRASS. ENGLISH PLANTAIN.

A form with compound heads occurs, also a form with white stripes in the leaves. May.

Plantago Patagonica, Jacq., var. *aristata*, Gray.

Vacant lot on B street S. W., between Eleventh and Twelfth streets (Dr. Vasey).

†*Plantago Virginica*, L.

Varying immensely in size; specimens found near Ivy City, May 8, 1878, being nearly half a meter in height. First half of May.

AMARANTACEÆ.

AMARANTH FAMILY.

Amarantus paniculatus, L. RED AMARANTH.

Rare out of gardens. August, September.

† **Amarantus retroflexus**, L. GREEN AMARANTH. PIGWEED.

August, September.

Amarantus albus, L.

Alexandria; Not common. September.

† **Amarantus spinosus**, L. THORNY AMARANTH.

July, August.

† **Acnida cannabina**, L. WATER-HEMP.

Potomac shores, between tides; also on the Eastern Branch. August.

CHENOPODIACEÆ.

GOOSEFOOT FAMILY.

† **Chenopodium album**, L. LAMB'S-QUARTERS. PIGWEED.

June, July.

Chenopodium Boscianum, Moq. [*C. album*, L., var. *Boscianum*, Gray.]

July.

Chenopodium urbicum, L.

Vacant lots in the city; rare. July, August.

Chenopodium murale, L.

Not common. September.

Chenopodium Botrys, L.

Waste places in the city; rare; not seen since 1874.

Chenopodium ambrosioides, L. MEXICAN TEA.

August, September.

† **Chenopodium ambrosioides**, L., var. *anthelminticum*, Gray. WORMSEED.

Too near the last. August, September.

Atriplex patula, L., var. *hastata*, Gray. ORACHE.

White Lot. August, September.

† **Salsola Kali**, L. SALTWORT.

Alexandria (Dr. Vasey).

PHYTOLACCACEÆ.

POKEWEED FAMILY.

† **Phytolacca decandra**, L. POKEWEED.

June.

POLYGONACEÆ.

BUCKWHEAT FAMILY.

Polygonum orientale, L. PRINCE'S FEATHER.

July.

† **Polygonum Pennsylvanicum**, L.

August.

Polygonum incarnatum, Ell.

July, August.

† **Polygonum Persicaria**, L. LADY'S THUMB.

June, July.

Polygonum Hydropiper, L. COMMON SMARTWEED. WATER-PEPPER.

August, September.

Polygonum acre, H. B. K. WATER SMARTWEED.

July.

† **Polygonum hydropiperoides**, Michx. MILD WATER-PEPPER.

Carberry Meadows. August.

Polygonum amphibium, L. WATER PERSICARIA.

Pond on the Carberry Meadows; rare. Only seen once, July 17, 1881.

Polygonum amphibium, L., var. *terrestre*, Willd.

Flats near the Outlet Lock. August.

† **Polygonum Virginianum**, L.

August.

† **Polygonum aviculare**, L. KNOTGRASS. DOORWEED.

June, July.

† **Polygonum erectum**, L. [*P. aviculare*, L., var. *erectum*, Roth.]

July.

† **Polygonum arifolium**, L. HALBERD-LEAVED TEAR-THUMB.

September.

† **Polygonum sagittatum**, L. ARROW-LEAVED TEAR-THUMB.

August, September.

† **Polygonum Convolvulus**, L. BLACK BINDWEED.

July to November.

Polygonum dumetorum, L. CLIMBING FALSE BUCKWHEAT.

August, September.

† **Polygonum dumetorum**, L., var. *scandens*, Gray.

Fagopyrum esculentum, Moench. BUCKWHEAT.

Occasionally found in the vicinity of fields. August.

Rumex Britannica, L. PALE DOCK.

May

Rumex verticillatus, L.

Above Sandy Landing. June, July.

† **Rumex crispus**, L. CURLED DOCK.

June.

† **Rumex obtusifolius**, L. BITTER DOCK.

May to July.

Rumex crispus × **obtusifolius**, Gray, Manual, ed. 5, p. 421.

This well-marked hybrid is this year abundant in the city reservation west of the Capitol, between Four-and-a-half and Sixth streets, where it may be easily compared with both the parent species. It may be roughly described as having the narrow leaves of *R. crispus*, though less wavy-margined, and the toothed valves of *R. obtusifolius*, this character being, however, less evident on the non-grain-bearing valves. The habit of the hybrid is quite distinct from either, being more symmetrical and less ugly. The tendency seen in *R. obtusifolius* to exhibit red midribs and speckles on the leaves is exaggerated in the hybrid.

† **Rumex Acetosella**, L. FIELD SORREL. HORSE SORREL.

Last half of May.

PODOSTEMACEÆ.

RIVER-WEED FAMILY.

Podostemon ceratophyllus, Michx. RIVER-WEED.

Rock Creek, below Lyon's Dam; Difficult Run. June, July.

ARISTOLOCHACEÆ.

BIRTHWORT FAMILY.

† **Asarum Canadense**, L. WILD GINGER. ASARABACCA.

Last of April or first of May.

† **Aristolochia Serpentaria**, L. VIRGINIA SNAKEROOT.

Widely distributed, but nowhere abundant. June.

PIPERACEÆ.† **Saururus cernuus**, L. LIZARD'S TAIL.

July.

LAURACEÆ.

LAUREL FAMILY.

† **Sassafras officinale**, Nees.

April. For an attempt to explain the significance of the rudimentary organs of *Sassafras*, *Lindera*, and other Lauraceous plants, see my paper on "Homologies in the Lauraceæ," read before the A. A. A. S. at Saratoga, and published in the *Scientific American, Supplement*, of September 20, 1879, p. 3089.

† **Lindera Benzoin**, Meisner. SPICE BUSH. BENJAMIN-BUSH.

March, April.

THYMELEACEÆ.

MEZEREUM FAMILY.

Dirca palustris, L. LEATHER-WOOD. MOOSE-WOOD.

Second or third week in April.

SANTALACEÆ.

SANDALWOOD FAMILY.

† *Comandra umbellata*, Nutt. BASTARD TOAD-FLAX.

After flowering this plant throws out runners or prostrate shoots, the leaves on which are two-ranked and spreading. May, June.

LORANTHACEÆ.

MISTLETOE FAMILY.

† *Phoradendron flavescens*, Nutt. AMERICAN MISTLETOE.

Growing here exclusively on *Nyssa multiflora*.

EUPHORBIACEÆ.

SPURGE FAMILY.

† *Euphorbia maculata*, L. SPOTTED SPURGE.

July, August.

† *Euphorbia hypericifolia*, L. LARGER SPOTTED SPURGE.

July, August.

† *Euphorbia corollata*, L. FLOWERING SPURGE.

July, August.

† *Euphorbia Ipecacuanhæ*, L. WILD IPECAC.

Last week in April to end of May.

Euphorbia dictyosperma, Fischer & Meyer.

Agricultural College Station; High Island; Reservoir (Professor Chickering).
Second week in May.

Euphorbia commutata, Eng.

High Island and above. April.

Phyllanthus Carolinensis, Walt.

Corcoran's Woods (Professor Chickering). Locality now apparently exhausted.

† *Acalypha Virginica*, L. THREE-SEEDED MERCURY.

July, August.

Ricinus communis, Desf. CASTOR-OIL BEAN. PALMA-CHRISTI.

Waste places in the city. August.

URTICACEÆ.

NETTLE FAMILY.

† *Ulmus fulva*, Michx. SLIPPERY ELM. RED ELM.

Last half of March.

† *Ulmus Americana*, L. WHITE ELM. AMERICAN ELM.

First week in April.

† *Celtis occidentalis*, L. HACKBERRY. SUGARBERRY.

Early part of May.

Humulus Lupulus, L. COMMON HOP.

Rock Creek, near the Adams Mill; rare. August.

Cannabis sativa, L. HEMP.

Waste lots in the city. August.

Maclura aurantiaca, Nutt. OSAGE-ORANGE. BOIS D'ARC.

Deserted hedges, growing thrifty and bearing fruit. End of May.

† *Morus rubra*, L. RED MULBERRY.

Middle of May; fruit ripe in June.

Morus alba, L. WHITE MULBERRY.

Roadside near Uniontown (Prof. J. H. Comstock), May 7, 1881.

† *Urtica dioica*, L. NETTLE.

July.

† *Laportea Canadensis*, Gaudichaud. WOOD-NETTLE.

July.

† *Pilea pumila*, Gray. RICHWEED. CLEARWEED.

August.

† *Bœhmeria cylindrica*, Willd. FALSE NETTLE.

Two forms; a slender, narrow-leaved, and a shorter, broad-leaved one. July, August.

Parietaria Pennsylvanica, Muhl. PELLITORY.

Below the Insane Asylum. First week in June.

PLATANACEÆ.

PLANE-TREE FAMILY.

† *Platanus occidentalis*, L. AMERICAN PLANE-TREE. SYCAMORE. BUTTONWOOD.

First week in May.

JUGLANDACEÆ.

WALNUT FAMILY.

Carya alba, Nutt. SHELL-BARK HICKORY. SHAG-BARK HICKORY.

Rare, and perhaps only as intentionally planted. Middle of May; fruit, September or October.

Carya microcarpa, Nutt. SMALL-FRUITED HICKORY.

It is to be hoped that this may be ultimately retained as distinct from *C. alba*. The differences in this locality are immense. First week in May; fruit in October.

† *Carya tomentosa*, Nutt. MOCKER-NUT. WHITE-HEART HICKORY.

Second or third week in May; fruit, October or November.

† *Carya porcina*, Nutt. PIG-NUT. BROOM HICKORY. BROWN HICKORY.

First week in May; fruit, October.

† *Carya amara*, Nutt. BITTER-NUT. SWAMP HICKORY. WHITE HICKORY.

Second or third week in May; fruit, September or October.

† *Juglans nigra*, L. BLACK WALNUT.

Second week in May; fruit, October or November.

Juglans cinerea, L. BUTTERNUT.

Not common. Second week in May; fruit, September or October.

MYRICACEÆ.

SWEET GALE FAMILY.

Myrica cerifera, L. BAYBERRY. WAX-MYRTLE.

Terra Cotta Swamp; also bluffs of the Potomac, in Virginia; the former wet, the latter dry ground. Rare; fruit not yet seen. Very irregular in its flowering-time. Staminate flowers have been collected May 2 and June 17, and fertile flowers May 30 and July 15; but both kinds have not been found at the same date.

CUPULIFERÆ.

OAK FAMILY.

† *Betula nigra*, L. RIVER BIRCH. RED BIRCH.

Last half of April or first of May; fruit in June

† *Alnus serrulata*, Ait. SMOOTH ALDER.

Last half of March or first of April.

† *Carpinus Caroliniana*, Walt. [*C. Americana*, Michx.] BLUE BEECH. WATER-BEECH. AMERICAN HORNBEAM.

Usually small, 5^{cm} to 10^{cm} in diameter, but one tree is known which has a girth of 1½^m. April; fruit, July.

† *Ostrya Virginica*, Willd. IRON-WOOD. LEVER-WOOD. HOP-HORNBEAM.

April; fruit, July.

† *Corylus Americana*, Walt. HAZEL-NUT. FILBERT.

Rather rare. April; fruit, October.

† *Quercus alba*, L. WHITE OAK.

First week in May; fruit, September.

† *Quercus stellata*, Wang. [*Q. obtusiloba*, Michx.] POST-OAK. ROUGH or BOX WHITE OAK.

First week in May; fruit, late in September.

Quercus macrocarpa, Michx. BUR-OAK. OVER-CUP OAK. MOSSY-CUP WHITE OAK.

Aberrant forms; only one small fruit-bearing tree known, located on Cameron Run.

† *Quercus bicolor*, Willd. SWAMP WHITE OAK.

Varies greatly in leaf and length of peduncle. There is a dwarf form at Little Falls which bears fruit at the height of three to four feet, but these fruit-bearing branches appear to proceed from a large subterranean stump which the annual ice-gorges of that locality have prevented from rising above the ground. First week in May; fruit, end of September.

†**Quercus Michauxii**, Nutt. MICHAUX'S OAK.

There is little doubt that this species occurs here, though it has not yet been clearly distinguished. Forms of the preceding with leaves nearly destitute of white color underneath are common and have been referred to it by Dr. Engelmann, though not typical. At Great Falls, on the Virginia side, are trees appearing to be normal, but neither fruit nor flowers have yet been collected. At Hampton, Va., I saw it well defined. It has the obovate, sinuate leaves, regular in outline but not lobed, of the upland form of *Q. Prinus*, and the smooth, light-colored bark of *Q. bicolor*.

†**Quercus Prinus**, L. CHESTNUT-OAK. ROCK CHESTNUT-OAK.

Two forms; an upland typical form, and a narrow leaved form growing on rocks near the river. First week in May; fruit, first of September, early dropping.

Quercus Muhlenbergii, Eng. [*Quercus Prinus*, L., var. *acuminata*, Michx.] YELLOW CHESTNUT-OAK.

A few trees along Rock Creek, near the mouth of Broad Branch; also a tree discovered by Dr. Vasey, near the District line, above Chain Bridge. This bears fruit, which, however, tends to abort and produce monstrosities. Some of the leaves also have nearly the form of *Q. Prinus*, and I strongly suspect it to be a hybrid. Last of April or first of May; fruit, September.

Quercus prinoides, Willd. DWARF CHESTNUT-OAK. CHINQUAPIN-OAK.

Reform School. Second week in May; fruit, September.

Quercus rubra, L. RED OAK.

First week in May; fruit, October.

†**Quercus coccinea**, Wang. SCARLET OAK.

First week in May; fruit, last of September or first of October.

†**Quercus tinctoria**, Bartram. [*Q. coccinea*, Wang., var. *tinctoria*, Gray.] BLACK OAK. YELLOW-BARKED OAK. QUERCITRON.

Following Sargent, I prefer to restore the time-honored name of Bartram for this species. Last week in April; fruit, first of October.

†**Quercus falcata**, Michx. SPANISH OAK. TURKEY-OAK.

Last of April or first of May; fruit, first of October.

Quercus ilicifolia, Wang. BEAR-OAK. BLACK SCRUB-OAK.

The claims of this species to a place in this catalogue are rather slender. A few specimens of the leaves, unaccompanied by acorns, were brought from the vicinity of Cabin John Run by Major Nutt of the Treasury Department in 1855, who sent them to Dr. E. Foreman, by whom they were deposited in the herbarium of the Department of Agriculture, where they may still be seen. Mr. Wm. Palmer is said to have collected it within a few years, also without fruit, in the vicinity of Falls Church, but his specimens have been sent away and are not accessible. It is to be hoped that it will now be re-discovered.

†**Quercus palustris**, Du Roi. SWAMP SPANISH OAK. PIN-OAK.

Second week in May; fruit, first of October.

†**Quercus nigra**, L. BLACK-JACK. BARREN OAK.

First of May; fruit, last of September.

Quercus imbricaria, Michx. SHINGLE-OAK. LAUREL-OAK.

Trees sometimes large, but dwarf form 2^m to 6^m high is common. First week in May; fruit, first of October.

† *Quercus Phellos*, L. WILLOW-OAK.

Second week in May; fruit, first of October.

Quercus Leana, Nutt. LEA'S OAK.

Carroll Estate. [See *Field and Forest*, October and November, 1875, p. 39; also, *Botanical Gazette*, October, 1880, p. 123.] First week in May; fruit, last half of September.

Quercus heterophylla, Michx. BARTRAM'S OAK.

A number of young trees not bearing fruit, but having leaves closely resembling those of the authentic specimens, have been found. Near Fort Bennett, Va. (Dr. Foreman); High Island (this tree was quite large, and would probably have soon borne fruit, but it was unfortunately girdled); Terra Cotta Swamp (this specimen is now under close surveillance).

† *Castanea pumila*, Mill. CHINQUAPIN.

Second week in June; fruit, October.

† *Castanea vulgaris*, Lam., var. *Americana*, A. DC. CHESTNUT.

First half of June; fruit, October.

† *Fagus ferruginea*, Ait. BEECH.

Last of April; fruit, July.

SALICACEÆ.

WILLOW FAMILY.

Salix nigra, Marshall. BLACK WILLOW.

First week in May.

Salix nigra, Marshall, var. *falcata*, Carey.

Eastern Branch.

Salix nigra, Marshall, var. *Wardi*, Bebb. n. v.

A remarkable form, with the broad leaves much whitened underneath, larger stipules, &c., approaching in appearance *S. cordata*, with which it grows. This peculiar willow has interested me for many years, as I was unable to harmonize its characters with any description or to find its exact counterpart in any collection. Still it was not until the spring of 1880 that I made any special effort to solve the difficulty. I then sent it to Professor Gray, who simply remarked upon it that the ovaries were those of *S. nigra*. I subsequently sent specimens to Mr. M. S. Bebb, who became at once greatly interested in the form. Upon learning that it grew with both *S. nigra* and *S. cordata*, he was at first inclined, as I was also myself, to regard it as a hybrid resulting from the intercrossing of these two species. At his suggestion I have since made the most thorough examination of the plant and the conditions under which it is found, the result of which has greatly weakened the force of this theory, and, judging from Mr. Bebb's careful description, which is appended, he is also less convinced of the cross than formerly.

The plant was first met with among the rocks on the river bottom adjacent to the Chain Bridge and Little Falls, where it predominates over other forms, though *S. nigra* is quite common there, and pistillate plants of *S. cordata* occur somewhat sparingly, in which, in the absence of staminate plants, the ovaries rarely perfect. *S. myricoides*, which is regarded as a cross between *S. sericea* and *S. cordata*, is also present in both sexes, and here too *S. longifolia* is found. But in addition to this locality, I have observed this variety of *S. nigra* as far up the river as Great Falls

and as far below as a point opposite Alexandria, though in neither of these places did it predominate over other forms.

The fact, however, which most influenced my judgment with regard to its hybridity was the respective dates of flowering of *S. nigra* and *S. cordata*. When the latter was fully out in the second week of April, I could see no buds on the former, and when the anthers of *S. nigra* were ready to shed their pollen on the first of May, the pods of *S. cordata*, though empty, were fully developed. The latter bears its flowers before the leaves, the former after, and an interval of three weeks separates the flowering time of the two species. These remarks are not intended as an argument, for it would be arguing without an opponent and against a theory first entertained by myself, but are merely meant to bring out the relations between the forms as my own observations have revealed them to me. In a highly interesting correspondence with Mr. Bebb on this subject, I have expressed my conviction that the form has resulted from the normal process of variation from environing influences, and that the co-existence of the variety with the type (*S. nigra*) is an expression, often observed by me in the case of other plants, of the law which has long been formulated by biologists, that variation goes on most rapidly between forms growing in the closest proximity to each other.

The following is Mr. Bebb's description, which certainly throws all the light upon the subject that is possible in the present state of the investigation:

"*S. NIGRA*, Marsh., var. *WARDI*. Leaves exceedingly variable in outline, the larger lanceolate, roundish at base, obliquely taper-pointed, 4' to 6' or even 7' long by 1' to 1½' wide, the smaller linear-lanceolate, scarcely ½' wide, attenuate-cuspidate, more or less falcate, closely or sometimes slightly and unevenly serrulate, smooth, green above, conspicuously glaucous and veined beneath; petioles short, scarcely exceeding the large, reniform, obtuse, persistent stipules; aments terminating lateral branches (the growth of which is continued from the axil of the uppermost leaf), the staminate usually very long, 3'-4', subflexuose, the orange-yellow flowers rather remotely and subverticillately arranged on the slender rachis, scales ovate, obtuse, pale, smooth outside, villous on the inner surface, stamens mostly 3, intricately villous at base, mature fertile ament 3'-4' long by ½' wide, lax, spreading, rachis angular, thinly villous, scales narrower, smoother and caducous; capsules quite large, globose-conical, glabrous (under a lens minutely granular); pedicels 4-5 times the length of the nectary; style very short or obsolete; stigmas small, notched.

"Staminate aments as in typical *nigra*; lax, fruiting aments as in *amygdaloides*; leaves varying in outline *pari passu* with *nigra* but glaucous beneath like *amygdaloides*. A peculiar form with leaves proportionately shorter and broader, more remotely serrate and prominently reticulate-veined beneath, might be easily mistaken (in the absence of aments) for an extravagant growth of *S. cordata*.

"At first glance our variety *Wardi* would seem to be a geographical equivalent of the more northern and western *S. amygdaloides*, from which, however, it differs in the shortly petioled leaves and large persistent stipules—not to mention less tangible characters—and therefore, without venturing to express any positive opinion in the absence of reliable data, I am inclined to believe rather that it will be found to connect down the coast with sub. sp. *S. longipes* of Florida, which in turn passes into the yet more southern *S. occidentalis*, Bosc.

"The continued growth of the branchlets bearing the aments, though more or less noticeable in other forms of *nigra*, is here developed in a remarkable degree. Thus, before even the staminate aments are fully expanded, not infrequently they are made to appear as if sessile, and opposite a leaf, on the vigorous, growing branches, while a little later in the season the dry persistent rachis of the fruiting ament is found still clinging to the base of branches a foot or more in length."

Last half of May.

Salix fragilis × *alba*, Wimmer. [*S. fragilis*, L., var. *Russelliana*, Gray, Manual; *S. Russelliana*, Smith.]

Eastern Branch Marsh, above Benning's Bridge; also, near the Outlet Lock.

Salix alba, L. WHITE WILLOW.

Last of April or first of May.

† **Salix alba**, L., var. *retellina*, Koch.

Last of April or first of May.

Salix Babylonica, L. WEEPING WILLOW.

April.

Salix longifolia, Muhl. LONG-LEAVED WILLOW.

Flats near Chain Bridge.

† **Salix humilis**, Marshall. PRAIRIE WILLOW.

Middle of April.

Salix tristis, Ait. DWARF GRAY WILLOW.

Last half of March to middle of April.

Salix sericea, Marshall. SILKY WILLOW.

April.

† **Salix cordata**, Muhl. HEART-LEAVED WILLOW.

Eastern Branch Marsh and generally along the Potomac; plants nearly all pistillate, often not fertile, but hybridizing freely with *S. sericea*. The only staminate plant thus far found was nearly opposite Alexandria.

Second or third week in April.

Salix cordata × **sericea**, Bebb. [*S. myricoides*, Muhl! *S. cordata*, var. *myricoides*, Darl. *Flora Cestrica*, ed. 3, p. 278, not of Carey, Andersson, and others.]

Piney Branch.

Salix purpurea, L. PURPLE WILLOW.

Eastern Branch Marsh; planted to protect drainage embankments. Staminate plants only seen. Second week in April.

Populus grandidentata, Michx. LARGE-TOOTHED ASPEN.

Terra Cotta. Male trees only; doubtless originally planted; spreading considerably by subterranean rootstocks. Fully out March 21, 1880.

Populus monilifera, Ait. COTTONWOOD. NECKLACE POPLAR.

Only three mature trees of this species are known within our limits. Of these one is male and two are females. One of the female trees, however, is quite small and has been pushed down by the ice until it is nearly horizontal, but is alive and apparently thrifty. The other two are large, fine trees. The male tree is located near the river, at the water's edge, opposite the third lock, a mile above High Island. The large female tree stands at the southern end of High Island. The small female tree is between this and the canal, and is doubtless the offspring of the other two. There is one other smaller offshoot, standing a short distance from the large female tree, and many more such saplings (swept away several years ago by ice and floods) once grew on the flats in the vicinity of Chain Bridge, probably of the same parentage. The peculiarity, however, which justifies this note is, that while the branches of the male tree are not at all angled and those of the large female are only slightly, yet manifestly so, those of the small female and of all the other young specimens observed are so to a remarkable degree. Unless there be some other means of accounting for the origin of these young trees than that above pointed out, the case must be regarded as affording a demonstration of the identity of this species with the *P. angulata* of Aiton. April.

Populus balsamifera, L., var. *candicans*, Gray. BALM OF GILEAD.

Last half of April.

Populus dilatata, Ait. LOMBARDY POPLAR.

Potomac City, along the Eastern Branch.

Populus alba, L. ABELE. WHITE POPLAR.

Tending to spread and form groves. There are two forms in the city, one of which has small leaves which are scarcely at all whitened underneath. These are all male trees. February or March.

CERATOPHYLLACEÆ.

HORNWORT FAMILY.

Ceratophyllum demersum, L. HORNWORT.

Abundant in the Potomac. July.

MONOCOTYLEDONS.

ARACEÆ.

ARUM FAMILY.

† *Arisæma triphyllum*, Torr. INDIAN TURNIP.

April; fruit, July.

† *Arisæma Dracontium*, Schott. GREEN DRAGON-ROOT.

High Island; Carroll Estate. May; fruit, August.

† *Peltandra Virginica*, Raf. ARROW ARUM.

Leaves sometimes reduced to a simple elliptical blade. July.

† *Symplocarpus foetidus*, Salisb. SKUNK CABBAGE.

February, March.

† *Orontium aquaticum*, L. GOLDEN CLUB.

May, June.

† *Acorus Calamus*, L. SWEET FLAG. CALAMUS.

June.

LEMNACEÆ.

DUCK-WEED FAMILY.

Lemna polyrrhiza, L. DUCKWEED. DUCK'S-MEAT.

TYPHACEÆ.

CAT-TAIL FAMILY.

† *Typha latifolia*, L. COMMON CAT-TAIL. REED-MACE.

June.

† *Typha angustifolia*, L. SMALL CAT-TAIL. NARROW-LEAVED CAT-TAIL.

Last week in May.

† *Sparganium eurycarpum*, Eng. BUR-REED.

July.

- † *Sparganium simplex*, Hudson, var. *androcladum*, Gray.
July.

NAIADACEÆ.

PONDWEED FAMILY.

- Najas flexilis*, Rostk. NAIAD.

No flowers or fruit yet found on this plant.

- Potamogeton natans* L. PONDWEED.

Eastern Branch. Fruit, July.

- Potamogeton Claytonii*, Tuckerm.

Difficult Run. Fruit, July.

- Potamogeton hybridus*, Michx.

Ponds near the canal, below Great Falls. Fruit, July.

- Potamogeton lonchites*, Tuckerm.

Flowers in August; fruit not collected.

- Potamogeton lucens*, L.

Seen in the Potomac as late as October, but always without spikes and wholly submersed.

- † *Potamogeton perfoliatus*, L.

Potomac. Fruit, July 2, 1876.

- Potamogeton pauciflorus*, Pursh.

Pools among rocks at Little Falls. Fruit, July 13, 1879.

- Potamogeton pectinatus*, L.

Common in the Potomac, but as far as yet observed without flowers or fruit.

ALISMACEÆ.

WATER-PLANTAIN FAMILY

- † *Alisma Plantago*, L., var. *Americanum*, Gray. WATER-PLANTAIN.

Under certain circumstances this plant presents floating leaves with long petioles and elliptical blades like the *Potamogetons*. July; floating leaves in April or May.

- † *Sagittaria variabilis*, Eng. ARROW-HEAD.

July to September.

- Sagittaria variabilis*, Eng., var. *angustifolia*, Gray.

Flats below Eads' Mill. A complete series may be collected in which the leaves vary in form from linear to ovate. September.

- † *Sagittaria heterophylla*, Pursh.

First found under the Aqueduct in Foundry Run, but this locality is now destroyed; since found on the Carberry Meadows. July to September.

- † *Sagittaria pusilla*, Nutt.

In the Potomac below Analoetan Island, on muddy bars between tides. July, August; fruit, last of September.

HYDROCHARIDACEÆ.

FROG'S-BIT FAMILY.

Anacharis Canadensis, Planchon. WATER-WEED.

June.

† **Vallisneria spiralis**, L. TAPE-GRASS. EEL-GRASS.

July.

ORCHIDACEÆ.

ORCHIS FAMILY.

† **Orchis spectabilis**, L. SHOWY ORCHIS.

May.

† **Habenaria tridentata**, Hook. REIN-ORCHIS.

August.

Habenaria virescens, Spreng. GREEN REIN-ORCHIS.

Hunting Creek; Eastern Branch Marsh; rare. Third week in June.

† **Habenaria ciliaris**, R. Br. YELLOW FRINGED ORCHIS.

A single specimen found July 21, 1878, by Prof. M. H. Doolittle, near the Reform School. Not since seen.

† **Habenaria lacera**, R. Br. RAGGED FRINGED ORCHIS.

Very rare; found July 3, 1874, near Boundary and Sixteenth streets, July 12, 1879, in the Terra Cotta region, and June 22, 1881, in Coreoran's Woods; a single specimen in each case, the last in good condition.

† **Goodyera pubescens**, R. Br. RATTLESNAKE-PLANTAIN.

June or July.

Spiranthes latifolia, Torr. BROAD-LEAVED LADIES' TRACES.

A single specimen found May 12, 1878, on the flats below Chain Bridge.

† **Spiranthes cernua**, Richard. DROOPING-FLOWERED LADIES' TRACES.

Last of September.

† **Spiranthes graminea**, Lindl., var. **Walteri**, Gray. GRASS-LEAVED LADIES' TRACES.*

September.

Spiranthes gracilis, Bigelow. SLENDER LADIES' TRACES.

Spikes apparently always twisted in the direction of a right-handed screw. Root leaves usually gone at flowering time, but found still present with the flowers July 4, 1879, at Great Falls. July to September.

Spiranthes simplex, Gray.

Spikes sometimes twisted to the right and sometimes to the left. Pine woods near Bladensburg; rather rare. September.

† **Pogonia ophioglossoides**, Nutt. SNAKE-MOUTH.

A form having leaves 4^{cm} wide was found in the Holmead Swamp, June 13, 1880. First half of June.

† **Pogonia verticillata**, Nutt. WHORLED SNAKE-MOUTH.

Third or fourth week in May.

† *Calopogon pulchellus*, R. Br. GRASS PINK.

Holmead Swamp. Middle of June.

Tipularia discolor, Nutt. CRANE-FLY ORCHIS.

Last week in August; leaves best collected in February or March.

† *Microstylis ophioglossoides*, Nutt. ADDER'S-MOUTH.

Carroll Estate, very rare. Only collected in fruit in September and October. Probably flowers in July.

† *Liparis liliifolia*, Richard. TWAYBLADE.

Last of May.

Liparis Læselii, Richard. GREEN TWAYBLADE.

Woodley. Found in small quantities in 1877 by Mr. M. B. W. Hough; now apparently obliterated. First week in June.

† *Corallorhiza odontorhiza*, Nutt. CORAL-ROOT.

First of October.

Corallorhiza multiflora, Nutt.

Carroll Estate, rare; only once found, in fruit, October 18, 1874.

† *Aplectrum hyemale*, Nutt. PUTTY-ROOT. ADAM-AND-EVE.

First half of June; leaves best in March.

† *Cypripedium parviflorum*, Salisb. SMALL YELLOW MOCCASIN FLOWER or LADY'S SLIPPER.

Three miles above Langley, Va., near the Potomac, in a ravine called Dead Run (Dr. G. W. Hill, May 15, 1881). Intermediate forms connecting this with the next have been met with in Woodley Park, also at Broadwater.

† *Cypripedium pubescens*, Willd. LARGE YELLOW MOCCASIN FLOWER or LADY'S SLIPPER.

Woodley; Corcoran's Woods. Not common. May.

† *Cypripedium acaule*, Ait. STEMLESS MOCCASIN FLOWER or LADY'S SLIPPER.

First half of May.

AMARYLLIDACEÆ.

AMARYLLIS FAMILY.

† *Hypoxys erecta*, L. STAR-GRASS.

Said to fruit sparingly, but my specimens generally show well-developed capsules and seeds. June.

HÆMODORACEÆ.

BLOODWORT FAMILY.

† *Aletris farinosa*, L. COLIC-ROOT.

Abundant at Falls Church (Professor Chickering); Reform School (rare). May. June.

IRIDACEÆ.

IRIS FAMILY.

Iris versicolor, L. BLUE FLAG.

May.

Iris verna, L. SPRING IRIS. DWARF IRIS.

Near Bladeusburg. First half of May.

† *Iris cristata*, Ait. CRESTED DWARF IRIS. LADIES' CALAMAS.

Spout Run, Va., near the "Three Sisters"; High Island. Second week in May.

Pardanthus Chinensis, Ker. BLACKBERRY-LILY.

July; fruit, October.

† *Sisyrinchium anceps*, L. (See Proc. Am. Acad., vol. xxii, p. 277.) BLUE-EYED GRASS.

April, May.

† *Sisyrinchium mucronatum*, Michx. (See Proc. Am. Acad., vol. xxii, p. 277.)

First of May.

DIOSCOREACEÆ.

YAM FAMILY.

† *Dioscorea villosa*, L. WILD YAM-ROOT.

First half of May.

SMILACEÆ.

SMILAX FAMILY.

† *Smilax rotundifolia*, L. GREENBRIER. CATBRIER.

First half of May.

† *Smilax glauca*, Walt.

Middle of May.

Smilax hispida, Muhl.

Last of May or first of June.

† *Smilax Pseudo-China*, L.

Many large vines appear to be wholly without flowers or fruit. Large tubers as light as cork with long, black roots projecting from them, curiously suggestive of huge spiders, were found along the Sligo Creek, washed out of the banks where the vines grow. Last week in May; fruit in July.

† *Smilax herbacea*, L. CARRION-FLOWER.

Last half of May.

Smilax tamnifolia, Michx.

May.

LILIACEÆ.

LILY FAMILY.

Allium tricoccum, Ait. LEEK.

High Islands, and islands above. First of July; fruit, September.

Allium cernuum, Roth. WILD ONION.

In the bud and early flower, the whole upper part of the stem droops; as the plant matures this curvature is gradually converted into a short turn at the summit, or proper nodding. First of July.

Allium Canadense, Kalm. WILD GARLIC.

June.

† *Allium vineale*, L. FIELD GARLIC.

June, July.

†*Polygonatum biflorum*, Ell. SMALLER SOLOMON'S SEAL.

Middle of May.

Polygonatum giganteum, Dietrich. GREAT SOLOMON'S SEAL.

Middle of May.

†*Smilacina racemosa*, Desf. FALSE SPIKENARD.

Last half of May.

†*Smilacina stellata*, Desf.

Found on High Island May 17, 1874, in flower; not seen there since. Mouth of Difficult Run, July 5, 1879, in fruit. Of the many plants seen at this last date, one berry, and only one, was found on each plant; no others appeared to have matured.

†*Maianthemum Canadense*, Desf. (See Proc. Am. Acad., vol. xiv, p. 246.) [*Smilacina bifolia*, Ker., var. *Canadensis*, Gray.]

Carroll Estate; rare. Said to have been formerly found on Piney Branch. Middle of May.

Asparagus officinalis, L.

Escaped from cultivation. June.

†*Lilium superbum*, L. TURK'S-CAP LILY.

Last week in July.

†*Erythronium Americanum*, Smith. YELLOW ADDER'S TONGUE.

First half of April.

Erythronium albidum, Nutt. WHITE DOG'S-TOOTH VIOLET.

High Island and above. First half of April.

†*Uvularia perfoliata*, L. BELLWORT.

First week in May.

†*Oakesia sessilifolia*, Watson. Proc. Am. Acad., vol. xiv, p. 269. [*Uvularia sessilifolia*, L.] SESSILE-LEAVED BELLWORT.

Last of April or first of May.

†*Medeola Virginica*, L. INDIAN CUCUMBER.

Upper, and sometimes lower whorl of leaves colored brilliant crimson at fruiting-time (to attract birds?). Last of May; fruit, end of September.

Trillium sessile, L. THREE-LEAVED NIGHTSHADE.

High Island and above. April; fruit in July.

†*Melanthium Virginicum*, L. BUNCH-FLOWER. BLACK FLOWER.

Reform School; Woodley Park. Third week in July.

†*Veratrum viride*, Ait. AMERICAN WHITE HELLEBORE.

Rock Creek; Falls Church. Not common. Third week in May.

†*Stenanthium robustum*, Watson. Proc. Am. Acad., vol. xiv, p. 278.

Near Bladensburg, July 20, 1879.

†*Chamæliirium Carolinianum*, Willd. [*C. luteum*, Gray.] DEVIL'S-BIT. BLAZING STAR.

Many of the plants sterile, having rosettes of leaves only; these persist throughout the winter unless very severe. End of May.

Tofieldia pubens, Pers. FALSE ASPHODEL.

Dr. Foreman reports having found this plant many years ago in the Holmead Swamp. Though apparently no longer there, it may be looked for in similar situations.

Ornithogalum umbellatum, L. STAR-OF-BETHLEHEM.

Last week in May.

Muscari botryoides, Mill. GRAPE-HYACINTH.

Falls Church Road. End of April.

Hemerocallis fulva, L. DAY-LILY.

Last of June or first of July.

JUNCACEÆ.

RUSH FAMILY.

† **Luzula campestris**, DC. WOOD-RUSH.

March.

† **Juncus effusus**, L. COMMON RUSH. SOFT RUSH.

June.

Juncus tenuis, Willd. GRASS-LEAVED RUSH.

June.

Juncus tenuis, Willd., var. **secundus**, Eng.

June.

Juncus dichotomus, Ell.

Last of May.

Juncus Gerardi, Lois.

Alexandria, Va. (Dr. Vasey).

Juncus bufonius, L.

Insane Asylum. Last of May or first of June.

† **Juncus marginatus**, Rostk.

July, August.

Juncus marginatus, Rostk., var. **vulgaris**, Eng.

June, July.

Juncus marginatus, Rostk., var. **biflorus**, Eng.

A slender form, 30^{cm} high, occurs; also the large form. June, July.

Juncus acuminatus, Michx., var. **legitimus**, Eng. [*J. pallescens*, L.] KNOTTY-LEAVED RUSH.

Strongly proliferous. June, July.

Juncus scirpoides, Lam., var. **macrostemon**, Eng.

August.

Juncus nodosus, L., var. **megacephalus**, Eng.

Flats above the Outlet Lock. August.

Juncus Canadensis, Gay, var. *subcaudatus*, Eng.

October.

Juncus Canadensis, Gay, var. *longicaudatus*, Eng.

August to October.

PONTEDERACEÆ.

PICKEREL-WEED FAMILY.

† *Pontederia cordata*, L. PICKEREL-WEED.

June to August.

† *Heteranthera reniformis*, Ruiz & Pav. MUD-PLANTAIN.

August, September.

† *Schollera graminea*, Willd. WATER STAR-GRASS. YELLOW-EYED WATER-GRASS.

July.

COMMELYNACEÆ.

SPIDERWORT FAMILY.

Commelyna erecta, L. DAY-FLOWER.

September.

† *Commelyna Virginica*, L. COMMON DAY-FLOWER.

High Island. July.

† *Tradescantia Virginica*, L. SPIDERWORT.

First half of May.

XYRIDACEÆ.

YELLOW-EYED GRASS FAMILY.

Xyris flexuosa, Muhl. YELLOW-EYED GRASS. YELLOW FLOWERING RUSH.

Railroad cutting near the Reform School (Professor Chickering); Holmead Swamp. Last half of July.

ERIOCAULONACEÆ.

PIPEWORT FAMILY.

Eriocaulon decangulare, L. PIPEWORT.

This plant has been erroneously distributed by me under the name of *E. gnaphalodes*, Michx. July.

CYPERACEÆ.

SEDGE FAMILY.

Cyperus diandrus, Torr. GALINGALE. CYPRUS GRASS.

August, September.

Cyperus diandrus, var. *castaneus*, Torr.

September.

Cyperus Nuttallii, Torr.

Achenia ash-colored and pitted. Telegraph Road near Bladensburg, October 13, 1878.

Cyperus erythrorhizos, Muhl.

Custis Spring, September 29, 1878.

Cyperus virens, Michx.

Flats below Eads' Mill. First half of August.

Cyperus phymatodes, Muhl.

This species invades the city and springs up in lawns, parks, &c., where the ground is somewhat moist. July to September.

† **Cyperus strigosus**, L.

Common. A depauperate form with very short (4^{mm}), one to few flowered spikes probably belongs to this species. August, September.

Cyperus Michauxianus, Schultes.

Custis Spring. September 29, 1878.

† **Cyperus filiculmis**, Vahl.

June to August.

Cyperus Lancastriensis, Porter.

Well defined forms of this species occur, but also several aberrant forms, apparently connecting it with *C. retroflexus*. July to September.

† **Cyperus ovularis**, Torr. HEDGE-HOG CLUB-RUSH.

July to September.

† **Cyperus retrofractus**, Torr.

Varies greatly in the length and size of the spikes, and perhaps the large-spiked forms should all be referred to *C. Lancastriensis*. July to September.

† **Dulichium spathaceum**, Pers.

Last half of July.

† **Fuirena squarrosa**, Michx. UMBRELLA-GRASS.

Holmead Swamp. July, August.

† **Eleocharis quadrangulata**, R. Br. SPIKE-RUSH.

Eastern Branch opposite the Race Course. July, August.

† **Eleocharis obtusa**, Schultes.

Spikes variable in size. May to July.

Eleocharis palustris, R. Br.

May.

Eleocharis compressa, Sulliv.

Little Falls; Great Falls; in damp, rocky places. The descriptions of this species in the fourth and fifth editions of Gray's Manual differ in some essential respects, and our plant agrees better with the former. The achenium is triangular-obovate and conspicuously pitted with oblong depressions longitudinally arranged. Stigmas often 3. It seems to be intermediate between *E. compressa* and *E. rostellata*. Middle to end of May.

† **Eleocharis tenuis**, Schultes.

First half of May.

Eleocharis acicularis, R. Br.

Bottom of dried ponds. June, July.

† *Scirpus planitolius*, Muhl.

Kalorama Heights, also near the East Corner of the District. Last half of May.

Scirpus pungens, Vahl.

Shores of the Potomac, between tides. Culms often twisted. June, July.

Scirpus validus, Vahl. GREAT BULRUSH. TULE.

June, July.

Scirpus debilis, Pursh.

Terra Cotta; also on the Flats below Chain Bridge. Middle of September.

Scirpus fluviatilis, Gray. RIVER CLUB-RUSH.

July.

Scirpus sylvaticus, L. WOOD CLUB-RUSH.

Anacostia Road above Uniontown (Dr. Vasey, 1881). Last half of July.

† *Scirpus atrovirens*, Muhl. CLUB-RUSH.

July.

Scirpus polyphyllus, Vahl.

June, July.

Scirpus lineatus, Michx.

June.

† *Scirpus Eriophorum*, Michx. WOOL-GRASS. CLUMP-HEAD GRASS.

August.

† *Eriophorum Virginicum*, L. COTTON-GRASS.

Terra Cotta Swamp. August; fruit, end of September.

Fimbristylis autumnalis, Roem. & Schultes.

July to September.

Fimbristylis capillaris, Gray.

Reform School. September 15, 1878 (late).

Rhynchospora alba, Vahl. BEAK-RUSH.

Holmead Swamp. July, August.

† *Rhynchospora glomerata*, Vahl.

July.

Scleria triglomerata, Vahl. NUT-RUSH.

Near the Agricultural College, Md. (Dr. Vasey).

Scleria oligantha, Ell.

Rock Creek above Davis's Quarry: June 1874 (Dr. Vasey).

Scleria pauciflora, Muhl.

Rock Creek above Davis's Quarry (Dr. Vasey); near the crossing of the Bennings Road and the Anacostia Road. May, June.

Carex polytrichoides, Muhl. SEDGE.

June.

Carex Willdenovii, Schk.

Middle of May to middle of June.

Carex Steudelii, Kunth.

High Island. Last week in May.

Carex bromoides, Schk.

Long Bridge (Dr. Vasey).

Carex decomposita, Muhl.

In a "water-pocket" of a rock near the Potomac above Sandy Landing, on the Maryland side, May 22, 1881; then rather young.

Carex vulpinoidea, Michx.

Last of May or first of June.

† **Carex stipata**, Muhl.

Third week in May.

Carex sparganioides, Muhl.

Little Falls (Dr. Vasey).

Carex cephalophora, Muhl.

Last half of May.

Carex cephalophora, Muhl., var. *angustifolia*, Boott.

Woodley Park. End of May.

Carex Muhlenbergii, Schk.

Last of May or first of June.

Carex rosea, Schk.

Last of May.

Carex rosea, Schk., var. *minor*, Boott.

Last of May.

Carex stellulata, L.

Last of May.

Carex scoparia, Schk.

Middle of June.

Carex lagopodioides, Schk.

Last of June.

Carex cristata, Schw.

Potomac City, July 14, 1878.

Carex foenea, Willd.

Hunting Creek (Dr. Vasey).

Carex straminea, Schk.

First half of June.

Carex straminea, Schk., var. *tenera*, Boott.

Not rare (Dr. Vasey).

Carex straminea, Schk., var. **aperta**, Boott.

Common (Dr. Vasey).

Carex vulgaris, Fries.

Chain Bridge (Dr. Vasey, May 22, 1881.)

Carex torta, Boott.

Broad Branch, (Dr. Vasey); Virginia shore of the Potomac above Rosslyn. Last half of May.

Carex angustata, Boott. [*C. stricta*, Lam.] TUSsock SEDGE.

Middle of May.

† **Carex crinita**, Lam.

First half of July.

Carex gynandra, Schw.

June.

Carex Shortiana, Dew.

First half of May.

Carex tetanica, Schk.

Oxen Run; High Island. Last half of May.

Carex tetanica, Schk., var. **Woodii**, Olney.

Very peculiar in habit. Insane Asylum; Rock Creek, opposite Brightwood. Last of May or first of June.

† **Carex granularis**, Muhl.

Last week in May.

Carex glaucoidea, Porter.

Rock Creek (Dr. Vasey).

Carex pallescens, L.

Spikes mostly 4, with staminate flowers at the apex. Last of May or first of June.

Carex pallescens, L., var. **undulata**, Gray.

Insane Asylum. First of June.

Carex grisea, Wahl.

A large and a small form, the latter of which is probably the var. *angustifolia*, Boott. May.

Carex gracillima, Schw.

Back Lick Run; Corcoran's Woods. First half of May.

† **Carex virescens**, Muhl.

Last of May or first of June.

Carex virescens, Muhl., var. **elliptica**, Olney.

First half of June.

Carex triceps, Michx.

A form occurs with staminate flowers at the apex of the spikes. First half of June.

Carex platyphylla, Carey.

Last of April or first of May.

Carex Careyana, Torr.

Dead Run, three miles above Langley, Va. (Dr. Vasey, May 15, 1881).

Carex retrocurva, Dew.

Rock Creek (Dr. Vasey).

Carex digitalis, Willd.

Last of May or first of June.

† **Carex laxiflora**, Lam.

Last half of May.

Carex laxiflora, Lam., var. **styloflexa**, Boott.

Last half of May.

Carex laxiflora, Lam., var. **plantaginea**, Boott.

Last half of May.

Carex laxiflora, Lam., var. **intermedia**, Boott.

Last half of May.

Carex laxiflora, Lam., var. **blanda**, Sulliv.

Last half of May.

Carex laxiflora, Lam., var. **gracillima**, Boott.

Middle of May.

Carex Hitchcockiana, Dew.

Last half of May.

Carex oligocarpa, Schk.

First half of June.

Carex umbellata, Schk.

In crevices of rocks, top of High Island; rare. Affected with a blight. Last half of April.

Carex Emmonsii, Dew.

Last of April or first of May.

Carex nigro-marginata, Schw.

East of Fort Mahan (Dr. Vasey); above Bladensburg (Professor Chickering).

† **Carex Pennsylvanica**, Lam.

May.

† **Carex varia**, Muhl.

Dry Hills, Rock Creek, &c. (Dr. Vasey).

† **Carex pubescens**, Muhl.

High Island. Last week in May.

† **Carex miliacea**, Muhl.

Middle to end of May.

Carex debilis, Michx.

Last week in May to middle of June.

Bull. Nat. Mus. No. 22—9

Carex vestita, Willd.

Sligo Creek; Bladensburg. Middle of May.

† **Carex riparia**, Curtis.

Eastern Branch Marsh. Last of May or first of June.

Carex comosa, Boott.

Last half of May.

Carex Pseudo-Cyperus, L.

Swamps, Rock Creek Region (Dr. Vasey).

Carex hystricina, Willd.

Flats of the Potomac below Chain Bridge, June 5, 1881; then in good condition.
Plant deep green.

† **Carex tentaculata**, Muhl.

Bracts conspicuously sheathing. Spikes not sessile, the lower sometimes on long stalks 8^{cm} or 10^{cm} long; perigynia 8^{mm} to 10^{mm} long. The typical form has not been found. I collected a remarkably etiolated state of this on the Eastern Branch Marsh (see p. 33). Last of May or in June.

Carex intumescens, Rudge.

End of May.

† **Carex lupulina**, Muhl.

Last half of May.

Carex folliculata, L.

Last half of May.

† **Carex squarrosa**, L.

Last of May or in June.

Carex stenolepis, Torr.

June.

Carex bullata, Schk.

Meadow near the Anacostia Road and Beaver Dam Branch; also, Reform School.
Last half of June and to middle of July.

GRAMINEÆ.

GRASS FAMILY.

† **Leersia Virginica**, Willd. WHITE GRASS.

August.

† **Leersia oryzoides**, Swartz. RICE CUT-GRASS.

August, September.

† **Zizania aquatica**, L. INDIAN RICE. WATER OATS.

August, September.

Alopecurus geniculatus, L. FLOATING FOXTAIL GRASS.

Marsh at mouth of Hunting Creek. Middle of May to middle of June.

- Alopecurus geniculatus**, L., var. **aristulatus**, Steud. *Synopsis Plantarum glumacearum*, 147, 5. [*A. aristulatus*, Michx.] WILD FOXTAIL GRASS.
- † **Phleum pratense**, L. TIMOTHY. HERD'S-GRASS (of New England).
June.
- Vilfa aspera**, Beauv. RUSH-GRASS.
Little Falls (Dr. Vasey, 1874).
- Agrostis perennans**, Tuckerm. THIN GRASS.
August, September.
- Agrostis scabra**, Willd. HAIR-GRASS.
Last of May or first of June.
- Agrostis vulgaris**, With. RED-TOP. HERD'S-GRASS (of Pennsylvania).
Middle of June to middle of July.
- Agrostis alba**, L. FIORIN. WHITE BENT-GRASS.
Last of June and through July.
- Cinna arundinacea**, L. WOOD REED-GRASS.
August, September.
- Muhlenbergia sobolifera**, Trin. DROP-SEED GRASS.
Rocky Woods, not rare (Dr. Vasey).
- Muhlenbergia Mexicana**, Trin.
September.
- Muhlenbergia sylvatica**, Torr. & Gray.
September.
- Muhlenbergia Willdenovii**, Trin.
July, August.
- Muhlenbergia diffusa**, Schreb. NIMBLE-WILL.
September.
- Muhlenbergia capillaris**, Kunth. HAIR-GRASS.
Once found, September 26, 1875, at Great Falls; not seen since.
- Brachyelytrum aristatum**, Beauv.
Last of July or first of August.
- Calamagrostis Nuttalliana**, Steud. REED BENT-GRASS.
First half of September.
- Stipa avenacea**, L. BLACK OAT-GRASS.
Last of May or first of June.
- Aristida dichotoma**, Michx. TRIPLE-AWNED GRASS. POVERTY-GRASS.
Sandy places (Dr. Vasey).
- † **Aristida gracilis**, Ell.
Last of September or first of October.
- Aristida oligantha**, Michx.
Last of September.

Aristida purpurascens, Poir.

Little Falls (Dr. Vasey).

Spartina cynosuroides, Willd. FRESH-WATER CORD-GRASS.

Flats under Chain Bridge. August.

Gymnopogon racemosus, Beauv. NAKED-BEARD GRASS.

Last half of September.

Cynodon Dactylon, Pers. BERMUDA-GRASS. SCUTCH-GRASS.

All my efforts to find developed grains have thus far proved unavailing. July.

†**Eleusine Indica**, Gaertn. CRAB-GRASS. YARD-GRASS.

July.

Tricuspis seslerioides, Torr. TALL RED-TOP.

August.

†**Dactylis glomerata**, L. ORCHARD-GRASS.

Middle of May.

Eatonia Pennsylvanica, Gray.

Varies much in appearance, there being a wood-form with slender culms and very short upper leaves, and a meadow-form much taller and stouter, with the panicle partly included and upper leaves flat, 5^{mm} wide and nearly a decimeter in length.

Last half of May.

Melica mutica, Walt. MELIC-GRASS.

Last of April or first of May.

Glyceria nervata, Trin. MANNA GRASS. FOWL MEADOW-GRASS.

Last of May.

Glyceria aquatica, Smith. REED MEADOW-GRASS.

Terra Cotta Swamp. Last of June or first of July.

Glyceria fluitans, R. Br.

Broadwater; found only in one of the many pools among rocks. July 6, 1879, late; should be collected in June.

†**Poa annua**, L. LOW SPEAR-GRASS.

Last of April or first May.

†**Poa compressa**, L. WIRE-GRASS.

Last of May or first of June.

Poa compressa, L., var. *gracilis* (Oakes?).

Habit very unlike that of the type, and more certainly indigenous. First half of June.

†**Poa pratensis**, L. COMMON MEADOW-GRASS. KENTUCKY BLUE GRASS.

Middle to end of May.

Poa trivialis, L. ROUGHISH MEADOW-GRASS.

Last half of May.

Poa sylvestris, Gray.

Last half of May.

Poa flexuosa, Muhl.

First half of May.

Poa brevifolia, Muhl.

March or early in April.

Eragrostis reptans, Nees.

Islands of the Potomac. July, August.

Eragrostis poaeoides, Beauv.

Rare. July.

Eragrostis poaeoides, Beauv., var. *megastachya*, Gray.

In the city. July.

Eragrostis Frankii, Meyer.

Little Falls, rare. September.

Eragrostis Purshii, Schrad. (?)

Abundant in the city, and apparently introduced. Dr. Vasey thinks this is *E. Purshii*, and so it must be if the acute 3-nerved flowering glume is characteristic of that species, but our plant is often only 12^{cm} to 15^{cm} high, and the spikelets are generally as long as or longer than their pedicels. I am strongly inclined to believe that it is a form of *E. pilosa*. July.

Eragrostis capillaris, Nees.

August, September.

†**Eragrostis pectinacea**, Gray.

July to September.

Festuca Myurus, L. FESCUE-GRASS.

Last half of May.

†**Festuca tenella**, Willd.

First half of June.

Festuca ovina, L. SHEEP'S FESCUE.

Waste places in the city (Dr. Vasey).

Festuca elatior, L. TALLER FESCUE. MEADOW-FESCUE.

Waste grounds in the city. First half of June.

Festuca nutans, Willd.

Last half of May.

Bromus secalinus, L. CHESS. CHEAT.

Middle of May to middle of June.

Bromus racemosus, L. UPRIGHT CHESS.

Last of May.

Bromus mollis, L. SOFT CHESS.

This and the last are scarcely distinct, while intermediate forms seem to connect them with *B. secalinus*. Last half of May.

Bromus ciliatus, L.

Last of May or first of June.

Bromus ciliatus, L., var. **purgans**, Gray.

June.

Bromus sterilis, L.

Anacostia Road above Uniontown, rare. Collected only July 8, 1877, then rather advanced.

† **Uniola latifolia**, Michx. SPIKE-GRASS.

Bluffs of the Potomac. Last of July or in August.

Uniola gracilis, Michx.

Reform School. Last of July or first of August.

† **Lolium perenne**, L. DARNEL. RAY-GRASS. RYE-GRASS.

Last of May or first of June.

Triticum repens, L. COUCH-GRASS. QUITCH-GRASS. QUICK-GRASS.

Last of May.

Elymus Virginicus, L. LYME-GRASS. WILD RYE.

July, August.

Elymus Canadensis, L.

August, September.

Elymus striatus, Willd.

First of July.

Elymus striatus, Willd., var. **villosus**, Gray.

High Island. First half of July.

Gymnostichum Hystrix, Schreb. BOTTLE-BRUSH GRASS.

June.

Danthonia spicata, Beauv. WILD OAT-GRASS.

Middle of May to Middle of June.

† **Trisetum palustre**, Torr.

Not common. Last half of May.

Aira flexuosa, L. COMMON HAIR-GRASS.

Often nearly a meter in height. Last of May.

Aira caryophylla, L.

Common in the eastern districts. First half of May.

Holcus lanatus, L. VELVET-GRASS.

June.

† **Anthoxanthum odoratum**, L. SWEET VERNAL GRASS.

First half of May.

Phalaris Canariensis, L. CANARY-GRASS.

Sparingly springing up from refuse heaps in the city. June, July.

† **Paspalum setaceum**, Michx.

August, September.

Paspalum læve, Michx.

August.

***Panicum filiforme*, L. PANIC-GRASS.**

September.

† ***Panicum sanguinale*, L. CRAB-GRASS. CROP-GRASS. FINGER-GRASS.**

July.

***Panicum anceps*, Michx.**

Dry ground; panicle loose; light colored; spikelets $3\frac{1}{2}$ mm long; fertile flower 2mm long; bristles at the apex of the flowering glume 5 or 6, crowded. Last of September or first of October.

***Panicum agrostoides*, Spreng.**

Moist ground; sheaths smooth; spikelets 2 $\frac{1}{2}$ mm long. A few conical bristles project from the blunt apex of the flowering glume of the fertile flower, at some distance from the incurved margin. These are often reduced to 2 or 3, well separated from each other. Panicle very dense, purple. Culms flat; fertile flowers 1mm long, lanceolate or linear. Last of September or first of October.

***Panicum proliferum*, Lam.**

Not common. Late in September.

† ***Panicum capillare*, L. OLD-WITCH GRASS.**

August.

***Panicum virgatum*, L.**

July, August.

† ***Panicum latifolium*, L.**

End of May.

***Panicum latifolium*, L., var. *molle*, Vasey, n. v.**

This variety is soft-velvety throughout and especially on the sheaths and under surface of the leaves; even the culms below the joints are downy, and the joints themselves are bearded with long and very soft white hairs. The flowers are triandrous and purplish. End of May.

***Panicum clandestinum*, L.**

Forms with small heads occur uniting this with wide-leaved states of *P. dichotomum*. June.

***Panicum microcarpon*, Muhl.**

The late flowering-time of this species is a convenient means of distinguishing it from any of the broad-leaved forms of *P. dichotomum*. July.

***Panicum viscidum*, Ell.**

Reform School. Last half of July.

***Panicum pauciflorum*, Ell.**

High Island. May 25, 1879.

***Panicum dichotomum*, L.**

I distinguished twelve well-marked forms, probably embracing several good species.

Dr. Vasey has kindly given this species a special study expressly for this work, and chiefly from specimens furnished him from this locality by myself or of his own collection, and he makes the following report upon it:

"It is very difficult to classify the varieties of this polymorphous species. So far as our forms are concerned, they may be grouped as follows:

"1st. Those with narrow leaves, small panicles, and small flowers, including the varieties *nitidum*, *barbulatum*, and *ciliatum*, say, *Microcarpæ*.

"2d. Those of a larger or stronger growth, with broader leaves and ampler panicles, with flowers generally somewhat larger. This includes what has been called *P. sphaerocarpon*, Ell., and *P. laxiflorum*, Lam.

"3d. A still larger form, with leaves broader and more rigid, and spikelets larger, approaching some forms of *P. latifolium* (perhaps *P. nervosum*, Ell.), and which probably should be considered a distinct species, or a variety of *P. latifolium*."

A comparison of the Panicums of this group shows that the species which tend most strongly to coalesce are *P. latifolium*, *P. clandestinum*, and *P. dichotomum*. These, with perhaps *P. microcarpon*, seem to constitute one large polymorphous species.

Middle of May to September, but chiefly in June.

***Panicum depauperatum*, Muhl.**

June.

***Panicum verrucosum*, Muhl.**

Not common. September.

† ***Panicum Crus-galli*, L. BARNYARD-GRASS.**

July.

***Panicum Crus-galli*, L., var. *hispidum*, Gray.**

Custis Spring. Apparently indigenous. August.

***Setaria verticillata*, Beauv. BRISTLY FOXTAIL GRASS.**

Waste lots in the city (Dr. Vasey).

† ***Setaria glauca*, Beauv. FOXTAIL.**

July, August.

***Setaria viridis*, Beauv. GREEN FOXTAIL. BOTTLE-GRASS.**

July, August.

***Cenchrus tribuloides*, L. BUR-GRASS. HEDGEHOG-GRASS.**

Reform School. Not common.

† ***Tripsacum dactyloides*, L. GAMA-GRASS. SESAME-GRASS.**

Along the Potomac. Not abundant. July.

***Erianthus alopecuroides*, Ell. WOOLLY BEARD-GRASS.**

Holmead Swamp; Terra Cotta. August, September.

† ***Andropogon furcatus*, Muhl. BEARD-GRASS.**

August, September.

***Andropogon scoparius*, Michx.**

September.

***Andropogon argenteus*, Ell.**

September, October.

***Andropogon Virginicus*, L. BROOM-SAGE.**

September, October.

***Andropogon macrourus*, Michx.**

Marlboro' Road; Sligo Creek. September, October.

***Sorghum nutans*, Gray. INDIAN GRASS. WOOD-GRASS.**

August, September.

GYMNOSPERMS.

CONIFERÆ.

PINE FAMILY.

† *Juniperus Virginiana*, L. RED CEDAR. SAVIN.

Male aments in April.

† *Pinus rigida*, Miller. PITCH PINE.

This species well illustrates the persistence of cones. On March 26, 1876, I made observations on a large tree recently blown down in the vicinity of the Blair Road and Sligo Creek. Cones in a good state of preservation were still adherent to the trunk of the tree $4\frac{1}{2}$ meters from the top, where it had a girth of half a meter. As these cones were developed from the branches of the season, this affords some idea of the length of time since the part of the tree to which they adhered constituted its summit. Aments in May.

Pinus pungens, Michx. TABLE MOUNTAIN PINE.

Near Rock Creek, opposite Crystal Spring. Some dozen fine trees.

† *Pinus inops*, Ait. SCRUB PINE. JERSEY PINE.

Aments, end of April or first of May.

† *Pinus mitis*, Michx. YELLOW PINE.

Aments, middle of May.

† *Pinus Strobus*, L. WHITE PINE.

Aments, middle of May.

Tsuga Canadensis, Carrière. [*Abies Canadensis*, Michx.] HEMLOCK SPRUCE.

Bluffs below Great Falls, Va.

CRYPTOGAMIA.

VASCULAR CRYPTOGRAMIA.

EQUISETACEÆ.

HORSETAIL FAMILY.

† *Equisetum arvense*, L. COMMON HORSETAIL.

Last week in April.

† *Equisetum hyemale*, L. SCOURING RUSH. SHAVE-GRASS.

Common. A very large form, a meter in height, was found in a ravine above the Receiving Reservoir, with spikes already formed, on the 17th of February, 1878. June.

FILICES.

FERNS.

† *Polypodium vulgare*, L. COMMON POLYPODY.

† *Cheilanthes vestita*, Swartz. HAIRY LIP-FERN. CLOTHED LIP-FERN.

Great Falls; Chain Bridge.

- † *Pellæa atropurpurea*, Link. DARK PURPLE ROCK-BRAKE. CLAYTON'S CLIFF-BRAKE.
Georgetown (Professor Chickering); Alexandria (Dr. Vasey); Great Falls.
- † *Pteris aquilina*, L. BRAKE. BRACKEN. EAGLE-FERN.
May, June.
- † *Adiantum pedatum*, L. AMERICAN MAIDEN-HAIR.
Last of May.
- † *Woodwardia angustifolia*, Smith. NETTED CHAIN-FERN.
August, September.
- Woodwardia Virginica*, Smith. COMMON CHAIN-FERN. VIRGINIA CHAIN-FERN.
Terra Cotta Swamp. July, August.
- † *Asplenium Trichomanes*, L. ENGLISH MAIDEN-HAIR. DWARF SPLEENWORT. MAIDEN-HAIR SPLEENWORT.
Remarkable circumnutations of the fronds of this plant were discovered in 1879 by Professor E. J. Loomis, of Washington.
- † *Asplenium ebeneum*, Ait. EBONY SPLEENWORT.
June.
- † *Asplenium angustifolium*, Michx. NARROW-LEAVED SPLEENWORT.
This plant was formerly found by Dr. Foreman and others on High Island, but has not been seen there for many years. Mr. O. M. Bryan has, however, recently found it at Marshall Hall, opposite Mount Vernon, and specimens of his collecting there have been seen by Dr. Foreman, who vouches for their authenticity. Mr. William Palmer has seen it growing abundantly at Seneca, Md., but this alone would not entitle it to admission to this catalogue.
- † *Asplenium thelypteroides*, Michx. SILVERY SPLEENWORT.
July.
- Asplenium Filix-fœmina*, Bernh. LADY-FERN.
July.
- Camptosorus rhizophyllus*, Link. WALKING FERN. WALKING LEAF.
Cabin John Run. Discovered by Dr. Frank Baker.
- Phegopteris hexagonoptera*, Fee. HEXAGON BEECH-FERN.
June, July.
- Aspidium Noveboracense*, Swartz. NEW YORK SHIELD-FERN.
July.
- Aspidium Thelypteris*, Swartz. MARSH SHIELD-FERN.
July, August.
- Aspidium cristatum*, Swartz. CRESTED SHIELD-FERN. CRESTED WOOD-FERN.
Carroll Estate. Sterile fronds only thus far found.
- Aspidium Goldianum*, Hook. GOLDIE'S WOOD-FERN.
Collected by Dr. Vasey and myself near the Conduit Road below Cabin John Run, July 4, 1880.
- Aspidium Filix-mas*, Swartz. MALE FERN.
Not common. September, October.

Aspidium marginale, Swartz. EVERGREEN WOOD-FERN.

September, October.

Aspidium spinulosum, Swartz, var. **intermedium**, Willd. COMMON WOOD-FERN.

September, October.

† **Aspidium acrostichoides**, Swartz. CHRISTMAS FERN. CHRISTMAS SHIELD-FERN.

September, October.

Cystopteris fragilis, Bernh. BRITTLE FERN.

High Island. July.

† **Onoclea sensibilis**, L. SENSITIVE FERN.

Last of May or in June.

Woodsia obtusa, Torr. OBTUSE-LEAVED WOODSIA.

End of May or in June.

Dicksonia pilosiuscula, Willd. [*D. punctilobula*, Kunze.] HAY-SCENTED FERN.
HAIRY DICKSONIA.

June.

Lygodium palmatum, Swartz. CLIMBING FERN. HARTFORD-FERN.

Thus far found only in one little swamp near the Sligo; in fruit October 12, 1879.

This plant is annually brought into the Washington markets from some point in Maryland not yet discovered by botanists.

Osmunda regalis, L. ROYAL FERN. FLOWERING FERN.

June.

Osmunda Claytoniana, L. CLAYTON'S FLOWERING FERN.

July.

† **Osmunda cinnamomea**, L. CINNAMON FERN.

Last of May or first of June.

OPHIOGLOSSACEÆ.

ADDER'S-TONGUE FAMILY.

† **Botrychium ternatum**, Swartz, var. **obliquum**, Milde. TERNATE GRAPE-FERN.

September to November; found in fine condition November 16, 1873. The brown fronds persist through the hardest winters.

† **Botrychium ternatum**, Swartz, var. **dissectum**, Milde.

September to November; found as late as November 3, 1878.

† **Botrychium Virginianum**, Swartz. RATTLESNAKE GRAPE-FERN. VIRGINIAN GRAPE-FERN.

Last of May or first of June.

† **Ophioglossum vulgatum**, L. COMMON ADDER'S-TONGUE.

Locke's Branch of Rock Creek near Blagden's Mill (Mr. J. M. Comstock, 1875);
Bladensburg (Professor Chickering); Back Lick Run. May.

LYCOPODIACEÆ.

CLUB-MOSS FAMILY.

† **Lycopodium lucidulum**, Michx. CLUB-MOSS.

August.

†*Lycopodium dendroideum*, Michx. GROUND-PINE.

Not common. July to October.

Lycopodium complanatum, L. CROWFOOT.

September, October.

Lycopodium complanatum, L., var. *sabinæfolium*, Spring.

Two miles north of Bladensburg. In young fruit July 20, 1879.

Selaginella rupestris, Spring.

Great Falls. Specimens collected by Dr. Schott are in the herbarium of the Department of Agriculture. Not seen recently.

Selaginella apus, Spring.

Foundry Run (Dr. Vasey); Reform School. July.

CELLULAR CRYPTOGRAMIA.

MUSCI.

MOSSES.

The list of *Musci* and *Hepaticæ* which follows was prepared by the late Mr. Rudolph Oldberg for the *Flora Columbiana*, published in 1876. It is reproduced here almost wholly unchanged except that the habitat is omitted according to the general plan of this work, and a few changes have been made in the names and authorities as well as in the arrangement, to make it conform strictly to Sullivant's work.

Sphagnum cymbifolium, Dill.

Sphagnum squarrosum, Pers.

Sphagnum acutifolium, Ehrh.

Sphagnum cuspidatum, Ehrh.

Andræa rupestris, Turner.

Phascum sessile, Br. & Sch.

Phascum cohærens, Hedw.

Phascum triquetrum, Spruce.

Phascum cuspidatum, Schreb.

Phascum alternifolium, Brid.

Phascum subulatum, Schreb.

Phascum Sullivantii, Schimp.

Bruchia flexuosa, Schwaegr.

Weisia viridula, Brid.

Trematodon longicollis, Rich.

Dicranum varium, Hedw.

Dicranum heteromallum, Hedw.

Dicranum scoparium, L.

Ceratodon purpureus, Brid.

- Leucobryum glaucum*, Hampe.
Leucobryum minus, Hampe.
Fissidens minutulus, Sulliv.
Fissidens osmundioides, Hedw.
Trichostomum pallidum, Hedw.
Trichostomum glaucescens, Hedw.
Barbula unguiculata, Hedw.
Barbula caespitosa, Schwaegr.
Pottia truncata, Br. & Sch.
Tetraphis pellucida, Hedw.
Drummondia clavellata, Hook.
Orthotrichum Canadense, Br. & Sch.
Schistidium apocarpum, Br. & Sch.
Grimmia Pennsylvanica, Schwaegr.
Racomitrium fasciculare, Brid.
Hedwigia ciliata, Ehrh.
Diphyscium foliosum, Web. & Mohr.
Atrichum undulatum, Beauv.
Atrichum angustatum, Beauv.
Pogonatum brevicaulis, Brid.
Pogonatum urnigerum, Brid.
Polytrichum commune, L.
Polytrichum juniperinum, Hedw.
Aulacomnium heterostichum, Br. & Sch.
Bryum pyriforme, Hedw.
Bryum Wahlenbergii, Schwaegr.
Bryum argenteum, L.
Bryum pseudo-triquetrum, Schwaegr.
Bryum caespiticium, L.
Mnium stellare, Hedw.
Mnium Drummondii, Br. & Sch.
Mnium cuspidatum, Hedw.
Bartramia pomiformis, Hedw.
Bartramia fontana, Brid.
Funaria hygrometrica, Hedw.

- Physcomitrium pyriforme*, Br. & Sch.
Physcomitrium hians, Lind.
Fontinalis biformis, Sulliv.
Leucodon julaceus, Sulliv.
Dichelyma subulatum, Myrin.
Leptodon trichomitrium, Mohr.
Anomodon attenuatus, Hub.
Leskea obscura, Hedw.
Leskea rostrata, Hedw.
Thelia hirtella, (Hedw.) Sulliv.
Thelia asprella, (Schimp), Sulliv.
Pylaisæa intricata, Bryol. Europ.
Platygyrium repens, Bryol. Europ.
Cylindrothecium cladorrhizans, Bryol. Europ.
Cylindrothecium seductrix, Bryol. Europ.
Climacium Americanum, Brid.
Hypnum tamariscinum, Hedw.
Hypnum triquetrum, L.
Hypnum splendens, Hedw.
Hypnum hians, Hedw.
Hypnum Sullivantii, Spruce.
Hypnum strigosum, Hoffm.
Hypnum piliferum, Schreb.
Hypnum Boscii, Schwaegr.
Hypnum serrulatum, Hedw.
Hypnum deplanatum, Sch.
Hypnum rusciforme, Weis.
Hypnum recurvans, Schwaegr.
Hypnum Schreberi, Willd.
Hypnum stramineum, Dickson.
Hypnum uncinatum, Hedw.
Hypnum fluitans, L.
Hypnum cupressiforme, L.
Hypnum curvifolium, Hedw.
Hypnum pratense, Koch.

Hypnum salebrosum, Hoffm.
Hypnum lætum, Brid.
Hypnum hispidulum, Brid.
Hypnum radicale, Brid.
Hypnum orthocladon, Beauv.
Hypnum riparium, Hedw.
Hypnum Lescurii, Sulliv.
Hypnum fulvum, Hook. & Wils.
Hypnum sylvaticum, L.

HEPATICÆ.

LIVERWORTS.

Riccia lutescens, Schw.
Anthoceros punctatus, L.
Marchantia polymorpha, L.
Pegatella conica, Corda.
Metzgeria furcata, Nees.
Aneura palmata, Nees.
Steetzia Lyellii, Lehm.
Pellia epiphylla, Nees.
Geocalyx graveolens, Nees.
Chiloscyphus polyanthos, Corda.
Lophocolea bidentata, Nees.
Jungermannia trichophylla, L.
Jungermannia setacea, Weber.
Jungermannia connivens, Dickson.
Jungermannia Schraderi, Martius.
Scapania nemorosa, Nees.
Plagiochila spinulosa, Nees & Montagne.
Plagiochila asplenioides, Nees & Montagne
Frullania Grayana, Montagne.
Frullania Virginica, Lehm.
Frullania Eboracensis, Lehm.
Lejeunia cucullata, Nees.
Madotheca platyphylla, Dumort.
Radula complanata, Dumort.

Ptilidium ciliare, Nees.

Trichocolea tomentella, Nees.

Mastigobryum tridenticulatum, Lindenb.

Lepidozia reptans, Nees.

Calypogeia trichomanis, Corda.

CHARACEÆ.

The following species of this order have been collected by Dr. E. Foreman within our limits, who has referred them to Prof. W. G. Farlow for determination, and has kindly consented to their publication in this work:

Nitella flexilis, L.

Eastern Branch.

Nitella tenuissima, Desv.

Custis Spring.

Chara polyphylla, var. **Michauxii**, Al. Braun.

Carberry Meadows.

Chara hydropithys, Al. Braun.

Carberry Meadows.

XVI. SUMMARY.

Number.	Orders.	Genera.	Species.	Varieties.	Species and Varieties.	Introduced Plants.	Woody Plants.	Trees.
1	Ranunculaceæ.....	7	23	4	27	3		
2	Magnoliaceæ.....	2	2		2		2	2
3	Anonaceæ.....	1	1		1		1	1
4	Menispermaceæ.....	1	1		1		1	
5	Berberidaceæ.....	4	4		4	1	1	
6	Nymphæaceæ.....	3	3		3			
7	Sarraceniaceæ.....	1	1		1			
8	Papaveraceæ.....	3	3		3	2		
9	Fumariaceæ.....	3	3		3	1		
10	Cruciferae.....	16	33	1	34	15		
11	Cistaceæ.....	2	2		2			
12	Violaceæ.....	2	9	5	14			
13	Polygalaceæ.....	1	7		7			
14	Caryophyllaceæ.....	9	19		19	8		
15	Illecebraceæ.....	2	2	1	3			
16	Portulacaceæ.....	2	2		2	1		
17	Hypericaceæ.....	3	9		9	1	1	
18	Malvaceæ.....	4	7		7	5		
19	Tiliaceæ.....	1	1		1		1	1
20	Linaceæ.....	1	3		3	1		
21	Geraniaceæ.....	4	9		9	3		
22	Rutaceæ.....	2	2		2	1	2	
23	Ilicineæ.....	1	4		4		4	1
24	Celastraceæ.....	2	3	1	4		4	
25	Rhamnaceæ.....	1	2		2		2	
26	Vitaceæ.....	2	6		6		6	
27	Sapindaceæ.....	3	5		5		5	4
28	Anacardiaceæ.....	1	6		6		6	1
29	Leguminosæ.....	24	55	2	57	13	4	3
30	Rosaceæ.....	15	43	3	46	12	30	8
31	Saxifragaceæ.....	8	9		9	3	5	
32	Crassulaceæ.....	2	3		3			
33	Droseraceæ.....	1	1		1			
34	Hamamelaceæ.....	2	2		2		2	1
35	Haloragææ.....	3	3		3			
36	Melastomaceæ.....	1	1		1			
37	Lythraceæ.....	4	4		4			
38	Onagraceæ.....	6	10	1	11			
39	Passifloraceæ.....	1	2		2	1		
40	Cucurbitaceæ.....	1	1		1			
41	Cactaceæ.....	1	1		1			
42	Ficoideæ.....	1	1		1			
43	Umbelliferae.....	17	22		22	2		
44	Araliaceæ.....	1	4		4		1	1

XVI. SUMMARY—Continued.

Number.	Orders.	Genera.	Species.	Varieties.	Species and Varieties.	Introduced Plants.	Woody Plants.	Trees.
45	Cornaceæ.....	2	5	.....	5	.....	5	2
46	Caprifoliaceæ.....	5	12	.....	12	3	10	1
47	Rubiaceæ.....	5	12	1	13	.....	1	.....
48	Valerianaceæ.....	2	4	.....	4	1	.....	.....
49	Dipsacæ.....	1	1	.....	1	1	.....	.....
50	Compositæ.....	53	138	11	149	17	1	.....
51	Lobeliaceæ.....	1	5	.....	5	.....	.....	.....
52	Campanulaceæ.....	2	2	.....	2	.....	.....	.....
53	Ericaceæ.....	11	24	2	26	.....	17	2
54	Primulaceæ.....	5	8	2	10	2	.....	.....
55	Ebenaceæ.....	1	1	.....	1	.....	1	1
56	Oleaceæ.....	2	4	.....	4	.....	4	4
57	Apocynaceæ.....	2	2	1	3	1	.....	.....
58	Asclepiadaceæ.....	4	13	1	14	.....	.....	.....
59	Gentianaceæ.....	4	6	.....	6	.....	.....	.....
60	Polemoniaceæ.....	2	6	.....	6	.....	.....	.....
61	Hydrophyllaceæ.....	3	4	.....	4	.....	.....	.....
62	Borraginaceæ.....	7	12	.....	12	3	.....	.....
63	Convolvulaceæ.....	3	11	.....	11	4	.....	.....
64	Solanaceæ.....	5	8	.....	8	5	.....	.....
65	Scrophulariaceæ.....	15	32	.....	32	5	.....	.....
66	Orobanchaceæ.....	4	4	.....	4	1	.....	.....
67	Lentibulaceæ.....	1	2	.....	2	.....	.....	.....
68	Bignoniaceæ.....	2	2	.....	2	1	2	1
69	Acanthaceæ.....	2	3	1	4	.....	.....	.....
70	Verbenaceæ.....	3	6	.....	6	1	.....	.....
71	Labiata.....	23	41	1	42	10	.....	.....
72	Plantaginaceæ.....	1	5	1	6	2	.....	.....
73	Amarantaceæ.....	2	5	.....	5	4	.....	.....
74	Chenopodiaceæ.....	3	7	2	9	7	.....	.....
75	Phytolaccaceæ.....	1	1	.....	1	.....	.....	.....
76	Polygonaceæ.....	3	22	2	24	7	.....	.....
77	Podostemaceæ.....	1	1	.....	1	.....	.....	.....
78	Aristolochiaceæ.....	2	2	.....	2	.....	.....	.....
79	Piperaceæ.....	1	1	.....	1	.....	.....	.....
80	Lauraceæ.....	2	2	.....	2	.....	2	1
81	Thymeleaceæ.....	1	1	.....	1	.....	1	.....
82	Santalaceæ.....	1	1	.....	1	.....	.....	.....
83	Loranthaceæ.....	1	1	.....	1	.....	1	.....
84	Euphorbiaceæ.....	4	9	.....	9	1	.....	.....
85	Urticaceæ.....	11	13	.....	13	4	6	6
86	Platanaceæ.....	1	1	.....	1	.....	1	1
87	Juglandaceæ.....	2	7	.....	7	.....	7	7
88	Myricaceæ.....	1	1	.....	1	.....	1	.....
89	Cupuliferæ.....	7	26	1	27	.....	27	24
90	Salicaceæ.....	2	14	5	19	7	19	6
91	Ceratophyllaceæ.....	1	1	.....	1	.....	.....	.....
92	Araceæ.....	5	6	.....	6	.....	.....	.....
93	Lemnaceæ.....	1	1	.....	1	.....	.....	.....
94	Typhaceæ.....	2	3	1	4	.....	.....	.....

XVI. SUMMARY—Continued.

Number.	Orders.	Genera.	Species.	Varieties.	Species and Varieties.	Introduced Plants.	Woody Plants.	Trees.
95	Naidaceæ.....	2	9		9			
96	Alismaceæ.....	2	3	2	5			
97	Hydrocharidaceæ.....	2	2		2			
98	Orchidaceæ.....	12	23	1	24			
99	Amoryllidaceæ.....	1	1		1			
100	Hamodoraceæ.....	1	1		1			
101	Iridaceæ.....	2	6		6	1		
102	Dioscoreaceæ.....	1	1		1			
103	Smilaceæ.....	1	6		6		4	
104	Liliaceæ.....	19	25		25	5		
105	Juncaceæ.....	2	8	7	15			
106	Pontederiaceæ.....	3	3		3			
107	Commelynaceæ.....	2	3		3			
108	Xyridaceæ.....	1	1		1			
109	Eriocaulonaceæ.....	1	1		1			
110	Cyperaceæ.....	10	94	14	108			
111	Gramineæ.....	43	104	6	110	26		
112	Coniferæ.....	4	7		7	1	7	7
113	Equisetaceæ.....	1	2		2			
114	Filices.....	16	29	1	30			
115	Ophioglossaceæ.....	2	2	2	4			
116	Lycopodiaceæ.....	2	5	1	6			
117	Musci.....	42	98		98			
118	Hepaticæ.....	23	29		29			
119	Characeæ.....	2	4		4			

RECAPITULATION.

Groups.	Orders.	Genera.	Species.	Varieties.	Species and Varieties.	Introduced Plants.	Woody Plants.	Trees.
Polypetalæ.....	45	174	339	18	357	73	83	25
Gamopetalæ.....	27	169	368	21	389	57	36	9
Dichlamydeæ.....	72	343	707	39	746	130	119	34
Monochlamydeæ.....	19	47	116	10	126	30	65	45
Dicotyledones.....	91	390	823	49	872	160	184	79
Monocotyledones.....	20	113	301	31	332	32	4	
Gymnospermæ.....	1	4	7		7	1	7	7
Phanogamia.....	112	507	1,131	80	1,211	193	195	86
Vascular Cryptogamia.....	4	21	38	4	42			
Vascular Plants.....	116	528	1,169	84	1,253	193	195	86
Cellular Cryptogamia.....	3	67	131		131			
Total Flora.....	119	595	1,300	84	1,384	193	195	86

XVII. CHECK-LIST.

1. *Clematis ochroleuca*, Ait.
2. *Clematis Viorna*, L.
3. *Clematis Virginiana*, L.
4. *Thalictrum anemonoides*, Michx.
5. *Thalictrum dioicum*, L.
6. *Thalictrum purpurascens*, L.
7. *Thalictrum purpurascens*, L., var. *ceriferum*, C. F. Austin.
8. *Thalictrum Cornuti*, L.
9. *Anemone Virginiana*, L.
10. *Anemone nemorosa*, L.
11. *Anemone Hepatica*, L.
12. *Ranunculus ambigens*, Watson.
13. *Ranunculus pusillus*, Poir.
14. *Ranunculus abortivus*, L.
15. *Ranunculus abortivus*, L., var. *micranthus*, Nutt.
16. *Ranunculus sceleratus*, L.
17. *Ranunculus recurvatus*, Poir.
18. *Ranunculus repens*, L.
19. *Ranunculus repens*, L., var. *hispidus*, Torr. & Gray.

20. *Ranunculus repens*, L., var. *nitidus*, Chapman.

21. *Ranunculus bulbosus*, L.

22. *Ranunculus acris*, L.

23. *Aquilegia Canadensis*, L.

24. *Delphinium tricornis*, Michx.

25. *Delphinium consolida*, L.

26. *Aconitum uncinatum*, L.

27. *Cimicifuga racemosa*, Nutt.

28. *Magnolia glauca*, L.

29. *Liriodendron tulipifera*, L.

30. *Asimina triloba*, Duval.

31. *Menispermum Canadense*, L.,

32. *Berberis vulgaris*, L.

33. *Caulophyllum thalictroides*, Michx.

34. *Jeffersonia diphylla*, Pers.

35. *Podophyllum peltatum*, L.

36. *Brasenia peltata*, Pursh.

37. *Nuphar advena*, Ait.

38. *Nymphaea odorata*, Ait.

39. *Sarracenia purpurea*, L.

40. *Papaver dubium*, L.

41. *Sanguinaria Canadensis*, L.

42. *Chelidonium majus*, L.

- 43. *Dicentra Cucullaria*, DC.
- 44. *Corydalis flavula*, Raf.
- 45. *Fumaria officinalis*, L.
- 46. *Nasturtium officinale*, R. Br.
- 47. *Nasturtium sylvestre*, R. Br.
- 48. *Nasturtium obtusum*, Nutt.
- 49. *Nasturtium palustre*, DC.
- 50. *Nasturtium lacustre*, Gray.
- 51. *Nasturtium Armoracia*, Fries.
- 52. *Barbarea vulgaris*, R. Br.
- 53. *Barbarea præcox*, R. Br.
- 54. *Arabis lyrata*, L.
- 55. *Arabis dentata*, Torr. & Gray.
- 56. *Arabis patens*, Sulliv.
- 57. *Arabis hirsuta*, Scop.
- 58. *Arabis lævigata*, Poir.
- 59. *Arabis Canadensis*, L.
- 60. *Cardamine rhomboidea*, DC.
- 61. *Cardamine hirsuta*, L.
- 62. *Cardamine hirsuta*, L., var. *sylvatica*, Gray.
- 63. *Dentaria heterophylla*, Nutt.
- 64. *Dentaria laciniata*, Muhl.
- 65. *Draba ramosissima*, Desv.
- 66. *Draba verna*, L.

67. *Hesperis matronalis*, L.
68. *Sisymbrium officinale*, Scop.
69. *Sisymbrium Thaliana*, Gay.
70. *Sisymbrium Alliaria*, Scop.
71. *Erysimum cheiranthoides*, L.
72. *Camelina sativa*, Crantz.
73. *Brassica Sinapistrum*, Boiss.
74. *Brassica nigra*, Koch.
75. *Capsella Bursa-pastoris*, Moench.
76. *Lepidium Virginicum*, L.
77. *Lepidium campestre*, L.
78. *Thlaspi arvense*, L.
79. *Raphanus sativus*, L.
80. *Helianthemum Canadense*, Michx.
81. *Lechea minor*, Walt.
82. *Viola lanceolata*, L.
83. *Viola primulæfolia*, L.
84. *Viola cucullata*, Ait.
85. *Viola cucullata*, Ait., var. *palmata*, Gray.
86. *Viola cucullata*, Ait., var. *cordata*, Gray.
87. *Viola sagittata*, Ait.
88. *Viola pedata*, L.
89. *Viola pedata*, L., var. *bicolor*, Pursh.

90. *Viola striata*, Ait.
91. *Viola pubescens*, Ait.
92. *Viola pubescens*, Ait., var. *eriocarpa*, Nutt.
93. *Viola glabella*, Nutt.
94. *Viola tricolor*, L., var. *arvensis*, Ging.
95. *Ionidium concolor*, Benth. & Hook.
96. *Polygala incarnata*, L.
97. *Polygala sanguinea*, L.
98. *Polygala fastigiata*, Nutt.
99. *Polygala Curtissii*, Gray.
100. *Polygala ambigua*, Nutt.
101. *Polygala polygama*, Walt.
102. *Polygala Senega*, L.
103. *Dianthus Armeria*, L.
104. *Saponaria officinalis*, L.
105. *Silene stellata*, Ait.
106. *Silene nivea*, DC.
107. *Silene Pennsylvanica*, Michx.
108. *Silene Armeria*, L.
109. *Silene antirrhina*, L.
110. *Lychnis Githago*, Lam.
111. *Cerastium viscosum*, L.
112. *Cerastium vulgatum*, L.
113. *Cerastium nutans*, Raf.

- 114. *Cerastium oblongifolium*, Torr.
- 115. *Stellaria media*, Smith.
- 116. *Stellaria pubera*, Michx.
- 117. *Stellaria longifolia*, Muhl.
- 118. *Arenaria serpyllifolia*, L.
- 119. *Sagina apetala*, L.
- 120. *Sagina decumbens*, Torr. & Gray.
- 121. *Lepigonum rubrum*, Fries.
- 122. *Anychia dichotoma*, Michx.
- 123. *Anychia dichotoma*, Michx., var. *capillacea*, Torr.
- 124. *Paronychia dichotoma*, Nutt.
- 125. *Portulaca oleracea*, L.
- 126. *Claytonia Virginica*, L.
- 127. *Ascyrum Crux-Andreæ*, L.
- 128. *Ascyrum stans*, Michx.
- 129. *Hypericum prolificum*, L.
- 130. *Hypericum perforatum*, L.
- 131. *Hypericum corymbosum*, Muhl.
- 132. *Hypericum mutilum*, L.
- 133. *Hypericum Canadense*, L.
- 134. *Hypericum Sarothra*, Michx.
- 135. *Elodes Virginica*, Nutt.
- 136. *Malva rotundifolia*, L.
- 137. *Malva sylvestris*, L.

138. *Sida spinosa*, L.
139. *Abutilon Avicennæ*, Gaertn.
140. *Hibiscus Moscheutos*, L.
141. *Hibiscus militaris*, Cav.
142. *Hibiscus Trionum*, L.
143. *Tilia Americana*, L.
144. *Linum Virginianum*, L.
145. *Linum striatum*, Walt.
146. *Linum usitatissimum*, L.
147. *Geranium maculatum*, L.
148. *Geranium Carolinianum*, L.
149. *Geranium columbinum*, L.
150. *Geranium pusillum*, L.
151. *Erodium cicutarium*, L'Her.
152. *Oxalis violacea*, L.
153. *Oxalis corniculata*, L., var. *stricta*, Sav.
154. *Impatiens pallida*, Nutt.
155. *Impatiens fulva*, Nutt.
156. *Xanthoxylum Americanum*, Mill.
157. *Ptelea trifoliata*, L.
158. *Ilex opaca*, Ait.
159. *Ilex decidua*, Walt.
160. *Ilex verticillata*, Gray.
161. *Ilex lævigata*, Gray.

- 162. *Euonymus atropurpureus*, Jacq.
- 163. *Euonymus Americanus*, L.
- 164. *Euonymus Americanus*, L., var. *obovatus*, Torr. & Gray.
- 165. *Celastrus scandens*, L.
- 166. *Ceanothus Americanus*, L.
- 167. *Ceanothus ovatus*, Desf.
- 168. *Vitis Labrusca*, L.
- 169. *Vitis æstivalis*, Michx.
- 170. *Vitis cordifolia*, Lam.
- 171. *Vitis riparia*, Michx.
- 172. *Vitis vulpina*, L.
- 173. *Ampelopsis quinquefolia*, Michx.
- 174. *Acer saccharinum*, Wang.
- 175. *Acer dasycarpum*, Ehrh.
- 176. *Acer rubrum*, L.
- 177. *Negundo aceroides*, Moench.
- 178. *Staphylea trifolia*, L.
- 179. *Rhus typhina*, L.
- 180. *Rhus glabra*, L.
- 181. *Rhus copallina*, L.
- 182. *Rhus venenata*, DC.
- 183. *Rhus Toxicodendron*, L.
- 184. *Rhus aromatica*, Ait.
- 185. *Baptisia tinctoria*, R. Br.

186. *Baptisia australis*, R. Br.
187. *Crotalaria sagittalis*, L.
188. *Lupinus perennis*, L.
189. *Cytisus scoparius*, Link.
190. *Medicago sativa*, L.
191. *Medicago lupulina*, L.
192. *Melilotus officinalis*, Willd.
193. *Melilotus alba*, Lam.
194. *Trifolium arvense*, L.
195. *Trifolium pratense*, L.
196. *Trifolium reflexum*, L.
197. *Trifolium repens*, L.
198. *Trifolium agrarium*, L.
199. *Trifolium procumbens*, L.
200. *Tephrosia Virginiana*, Pers.
201. *Robinia Pseudacacia*, L.
202. *Astragalus Canadensis*, L.
203. *Stylosanthes elatior*, Swartz.
204. *Desmodium nudiflorum*, DC.
205. *Desmodium acuminatum*, DC.
206. *Desmodium pauciflorum*, DC.
207. *Desmodium rotundifolium*, DC.
208. *Desmodium rotundifolium*, DC., var. *glabratum*, Gray.
209. *Desmodium canescens*, DC.

- 210. *Desmodium cuspidatum*, Hook.
- 211. *Desmodium lævigatum*, DC.
- 212. *Desmodium viridiflorum*, Beck.
- 213. *Desmodium Dillenii*, Darl.
- 214. *Desmodium paniculatum*, DC.
- 215. *Desmodium rigidum*, DC.
- 216. *Desmodium ciliare*, DC.
- 217. *Desmodium Marylandicum*, Boott.
- 218. *Lespedeza repens*, Bart.
- 219. *Lespedeza reticulata*, Pers., var. *angustifolia*, Maxim.
- 220. *Lespedeza violacea*, Pers.
- 221. *Lespedeza Stuvei*, Nutt.
- 222. *Lespedeza hirta*, Ell.
- 223. *Lespedeza capitata*, Michx.
- 224. *Vicia sativa*, L.
- 225. *Vicia tetrasperma*, Loisel.
- 226. *Vicia hirsuta*, Koch.
- 227. *Vicia Caroliniana*, Walt.
- 228. *Lathyrus paluster*, L.
- 229. *Lathyrus venosus*, Muhl.
- 230. *Clitoria Mariana*, L.
- 231. *Amphicarpæa monoica*, Ell.
- 232. *Apios tuberosa*, Moench.
- 233. *Galactia mollis*. Michx.

- 234. *Phaseolus perennis*, Walt.
- 235. *Phaseolus helvolus*, L.
- 236. *Rhynchosia tomentosa*, Torr. & Gray.
- 237. *Gleditschia triacanthos*, L.
- 238. *Cassia Marylandica*, L.
- 239. *Cassia Chamæcrista*, L.
- 240. *Cassia nictitans*, L.
- 241. *Cercis Canadensis*, L.
- 242. *Prunus Persica*, Benth. & Hook.
- 243. *Prunus Armentaca*, L.
- 244. *Prunus Americana*, Marshall.
- 245. *Prunus Chicasa*, Michx.
- 246. *Prunus spinosa*, L.
- 247. *Prunus Virginiana*, L.
- 248. *Prunus serotina*, Ehrh.
- 249. *Spiræa salicifolia*, L.
- 250. *Spiræa Aruncus*, L.
- 251. *Neillia opulifolia*, Benth. & Hook.
- 252. *Gillenia trifoliata*, Moench.
- 253. *Rubus occidentalis*, L.
- 254. *Rubus villosus*, Ait.
- 255. *Rubus Canadensis*, L.
- 256. *Rubus hispidus*, L.
- 257. *Rubus cuneifolius*, Pursh.

- 258. *Geum album*, Gmel.
- 259. *Geum Virginianum*, L.
- 260. *Geum strictum*, Ait.
- 261. *Geum vernum*, Torr. & Gray.
- 262. *Fragaria Virginiana*, Duchesne.
- 263. *Fragaria Indica*, Andr.
- 264. *Potentilla Norvegica*, L.
- 265. *Potentilla Canadensis*, L.
- 266. *Potentilla Canadensis*, L., var. *simplex*, Torr. & Gray.
- 267. *Alchemilla arvensis*, Scop.
- 268. *Agrimonia Eupatoria*, L.
- 269. *Agrimonia parviflora*, Hook.
- 270. *Poterium Canadense*, Benth. & Hook.
- 271. *Poterium Sanguisorba*, L.
- 272. *Rosa setigera*, Michx.
- 273. *Rosa Carolina*, L.
- 274. *Rosa lucida*, Ehrh.
- 275. *Rosa rubiginosa*, L.
- 276. *Rosa micrantha*, Smith.
- 277. *Rosa canina*, L.
- 278. *Pirus coronaria*, L.
- 279. *Pirus arbutifolia*, L.
- 280. *Pirus arbutifolia*, L., var. *melanocarpa*, Hook.

- 281. *Cratægus cordata*, Ait.
- 282. *Cratægus Oxyacantha*, L.
- 283. *Cratægus coccinea*, L.
- 284. *Cratægus Crus-galli*, L.
- 285. *Cratægus parvifolia*, Ait.
- 286. *Amelanchier Canadensis*, Torr. & Gray.
- 287. *Amelanchier Canadensis*, var. *oblongifolia*, Torr. & Gray.
- 288. *Saxifraga Virginiensis*, Michx.
- 289. *Mitella diphylla*, L.
- 290. *Heuchera Americana*, L.
- 291. *Chrysosplenium Americanum*, Schwein.
- 292. *Hydrangea arborescens*, L.
- 293. *Philadelphus inodorus*, L.
- 294. *Itea Virginica*, L.
- 295. *Ribes rotundifolium*, Michx.
- 296. *Ribes rubrum*, L.
- 297. *Sedum ternatum*, Michx.
- 298. *Sedum telephioides*, Michx.
- 299. *Penthorum sedoides*, L.
- 300. *Drosera rotundifolia*, L.
- 301. *Hamamelis Virginiana*, L.
- 302. *Liquidambar Styraciflua*, L.
- 303. *Myriophyllum spicatum*, L.

- 304. *Proserpinaca palustris*, L.
- 305. *Callitriche verna*, L.
- 306. *Rhexia Virginica*, L.
- 307. *Ammannia humilis*, Michx.
- 308. *Cuphea viscosissima*, Jacq.
- 309. *Lythrum alatum*, Pursh.
- 310. *Nesaea verticillata*, H. B. K.
- 311. *Epilobium coloratum*, Muhl.
- 312. *Jussiaea decurrens*, DC.
- 313. *Ludwigia alternifolia*, L.
- 314. *Ludwigia hirtella*, Raf.
- 315. *Ludwigia palustris*, Ell.
- 316. *Ceanothera biennis*, L.
- 317. *Ceanothera sinuata*, L.
- 318. *Ceanothera fruticosa*, L.
- 319. *Ceanothera fruticosa*, L., var. *linearis*, Watson.
- 320. *Gaura biennis*, L.
- 321. *Circæa Lutetiana*, L.
- 322. *Passiflora incarnata*, L.
- 323. *Passiflora lutea*, L.
- 324. *Sicyos angulatus*, L.
- 325. *Opuntia vulgaris*, Haworth.
- 326. *Mollugo verticillata*, L.
- 327. *Hydrocotyle ranunculoides*, L.

- 328. *Hydrocotyle Americana*, L.
- 329. *Eryngium Virginianum*, Lam.
- 330. *Sanicula Canadensis*, L.
- 331. *Sanicula Marylandica*, L.
- 332. *Erigenia bulbosa*, Nutt.
- 333. *Cicuta maculata*, L.
- 334. *Sium cicutæfolium*, Gmel.
- 335. *Pimpinella integerrima*, Benth. & Hook.
- 336. *Cryptotænia Canadensis*, DC.
- 337. *Osmorrhiza longistylis*, DC.
- 338. *Osmorrhiza brevistylis*, DC.
- 339. *Chærophyllum procumbens*, Crantz.
- 340. *Discopleura capillacea*, DC.
- 341. *Thaspium barbinode*, Nutt.
- 342. *Thaspium aureum*, Nutt.
- 343. *Thaspium trifoliatum*, Gray.
- 344. *Archangelica hirsuta*, Torr. & Gray.
- 345. *Pastinaca sativa*, L.
- 346. *Archemora rigida*, DC.
- 347. *Heracleum lanatum*, Michx.
- 348. *Daucus Carota*, L.
- 349. *Aralia spinosa*, L.
- 350. *Aralia racemosa*, L.
- 351. *Aralia nudicaulis*, L.

- 352. *Aralia trifolia*, Decsne.
- 353. *Cornus florida*, L.
- 354. *Cornus sericea*, L.
- 355. *Cornus stolonifera*, Michx.
- 356. *Cornus alternifolia*, L.
- 357. *Nyssa multiflora*, Wang.
- 358. *Sambucus Canadensis*, L.
- 359. *Viburnum prunifolium*, L.
- 360. *Viburnum nudum*, L.
- 361. *Viburnum dentatum*, L.
- 362. *Viburnum pubescens*, Pursh.
- 363. *Viburnum acerifolium*, L.
- 364. *Triosteum perfoliatum*, L.
- 365. *Triosteum angustifolium*, L.
- 366. *Symphoricarpos racemosus*, Michx.
- 367. *Symphoricarpos vulgaris*, Michx.
- 368. *Lonicera sempervirens*, Ait.
- 369. *Lonicera Japonica*, Andr.
- 370. *Cephalanthus occidentalis*, L.
- 371. *Houstonia purpurea*, L.
- 372. *Houstonia purpurea*, L., var. *longifolia*, Gray
- 373. *Houstonia cærulea*, L.
- 374. *Mitchella repens*, L.
- 375. *Diodia teres*, Walt.

- 376. *Galium Aparine*, L.
- 377. *Galium asprellum*, Michx.
- 378. *Galium concinnum*, Torr. & Gray.
- 379. *Galium trifidum*, L.
- 380. *Galium triflorum*, Michx.
- 381. *Galium pilosum*, Ait.
- 382. *Galium circæzans*, Michx.
- 383. *Valeriana pauciflora*, Michx.
- 384. *Fedia olitoria*, Vahl.
- 385. *Fedia Fagopyrum*, Torr. & Gray.
- 386. *Fedia radiata*, Michx.
- 387. *Dipsacus sylvestris*, Mill.
- 388. *Vernonia Noveboracensis*, Willd.
- 389. *Elephantopus Carolinianus*, Willd.
- 390. *Eupatorium purpureum*, L.
- 391. *Eupatorium hyssopifolium*, L.
- 392. *Eupatorium album*, L.
- 393. *Eupatorium teucrifolium*, Willd.
- 394. *Eupatorium rotundifolium*, L.
- 395. *Eupatorium pubescens*, Muhl.
- 396. *Eupatorium sessilifolium*, L.
- 397. *Eupatorium sessilifolium* × *pubescens*, Gray.
- 398. *Eupatorium perfoliatum*, L.
- 399. *Eupatorium ageratoides*, L.

- 400. *Eupatorium aromaticum*, L.
- 401. *Conoclinium cœlestinum*, DC.
- 402. *Mikania scandens*, L.
- 403. *Kuhnia eupatorioides*, L.
- 404. *Liatris scariosa*, Willd.
- 405. *Liatris graminifolia*, Willd.
- 406. *Liatris graminifolia*, Willd., var. *dubia*, Gray.
- 407. *Chrysopsis Mariana*, Nutt.
- 408. *Solidago bicolor*, L.
- 409. *Solidago bicolor*, L., var. *concolor*, Gray.
- 410. *Solidago latifolia*, L.
- 411. *Solidago cæsia*, L.
- 412. *Solidago stricta*, Ait.
- 413. *Solidago speciosa*, Nutt., var. *angustata*, Gray.
- 414. *Solidago Virga-aurea*, L., var. *humilis*, Gray.
- 415. *Solidago rigida*, L.
- 416. *Solidago elliptica*, Ait.
- 417. *Solidago arguta*, Ait.
- 418. *Solidago altissima*, L.
- 419. *Solidago ulmifolia*, Muhl.
- 420. *Solidago odora*, Ait.
- 421. *Solidago nemoralis*, Ait.
- 422. *Solidago rupestris*, Raf.
- 423. *Solidago Canadensis*, L.

- 424. *Solidago gigantea*, Ait.
- 425. *Solidago lanceolata*, L.
- 426. *Sericocarpus solidagineus*, Nees.
- 427. *Sericocarpus conyzoides*, Nees.
- 428. *Aster corymbosus*, Ait.
- 429. *Aster macrophyllus*, L.
- 430. *Aster concolor*, L.
- 431. *Aster patens*, Ait.
- 432. *Aster lævis*, L.
- 433. *Aster lævis*, L., var. *cyaneus*, Gray.
- 434. *Aster undulatus*, L.
- 435. *Aster cordifolius*, L.
- 436. *Aster ericoides*, L.
- 437. *Aster dumosus*, L.
- 438. *Aster Tradescanti*, L.
- 439. *Aster miser*, L.
- 440. *Aster simplex*, Willd.
- 441. *Aster tenuifolius*, L.
- 442. *Aster carneus*, Nees.
- 443. *Aster æstivus*, Ait.
- 444. *Aster puniceus*, L.
- 445. *Aster puniceus*, L., var. *vimineus*, Gray.
- 446. *Aster prenanthoides*, Muhl.
- 447. *Aster oblongifolius*, Nutt.

- 448. *Aster Novæ-Angliæ*, L.
- 449. *Diplopappus linariifolius*, Hook.
- 450. *Diplopappus umbellatus*, Torr. & Gray.
- 451. *Diplopappus cornifolius*, Darl.
- 452. *Erigeron Canadensis*, L.
- 453. *Erigeron bellidifolius*, Muhl.
- 454. *Erigeron Philadelphicus*, L.
- 455. *Erigeron annuus*, Pers.
- 456. *Erigeron strigosus*, Muhl.
- 457. *Baccharis halimifolia*, L.
- 458. *Filago Germanica*, L.
- 459. *Antennaria plantaginifolia*, Hook.
- 460. *Gnaphalium polycephalum*, Michx.
- 461. *Gnaphalium uliginosum*, L.
- 462. *Gnaphalium purpureum*, L.
- 463. *Polymnia Canadensis*, L.
- 464. *Polymnia Uvedalia*, L.
- 465. *Silphium trifoliatum*, L.
- 466. *Chrysogonum Virginianum*, L.
- 467. *Ambrosia trifida*, L.
- 468. *Ambrosia trifida*, L., var. *integrifolia*, Gray.
- 469. *Ambrosia artemisiæfolia*, L.
- 470. *Xanthium strumarium*, L.

- 471. *Xanthium spinosum*, L.
- 472. *Heliopsis lævis*, Pers.
- 473. *Eclipta procumbens*, Michx.
- 474. *Rudbeckia laciniata*, L.
- 475. *Rudbeckia triloba*, L.
- 476. *Rudbeckia hirta*, L.
- 477. *Rudbeckia fulgida*, Ait.
- 478. *Helianthus annuus*, L.
- 479. *Helianthus angustifolius*, L.
- 480. *Helianthus occidentalis*, Riddell.
- 481. *Helianthus giganteus*, L.
- 482. *Helianthus strumosus*, L.
- 483. *Helianthus strumosus*, L., var. *mollis*, Gray
- 484. *Helianthus divaricatus*, L.
- 485. *Helianthus decapetalus*, L.
- 486. *Helianthus doronicoides*, Lam.
- 487. *Helianthus tuberosus*, L.
- 488. *Actinomeris squarrosa*, Nutt.
- 489. *Verbesina Siegesbeckia*, Michx.
- 490. *Coreopsis tinctoria*, Radius.
- 491. *Coreopsis verticillata*, L.
- 492. *Coreopsis tripteris*, L.
- 493. *Coreopsis discoidea*, Torr. & Gray.
- 494. *Bidens frondosa*, L.

- 495. *Bidens cernua*, L.
- 496. *Bidens chrysanthemoides*, Michx.
- 497. *Bidens bipinnata*, L.
- 498. *Helenium autumnale*, L.
- 499. *Achillea Millefolium*, L.
- 500. *Anthemis arvensis*, L.
- 501. *Maruta Cotula*, DC.
- 502. *Leucanthemum vulgare*, L.
- 503. *Arnica nudicaulis*, Ell.
- 504. *Erechthites hieracifolia*, Raf.
- 505. *Senecio aureus*, L.
- 506. *Senecio aureus*, L., var. *Balsamitæ*, Gray.
- 507. *Cacalia suaveolens*, L.
- 508. *Cacalia reniformis*, Muhl.
- 509. *Cacalia atriplicifolia*, L.
- 510. *Lappa officinalis*, Allioni.
- 511. *Cnicus lanceolatus*, Gray.
- 512. *Cnicus discolor*, Gray.
- 513. *Cnicus altissimus*, Gray.
- 514. *Cnicus arvensis*, Gray.
- 515. *Onopordon acanthium*, L.
- 516. *Centaurea Cyanus*, L.
- 517. *Centaurea Calcitrapa*, L.
- 518. *Cichorium Intybus*, L.

- 519. *Krigia Virginica*, Willd.
- 520. *Cynthia Dandelion*, DC.
- 521. *Hieracium scabrum*, Michx.
- 522. *Hieracium Gronovii*, L.
- 523. *Hieracium venosum*, L.
- 524. *Hieracium venosum*, L., var. *subcaulescens*, Gray.
- 525. *Hieracium paniculatum*, L.
- 526. *Taraxacum Dens-leonis*, Desf.
- 527. *Chondrilla juncea*, L.
- 528. *Lactuca Canadensis*, L.
- 529. *Lactuca Canadensis*, L., var. *integrifolia*, Torr. & Gray.
- 530. *Mulgedium acuminatum*, DC.
- 531. *Mulgedium Floridanum*, DC.
- 532. *Mulgedium leucophæum*, DC.
- 533. *Nabalus albus*, Hook.
- 534. *Nabalus Fraseri*, DC.
- 535. *Sonchus oleraccus*, L.
- 536. *Sonchus asper*, Vill.
- 537. *Lobelia cardinalis*, L.
- 538. *Lobelia syphilitica*, L.
- 539. *Lobelia puberula*, Michx.
- 540. *Lobelia spicata*, Lam.
- 541. *Lobelia inflata*, L.
- 542. *Specularia perfoliata*, A. DC.

- 543. *Campanula Americana*, L.
- 544. *Gaylussacia dumosa*, Torr. & Gray.
- 545. *Gaylussacia frondosa*, Torr. & Gray.
- 546. *Gaylussacia resinosa*, Torr. & Gray.
- 547. *Vaccinium vacillans*, Solander.
- 548. *Vaccinium stamineum*, L.
- 549. *Vaccinium corymbosum*, L.
- 550. *Epigæa repens*, L.
- 551. *Gaultheria procumbens*, L.
- 552. *Andromeda Mariana*, L.
- 553. *Andromeda ligustrina*, Muhl.
- 554. *Leucothoë racemosa*, Gray.
- 555. *Kalmia latifolia*, L.
- 556. *Kalmia angustifolia*, L.
- 557. *Rhododendron viscosum*, Torr.
- 558. *Rhododendron viscosum*, Torr., var. *glaucum*, Gray
- 559. *Rhododendron viscosum*, Torr., var. *nitidum*, Gray.
- 560. *Rhododendron nudiflorum*, Torr.
- 561. *Rhododendron maximum*, L.
- 562. *Chimaphila umbellata*, Nutt.
- 563. *Chimaphila maculata*, Pursh.
- 564. *Pyrola secunda*, L.
- 565. *Pyrola chlorantha*, Swartz.
- 566. *Pyrola elliptica*, Nutt

- 567. *Pyrola rotundifolia*, L.
- 568. *Monotropa uniflora*, L.
- 569. *Monotropa Hypopitys*, L.
- 570. *Dodecatheon Meadia*, L.
- 571. *Steironema ciliatum*, Raf.
- 572. *Steironema lanceolatum*, Gray.
- 573. *Steironema lanceolatum*, var. *hybridum*, Gray.
- 574. *Steironema longifolium*, Gray.
- 575. *Lysimachia quadrifolia*, L.
- 576. *Lysimachia stricta*, Ait.
- 577. *Lysimachia nummularia*, L.
- 578. *Anagallis arvensis*, L.
- 579. *Samolus Valerandi*, L., var. *Americanus*, Gray.
- 580. *Diospyros Virginiana*, L.
- 581. *Fraxinus Americana*, L.
- 582. *Fraxinus pubescens*, Lam.
- 583. *Fraxinus viridis*, Michx. f.
- 584. *Chionanthus Virginica*, L.
- 585. *Vinca minor*, L.
- 586. *Apocynum cannabinum*, L.
- 587. *Apocynum cannabinum*, L., var. *glaberrimum*, DC
- 588. *Asclepias tuberosa*, L.
- 589. *Asclepias rubra*, L.

- 590. *Asclepias purpurascens*, L.
- 591. *Asclepias incarnata*, L.
- 592. *Asclepias incarnata*, L., var. *pulchra*, Pers.
- 593. *Asclepias Cornuti*, Decsne.
- 594. *Asclepias obtusifolia*, Michx.
- 595. *Asclepias variegata*, L.
- 596. *Asclepias quadrifolia*, Jacq.
- 597. *Asclepias verticillata*, L.
- 598. *Acerates viridiflora*, Ell.
- 599. *Enslenia albida*, Nutt.
- 600. *Gonolobus obliquus*, R. Br.
- 601. *Gonolobus hirsutus*, Michx.
- 602. *Sabbatia angularis*, Pursh.
- 603. *Gentiana Saponaria*, L.
- 604. *Gentiana Andrewsii*, Griseb.
- 605. *Gentiana ochroleuca*, Froel.
- 606. *Bartonia tenella*, Muhl.
- 607. *Obolaria Virginica*, L.
- 608. *Phlox paniculata*, L.
- 609. *Phlox maculata*, L.
- 610. *Phlox pilosa*, L.
- 611. *Phlox divaricata*, L.
- 612. *Phlox subulata*, L.
- 613. *Polemonium reptans*, L.

614. *Hydrophyllum Virginicum*, L.
615. *Ellisia Nyctelea*, L.
616. *Phacelia Purshii*, Buckley
617. *Phacelia parviflora*, Pursh.
618. *Cynoglossum officinale*, L.
619. *Cynoglossum Virginicum*, L.
620. *Echinosperrum Virginicum*, Lehm.
621. *Mertensia Virginica*, DC.
622. *Myosotis palustris*, With.
623. *Myosotis laxa*, Lehm.
624. *Myosotis arvensis*, Hoffm.
625. *Myosotis verna*, Nutt.
626. *Lithospermum arvense*, L.
627. *Lithospermum canescens*, Lehm.
628. *Onosmodium Virginianum*, DC.
629. *Echium vulgare*, L.
630. *Ipomœa coccinea*, L.
631. *Ipomœa Nil*, Roth.
632. *Ipomœa purpurea*, Lam.
633. *Ipomœa pandurata*, Meyer.
634. *Ipomœa lacunosa*, L.
635. *Convolvulus spithamæus*, L.
636. *Convolvulus sepium*, L.
637. *Convolvulus arvensis*, L.

- 638. *Cuscuta chlorocarpa*, Eng.
- 639. *Cuscuta arvensis*, Beyrich.
- 640. *Cuscuta Gronovii*, Willd.
- 641. *Solanum nigrum*, L.
- 642. *Solanum Carolinense*, L.
- 643. *Physalis pubescens*, L.
- 644. *Physalis viscosa*, L.
- 645. *Nicandra physaloides*, Gaertn.
- 646. *Lycium vulgare*, Duval.
- 647. *Datura Stramonium*, L.
- 648. *Datura Tatula*, L.
- 649. *Verbascum Thapsus*, L.
- 650. *Verbascum Blattaria*, L.
- 651. *Linaria Canadensis*, Dumont.
- 652. *Linaria vulgaris*, Mill.
- 653. *Linaria Elatine*, Mill.
- 654. *Scrophularia nodosa*, L.
- 655. *Chelone glabra*, L.
- 656. *Pentstemon pubescens*, Solander.
- 657. *Pentstemon lævigatus*, Solander.
- 658. *Mimulus ringens*, L.
- 659. *Mimulus alatus*, Solander.
- 660. *Herpestis nigrescens*, Benth.
- 661. *Gratiola Virginiana*, L.

- 662. *Gratiola pilosa*, Michx.
- 663. *Ilysanthes gratioloïdes*, Benth.
- 664. *Micranthemum Nuttallii*, Gray.
- 665. *Veronica Virginica*, L.
- 666. *Veronica Americana*, Schwein.
- 667. *Veronica scutellata*, L.
- 668. *Veronica officinalis*, L.
- 669. *Veronica serpyllifolia*, L.
- 670. *Veronica peregrina*, L.
- 671. *Veronica arvensis*, L.
- 672. *Buchnera Americana*, L.
- 673. *Gerardia pedicularia*, L.
- 674. *Gerardia flava*, L.
- 675. *Gerardia quercifolia*, Pursh.
- 676. *Gerardia purpurea*, L.
- 677. *Gerardia tenuifolia*, Vahl.
- 678. *Pedicularis Canadensis*, L.
- 679. *Pedicularis lanceolata*, Michx.
- 680. *Melampyrum Americanum*, Michx
- 681. *Orobanche minor*, L.
- 682. *Aphyllon uniflorum*, Gray.
- 683. *Conopholis Americana*, Wallroth.
- 684. *Epiphegus Virginiana*, Bart.
- 685. *Utricularia vulgaris*, L.

686. *Utricularia gibba*, L.
687. *Tecoma radicans*, Juss.
688. *Catalpa bignonioides*, Walt.
689. *Ruellia ciliosa*, Pursh.
690. *Ruellia ciliosa*, Pursh, var. *ambigua*, Gray.
691. *Ruellia strepens*, L.
692. *Dianthera Americana*, L.
693. *Phryma Leptostachya*, L.
694. *Verbena officinalis*, L.
695. *Verbena urticæfolia*, L.
696. *Verbena angustifolia*, Michx.
697. *Verbena hastata*, L.
698. *Lippia lanceolata*, Michx.
699. *Trichostema dichotomum*, L.
700. *Isanthus cæruleus*, Michx.
701. *Teucrium Canadense*, L.
702. *Collinsonia Canadensis*, L.
703. *Perilla ocimoides*, L., var. *crispa* (Gray!).
704. *Mentha viridis*, L.
705. *Mentha piperita*, L.
706. *Mentha Canadensis*, L.
707. *Lycopus Virginicus*, L.
708. *Lycopus rubellus*, Moench.
709. *Lycopus sinuatus*, Ell.

710. *Cunila Mariana*, L.
711. *Pycnanthemum linifolium*, Pursh.
712. *Pycnanthemum lanceolatum*, Pursh.
713. *Pycnanthemum muticum*, Pers.
714. *Pycnanthemum Torreyi*, Benth.
715. *Pycnanthemum clinopodioides*, Gray.
716. *Pycnanthemum incanum*, Michx.
717. *Calamintha Nepeta*, Link.
718. *Calamintha Clinopodium*, Benth.
719. *Melissa officinalis*, L.
720. *Hedeoma pulegioides*, Pers.
721. *Salvia lyrata*, L.
722. *Salvia urticifolia*, L.
723. *Monarda fistulosa*, L.
724. *Monarda punctata*, L.
725. *Lophanthus nepetoides*, Benth.
726. *Nepeta Cataria*, L.
727. *Nepeta Glechoma*, Benth.
728. *Scutellaria lateriflora*, L.
729. *Scutellaria saxatilis*, Riddell.
730. *Scutellaria serrata*, Andrews.
731. *Scutellaria pilosa*, Michx.
732. *Scutellaria integrifolia*, L.

- 733. *Scutellaria nervosa*, Pursh.
- 734. *Brunella vulgaris*, L.
- 735. *Physostegia Virginiana*, Benth.
- 736. *Marrubium vulgare*, L.
- 737. *Leonurus Cardiaca*, L.
- 738. *Lamium amplexicaule*, L.
- 739. *Stachys palustris*, L.
- 740. *Stachys aspera*, Michx.
- 741. *Plantago cordata*, Lam.
- 742. *Plantago major*, L.
- 743. *Plantago Rugelii*, Decsne.
- 744. *Plantago lanceolata*, L.
- 745. *Plantago Patagonica*, Jacq., var. *aristata*, Gray.
- 746. *Plantago Virginica*, L.
- 747. *Amarantus paniculatus*, L.
- 748. *Amarantus retroflexus*, L.
- 749. *Amarantus albus*, L.
- 750. *Amarantus spinosus*, L.
- 751. *Acnida cannabina*, L.
- 752. *Chenopodium album*, L.
- 753. *Chenopodium Boscianum*, Moq.
- 754. *Chenopodium urbicum*, L.
- 755. *Chenopodium murale*, L.

756. *Chenopodium Botrys*, L.
757. *Chenopodium ambrosioides*, L.
758. *Chenopodium ambrosioides*, L., var. *anthelminticum*, Gray.
759. *Atriplex patula*, L., var. *hastata*, Gray.
760. *Salsola Kali*, L.
761. *Phytolacca decandra*, L.
762. *Polygonum orientale*, L.
763. *Polygonum Pennsylvanicum*, L.
764. *Polygonum incarnatum*, Ell.
765. *Polygonum Persicaria*, L.
766. *Polygonum Hydropiper*, L.
767. *Polygonum acre*, H. B. K.
768. *Polygonum hydropiperoides*, Michx.
769. *Polygonum amphibium*, L.
770. *Polygonum amphibium*, L., var. *terrestre*, Willd.
771. *Polygonum Virginianum*, L.
772. *Polygonum aviculare*, L.
773. *Polygonum erectum*, L.
774. *Polygonum arifolium*, L.
775. *Polygonum sagittatum*, L.
776. *Polygonum Convolvulus*, L.
777. *Polygonum dumetorum*, L.
778. *Polygonum dumetorum*, L., var. *scandens*, Gray

- 779. *Fagopyrum esculentum*, Moench.
- 780. *Rumex Britannica*, L.
- 781. *Rumex verticillatus*, L.
- 782. *Rumex crispus*, L.
- 783. *Rumex obtusifolius*, L.
- 784. *Rumex crispus* × *obtusifolius*, Gray,
- 785. *Rumex Acetosella*, L.
- 786. *Podostemon ceratophyllus*, Michx.
- 787. *Asarum Canadense*, L.
- 788. *Aristolochia Serpentaria*, L.
- 789. *Saururus cernuus*, L.
- 790. *Sassafras officinale*, Nees.
- 791. *Lindera Benzoin*, Meisner.
- 792. *Dirca palustris*, L.
- 793. *Comandra umbellata*, Nutt.
- 794. *Phoradendron flavescens*, Nutt.
- 795. *Euphorbia maculata*, L.
- 796. *Euphorbia hypericifolia*, L.
- 797. *Euphorbia corollata*, L.
- 798. *Euphorbia Ipecacuanhæ*, L.
- 799. *Euphorbia dictyosperma*, Fischer & Meyer.
- 800. *Euphorbia commutata*, Eng.
- 801. *Phyllanthus Carolinensis*, Walt.

- 802. *Acalypha Virginica*, L.
- 803. *Ricinus communis*, Desf.
- 804. *Ulmus fulva*, Michx.
- 805. *Ulmus Americana*, L.
- 806. *Celtis occidentalis*, L.
- 807. *Humulus Lupulus*, L.
- 808. *Cannabis sativa*, L.
- 809. *Maclura aurantiaca*, Nutt.
- 810. *Morus rubra*, L.
- 811. *Morus alba*, L.
- 812. *Urtica dioica*, L.
- 813. *Laportea Canadensis*, Gaudichaud.
- 814. *Pilea pumila*, Gray.
- 815. *Bœhmeria cylindrica*, Willd.
- 816. *Parietaria Pennsylvanica*, Muhl.
- 817. *Platanus occidentalis*, L.
- 818. *Carya alba*, Nutt.
- 819. *Carya microcarpa*, Nutt.
- 820. *Carya tomentosa*, Nutt.
- 821. *Carya porcina*, Nutt.
- 822. *Carya amara*, Nutt.
- 823. *Juglans nigra*, L.
- 824. *Juglans cinerea*, L.

- 825. *Myrica cerifera*, L.
- 826. *Betula nigra*, L.
- 827. *Alnus serrulata*, Ait.
- 828. *Carpinus Caroliniana*, Walt.
- 829. *Ostrya Virginica*, Willd.
- 830. *Corylus Americana*, Walt.
- 831. *Quercus alba*, L.
- 832. *Quercus stellata*, Wang.
- 833. *Quercus macrocarpa*, Michx.
- 834. *Quercus bicolor*, Willd.
- 835. *Quercus Michauxii*, Nutt.
- 836. *Quercus Prinus*, L.
- 837. *Quercus Muhlenbergii*, Eng.
- 838. *Quercus prinoides*, Willd.
- 839. *Quercus rubra*, L.
- 840. *Quercus coccinea*, Wang.
- 841. *Quercus tinctoria*, Bartram.
- 842. *Quercus falcata*, Michx.
- 843. *Quercus ilicifolia*, Wang.
- 844. *Quercus palustris*, Du Roi.
- 845. *Quercus nigra*, L.
- 846. *Quercus imbricaria*, Michx.
- 847. *Quercus Phellos*, L.

348. *Quercus Leana*, Nutt.
349. *Quercus heterophylla*, Michx.
350. *Castanea pumila*, Mill.
351. *Castanea vulgaris*, Lam., var. *Americana*, A. DC.
352. *Fagus ferruginea*, Ait.
353. *Salix nigra*, Marshall.
354. *Salix nigra*, Marshall, var. *falcata*, Carey.
355. *Salix nigra*, Marshall, var. *Wardi*, Bebb.
356. *Salix fragilis* \times *alba*, Wimmer.
357. *Salix alba*, L.
358. *Salix alba*, L., var. *vitellina*, Koch.
359. *Salix Babylonica*, L.
360. *Salix longifolia*, Muhl.
361. *Salix humilis*, Marshall.
362. *Salix tristis*, Ait.
363. *Salix sericea*, Marshall.
364. *Salix cordata*, Muhl.
365. *Salix cordata* \times *sericea*, Bebb.
366. *Salix purpurea*, L.
367. *Populus grandidentata*, Michx.
368. *Populus monilifera*, Ait.
369. *Populus balsamifera*, L., var. *candicans*, Gray.
370. *Populus dilatata*, Ait.

871. *Populus alba*, L.
872. *Ceratophyllum demersum*, L.
873. *Arisæma triphyllum*, Torr.
874. *Arisæma Dracontium*, Schott.
875. *Peltandra Virginica*, Raf.
876. *Symplocarpus foetidus*, Salisb.
877. *Orontium aquaticum*, L.
878. *Acorus Calamus*, L.
879. *Lemna polyrrhiza*, L.
880. *Typha latifolia*, L.
881. *Typha angustifolia*, L.
882. *Sparganium eurycarpum*, Eng.
883. *Sparganium simplex*, Hudson, var. *androcladum*, Gray.
884. *Naias flexilis*, Rostk.
885. *Potamogeton natans*, L.
886. *Potamogeton Claytonii*, Tuckerm.
887. *Potamogeton hybridus*, Michx.
888. *Potamogeton lonchites*, Tuckerm.
889. *Potamogeton lucens*, L.
890. *Potamogeton perfoliatus*, L.
891. *Potamogeton pauciflorus*, Pursh.
892. *Potamogeton pectinatus*, L.
893. *Alisma Plantago*, L., var. *Americanum*, Gray.

894. *Sagittaria variabilis*, Eng.
895. *Sagittaria variabilis*, Eng., var. *angustifolia*, Gray.
896. *Sagittaria heterophylla*, Pursh.
897. *Sagittaria pusilla*, Nutt.
898. *Anacharis Canadensis*, Planchon.
899. *Vallisneria spiralis*, L.
900. *Orchis spectabilis*, L.
901. *Habenaria tridentata*, Hook.
902. *Habenaria virescens*, Spreng.
903. *Habenaria ciliaris*, R. Br.
904. *Habenaria lacera*, R. Br.
905. *Goodyera pubescens*, R. Br.
906. *Spiranthes latifolia*, Torr.
907. *Spiranthes cernua*, Richard.
908. *Spiranthes graminea*, Lindl., var. *Walteri*, Gray.
909. *Spiranthes gracilis*, Bigelow.
910. *Spiranthes simplex*, Gray.
911. *Pogonia ophioglossoides*, Nutt.
912. *Pogonia verticillata*, Nutt.
913. *Calopogon pulchellus*, R. Br.
914. *Tipularia discolor*, Nutt.
915. *Microstylis ophioglossoides*, Nutt.
916. *Liparis liliifolia*, Richard

- 917. *Liparis Lœselii*, Richard.
- 918. *Corallorhiza odontorhiza*, Nutt.
- 919. *Corallorhiza multiflora*, Nutt.
- 920. *Aplectrum hyemale*, Nutt.
- 921. *Cypripedium parviflorum*, Salisb.
- 922. *Cypripedium pubescens*, Willd.
- 923. *Cypripedium acaule*, Ait.
- 924. *Hypoxys erecta*, L.
- 925. *Aletris farinosa*, L.
- 926. *Iris versicolor*, L.
- 927. *Iris verna*, L.
- 928. *Iris cristata*, Ait.
- 929. *Pardanthus Chinensis*, Ker.
- 930. *Sisyrinchium anceps*, L.
- 931. *Sisyrinchium mucronatum*, Michx.
- 932. *Dioscorea villosa*, L.
- 933. *Smilax rotundifolia*, L.
- 934. *Smilax glauca*, Walt.
- 935. *Smilax hispida*, Muhl
- 936. *Smilax Pseudo-China*, L.
- 937. *Smilax herbacea*, L.
- 938. *Smilax tamnifolia*, Michx.
- 939. *Allium tricoccum*, Ait.

940. *Allium cernuum*, Roth.
941. *Allium Canadense*, Kalm.
942. *Allium vineale*, L.
943. *Polygonatum biflorum*, Ell.
944. *Polygonatum giganteum*, Dietrich.
945. *Smilacina racemosa*, Desf.
946. *Smilacina stellata*, Desf.
947. *Maianthemum Canadense*, Desf.
948. *Asparagus officinalis*, L.
949. *Lilium superbum*, L.
950. *Erythronium Americanum*, Smith.
951. *Erythronium albidum*, Nutt.
952. *Uvularia perfoliata*, L.
953. *Oakesia sessilifolia*, Watson.
954. *Medeola Virginica*, L.
955. *Trillium sessile*, L.
956. *Melanthium Virginicum*, L.
957. *Veratrum viride*, Ait.
958. *Stenanthium robustum*, Watson.
959. *Chamælorhiza Caroliniana*, Willd.
960. *Tofieldia pubens*, Pers.
961. *Ornithogalum umbellatum*, L.
962. *Muscari botryoides*, Mill.

963. *Hemerocallis fulva*, L.
964. *Luzula campestris*, DC.
965. *Juncus effusus*, L.
966. *Juncus tenuis*, Willd.
967. *Juncus tenuis*, Willd., var. *secundus*, Eng.
968. *Juncus dichotomus*, Ell.
969. *Juncus Gerardi*, Lois.
970. *Juncus bufonius*, L.
971. *Juncus marginatus*, Rostk.
972. *Juncus marginatus*, Rostk., var. *vulgaris*, Eng.
973. *Juncus marginatus*, Rostk., var. *biflorus*, Eng.
974. *Juncus acuminatus*, Michx., var. *legitimus*, Eng.
975. *Juncus scirpoides*, Lam., var. *macrostemon*, Eng.
976. *Juncus nodosus*, L., var. *megacephalus*, Eng.
977. *Juncus Canadensis*, Gay, var. *subcaudatus*, Eng.
978. *Juncus Canadensis*, Gay, var. *longicaudatus*, Eng.
979. *Pontederia cordata*, L.
980. *Heteranthera reniformis*, Ruiz & Pav.
981. *Schollera graminea*, Willd.
982. *Commelyna erecta*, L.
983. *Commelyna Virginica*, L.
984. *Tradescantia Virginica*, L.
985. *Xyris flexuosa*, Muhl.

- 986. *Eriocaulon decangulare*, L.
- 987. *Cyperus diandrus*, Torr.
- 988. *Cyperus diandrus*, var. *castaneus*, Torr.
- 989. *Cyperus Nuttallii*, Torr.
- 990. *Cyperus erythrorhizos*, Muhl.
- 991. *Cyperus virens*, Michx.
- 992. *Cyperus phymatodes*, Muhl.
- 993. *Cyperus strigosus*, L.
- 994. *Cyperus Michauxianus*, Schultes.
- 995. *Cyperus filiculmis*, Vahl.
- 996. *Cyperus Lancastriensis*, Porter.
- 997. *Cyperus ovularis*, Torr.
- 998. *Cyperus retrofractus*, Torr.
- 999. *Dulichium spathaceum*, Pers.
- 1000. *Fuirena squarrosa*, Michx.
- 1001. *Eleocharis quadrangulata*, R. Br.
- 1002. *Eleocharis obtusa*, Schultes.
- 1003. *Eleocharis palustris*, R. Br.
- 1004. *Eleocharis compressa*, Sulliv.
- 1005. *Eleocharis tenuis*, Schultes.
- 1006. *Eleocharis acicularis*, R. Br.
- 1007. *Scirpus planifolius*, Muhl.
- 1008. *Scirpus pungens*, Vahl.

- 1009. *Scirpus validus*, Vahl.
- 1010. *Scirpus debilis*, Pursh.
- 1011. *Scirpus fluviatilis*, Gray.
- 1012. *Scirpus sylvaticus*, L.
- 1013. *Scirpus atrovirens*, Muhl.
- 1014. *Scirpus polyphyllus*, Vahl.
- 1015. *Scirpus lineatus*, Michx.
- 1016. *Scirpus Eriophorum*, Michx.
- 1017. *Eriophorum Virginicum*, L.
- 1018. *Fimbristylis autumnalis*, Roem. & Schultes.
- 1019. *Fimbristylis capillaris*, Gray.
- 1020. *Rhynchospora alba*, Vahl.
- 1021. *Rhynchospora glomerata*, Vahl.
- 1022. *Scleria triglomerata*, Vahl.
- 1023. *Scleria oligantha*, Ell.
- 1024. *Scleria pauciflora*, Muhl.
- 1025. *Carex polytrichoides*, Muhl.
- 1026. *Carex Willdenovii*, Schk.
- 1027. *Carex Steudelii*, Kunth.
- 1028. *Carex bromoides*, Schk.
- 1029. *Carex decomposita*, Muhl.
- 1030. *Carex vulpinoidea*, Michx.
- 1031. *Carex stipata*, Muhl.

1032. *Carex sparganioides*, Muhl.
1033. *Carex cephalophora*, Muhl.
1034. *Carex cephalophora*, Muhl., var. *angustifolia*, Boott.
1035. *Carex Muhlenbergii*, Schk.
1036. *Carex rosea*, Schk.
1037. *Carex rosea*, Schk., var. *minor*, Boott.
1038. *Carex stellulata*, L.
1039. *Carex scoparia*, Schk.
1040. *Carex lagopodioides*, Schk.
1041. *Carex cristata*, Schw.
1042. *Carex foenea*, Willd.
1043. *Carex straminea*, Schk.
1044. *Carex straminea*, Schk., var. *tenera*, Boott.
1045. *Carex straminea*, Schk., var. *aperta*, Boott.
1046. *Carex vulgaris*, Fries.
1047. *Carex torta*, Boott.
1048. *Carex angustata*, Boott.
1049. *Carex crinita*, Lam.
1050. *Carex gynandra*, Schw.
1051. *Carex Shortiana*, Dew.
1052. *Carex tetanica*, Schk.
1053. *Carex tetanica*, Schk., var. *Woodii*, Olney
1054. *Carex granularis*, Muhl.

1055. *Carex glaucoidea*, Porter.
1056. *Carex pallescens*, L.
1057. *Carex pallescens*, L., var. *undulata*, Gray.
1058. *Carex grisea*, Wahl.
1059. *Carex gracillima*, Schw.
1060. *Carex virescens*, Muhl.
1061. *Carex virescens*, Muhl., var. *elliptica*, Olney.
1062. *Carex triceps*, Michx.
1063. *Carex platyphylla*, Carey.
1064. *Carex Careyana*, Torr.
1065. *Carex retrocurva*, Dew.
1066. *Carex digitalis*, Willd.
1067. *Carex laxiflora*, Lam.
1068. *Carex laxiflora*, Lam., var. *styloflexa*, Boott.
1069. *Carex laxiflora*, Lam., var. *plantaginea*, Boott.
1070. *Carex laxiflora*, Lam., var. *intermedia*, Boott.
1071. *Carex laxiflora*, Lam., var. *blanda*, Sulliv.
1072. *Carex laxiflora*, Lam., var. *gracillima*, Boott.
1073. *Carex Hitchcockiana*, Dew.
1074. *Carex oligocarpa*, Schk.
1075. *Carex umbellata*, Schk.
1076. *Carex Emmonsii*, Dew.
1077. *Carex nigro-marginata*, Schw.

1078. *Carex Pennsylvanica*, Lam.
1079. *Carex varia*, Muhl.
1080. *Carex pubescens*, Muhl.
1081. *Carex miliacea*, Muhl.
1082. *Carex debilis*, Michx.
1083. *Carex vestita*, Willd.
1084. *Carex riparia*, Curtis.
1085. *Carex comosa*, Boott.
1086. *Carex Pseudo-Cyperus*, L.
1087. *Carex hystericina*, Willd.
1088. *Carex tentaculata*, Muhl.
1089. *Carex intumescens*, Rudge.
1090. *Carex lupulina*, Muhl.
1091. *Carex folliculata*, L.
1092. *Carex squarrosa*, L.
1093. *Carex stenolepis*, Torr.
1094. *Carex bullata*, Schk.
1095. *Leersia Virginica*, Willd.
1096. *Leersia oryzoides*, Swartz.
1097. *Zizania aquatica*, L.
1098. *Alopecurus geniculatus*, L.
1099. *Alopecurus geniculatus*, L., var. *aristulatus*, Steud.
1100. *Phleum pratense*, L.

- 1101. *Vilfa aspera*, Beauv.
- 1102. *Agrostis perennans*, Tuckerm.
- 1103. *Agrostis scabra*, Willd.
- 1104. *Agrostis vulgaris*, With.
- 1105. *Agrostis alba*, L.
- 1106. *Cinna arundinacea*, L.
- 1107. *Muhlenbergia sobolifera*, Trin.
- 1108. *Muhlenbergia Mexicana*, Trin.
- 1109. *Muhlenbergia sylvatica*, Torr. & Gray.
- 1110. *Muhlenbergia Willdenovii*, Trin.
- 1111. *Muhlenbergia diffusa*, Schreb.
- 1112. *Muhlenbergia capillaris*, Kunth.
- 1113. *Brachyelytrum aristatum*, Beauv.
- 1114. *Calamagrostis Nuttalliana*, Steud.
- 1115. *Stipa avenacea*, L.
- 1116. *Aristida dichotoma*, Michx.
- 1117. *Aristida gracilis*, Ell.
- 1118. *Aristida oligantha*, Michx.
- 1119. *Aristida purpurascens*, Poir.
- 1120. *Spartina cynosuroides*, Willd.
- 1121. *Gymnopogon racemosus*, Beauv.
- 1122. *Cynodon Dactylon*, Pers.
- 1123. *Eleusine Indica*, Gaertn.

1124. *Tricuspis seslerioides*, Torr.
1125. *Dactylis glomerata*, L.
1126. *Eatonia Pennsylvanica*, Gray.
1127. *Melica mutica*, Walt.
1128. *Glyceria nervata*, Trin.
1129. *Glyceria aquatica*, Smith.
1130. *Glyceria fluitans*, R. Br.
1131. *Poa annua*, L.
1132. *Poa compressa*, L.
1133. *Poa compressa*, L., var. *gracilis* (Oakes?).
1134. *Poa pratensis*, L.
1135. *Poa trivialis*, L.
1136. *Poa sylvestris*, Gray.
1137. *Poa flexuosa*, Muhl.
1138. *Poa brevifolia*, Muhl.
1139. *Eragrostis reptans*, Nees.
1140. *Eragrostis poaeoides*, Beauv.
1141. *Eragrostis poaeoides*, Beauv., var. *megastachya*, Gray.
1142. *Eragrostis Frankii*, Meyer.
1143. *Eragrostis Purshii*, Schrad. (?)
1144. *Eragrostis capillaris*, Nees.
1145. *Eragrostis pectinacea*, Gray.
1146. *Festuca Myurus*, L.

- 1147. *Festuca tenella*, Willd.
- 1148. *Festuca ovina*, L.
- 1149. *Festuca elatior*, L.
- 1150. *Festuca nutans*, Willd.
- 1151. *Bromus secalinus*, L.
- 1152. *Bromus racemosus*, L.
- 1153. *Bromus mollis*, L.
- 1154. *Bromus ciliatus*, L.
- 1155. *Bromus ciliatus*, L., var. *purgans*, Gray.
- 1156. *Bromus sterilis*, L.
- 1157. *Uniola latifolia*, Michx.
- 1158. *Uniola gracilis*, Michx.
- 1159. *Lolium perenne*, L.
- 1160. *Triticum repens*, L.
- 1161. *Elymus Virginicus*, L.
- 1162. *Elymus Canadensis*, L.
- 1163. *Elymus striatus*, Willd.
- 1164. *Elymus striatus*, Willd., var. *villosus*, Gray.
- 1165. *Gymnostichum Hystrix*, Schreb.
- 1166. *Danthonia spicata*, Beauv.
- 1167. *Trisetum palustre*, Torr.
- 1168. *Aira flexuosa*, L.
- 1169. *Aira caryophylllea*, L.

- 1170. *Holcus lanatus*, L.
- 1171. *Anthoxanthum odoratum*, L.
- 1172. *Phalaris Canariensis*, L.
- 1173. *Paspalum setaceum*, Michx.
- 1174. *Paspalum læve*, Michx.
- 1175. *Panicum filiforme*, L.
- 1176. *Panicum sanguinale*, L.
- 1177. *Panicum anceps*, Michx.
- 1178. *Panicum agrostoides*, Spreng.
- 1179. *Panicum proliferum*, Lam.
- 1180. *Panicum capillare*, L.
- 1181. *Panicum virgatum*, L.
- 1182. *Panicum latifolium*, L.
- 1183. *Panicum latifolium*, L., var. *molle*, Vasey. n. v.
- 1184. *Panicum clandestinum*, L.
- 1185. *Panicum microcarpon*, Muhl.
- 1186. *Panicum viscidum*, Ell.
- 1187. *Panicum pauciflorum*, Ell.
- 1188. *Panicum dichotomum*, L.
- 1189. *Panicum depauperatum*, Muhl.
- 1190. *Panicum verrucosum*, Muhl.
- 1191. *Panicum Crus-galli*, L.
- 1192. *Panicum Crus-galli*, L., var. *hispidum*, Gray.
- 1193. *Setaria verticillata*, Beauv.

- 1194. *Setaria glauca*, Beauv.
- 1195. *Setaria viridis*, Beauv.
- 1196. *Cenchrus tribuloides*, L.
- 1197. *Tripsacum dactyloides*, L.
- 1198. *Erianthus alopecuroides*, Ell.
- 1199. *Andropogon furcatus*, Muhl.
- 1200. *Andropogon scoparius*, Michx.
- 1201. *Andropogon argenteus*, Ell.
- 1202. *Andropogon Virginicus*, L.
- 1203. *Andropogon macrourus*, Michx.
- 1204. *Sorghum nutans*, Gray.
- 1205. *Juniperus Virginiana*, L.
- 1206. *Pinus rigida*, Miller.
- 1207. *Pinus pungens*, Michx.
- 1208. *Pinus inops*, Ait.
- 1209. *Pinus mitis*, Michx.
- 1210. *Pinus Strobus*, L.
- 1211. *Tsuga Canadensis*, Carrière.
- 1212. *Equisetum arvense*, L.
- 1213. *Equisetum hyemale*, L.
- 1214. *Polypodium vulgare*, L.
- 1215. *Cheilanthes vestita*, Swartz.
- 1216. *Pellaea atropurpurea*, Link.

- 1217. *Pteris aquilina*, L.
- 1218. *Adiantum pedatum*, L.
- 1219. *Woodwardia angustifolia*, Smith.
- 1220. *Woodwardia Virginica*, Smith.
- 1221. *Asplenium Trichomanes*, L.
- 1222. *Asplenium ebeneum*, Ait.
- 1223. *Asplenium angustifolium*, Michx.
- 1224. *Asplenium thelypteroides*, Michx.
- 1225. *Asplenium Filix-fœmina*, Bernh.
- 1226. *Camptosorus rhizophyllus*, Link.
- 1227. *Phegopteris hexagonoptera*, Fee.
- 1228. *Aspidium Noveboracense*, Swartz.
- 1229. *Aspidium Thelypteris*, Swartz.
- 1230. *Aspidium cristatum*, Swartz.
- 1231. *Aspidium Goldianum*, Hook.
- 1232. *Aspidium Filix-mas*, Swartz.
- 1233. *Aspidium marginale*, Swartz.
- 1234. *Aspidium spinulosum*, Swartz, var. *intermedium*, Willd.
- 1235. *Aspidium acrostichoides*, Swartz.
- 1236. *Cystopteris fragilis*, Bernh.
- 1237. *Onoclea sensibilis*, L.
- 1238. *Woodsia obtusa*, Torr.
- 1239. *Dicksonia pilosiuscula*, Willd.

- 1240. *Lygodium palmatum*, Swartz.
- 1241. *Osmunda regalis*, L.
- 1242. *Osmunda Claytoniana*, L.
- 1243. *Osmunda cinnamomea*, L.
- 1244. *Botrychium ternatum*, Swartz, var. *obliquum*, Milde.
- 1245. *Botrychium ternatum*, Swartz, var. *dissectum*, Milde.
- 1246. *Botrychium Virginianum*, Swartz.
- 1247. *Ophioglossum vulgatum*, L.
- 1248. *Lycopodium lucidulum*, Michx.
- 1249. *Lycopodium dendroideum*, Michx.
- 1250. *Lycopodium complanatum*, L.
- 1251. *Lycopodium complanatum*, L., var. *sabinæfolium*, Spring.
- 1252. *Selaginella rupestris*, Spring.
- 1253. *Selaginella apus*, Spring.
- 1254. *Sphagnum cymbifolium*, Dill.
- 1255. *Sphagnum squarrosum*, Pers.
- 1256. *Sphagnum acutifolium*, Ehrh.
- 1257. *Sphagnum cuspidatum*, Ehrh.
- 1258. *Andræa rupestris*, Turner.
- 1259. *Phascum sessile*, Br. & Sch.
- 1260. *Phascum cohærens*, Hedw.
- 1261. *Phascum triquetrum*, Spruce.
- 1262. *Phascum cuspidatum*, Schreb.

- 1263. *Phascum alternifolium*, Brid.
- 1264. *Phascum subulatum*, Schreb.
- 1265. *Phascum Sullivantii*, Schimp.
- 1266. *Bruchia flexuosa*, Schwaegr.
- 1267. *Weisia viridula*, Brid.
- 1268. *Trematodon longicollis*, Rich.
- 1269. *Dicranum varium*, Hedw.
- 1270. *Dicranum heteromallum*, Hedw.
- 1271. *Dicranum scoparium*, L.
- 1272. *Ceratodon purpureus*, Brid.
- 1273. *Leucobryum glaucum*, Hampe
- 1274. *Leucobryum minus*, Hampe.
- 1275. *Fissidens minutulus*, Sulliv.
- 1276. *Fissidens osmundioides*, Hedw.
- 1277. *Trichostomum pallidum*, Hedw.
- 1278. *Trichostomum glaucescens*, Hedw.
- 1279. *Barbula unguiculata*, Hedw.
- 1280. *Barbula cæspitosa*, Schwaegr.
- 1281. *Pottia truncata*, Br. & Sch.
- 1282. *Tetraphis pellucida*, Hedw.
- 1283. *Drummondia clavellata*, Hook.
- 1284. *Orthotrichum Canadense*, Br. & Sch.
- 1285. *Schistidium apocarpum*, Br. & Sch.

- 1286. *Grimmia Pennsylvanica*, Schwaegr.
- 1287. *Racomitrium fasciculare*, Brid.
- 1288. *Hedwigia ciliata*, Ehrh.
- 1289. *Diphyscium foliosum*, Web. & Mohr.
- 1290. *Atrichum undulatum*, Beauv.
- 1291. *Atrichum angustatum*, Beauv.
- 1292. *Pogonatum brevicaule*, Brid.
- 1293. *Pogonatum urnigerum*, Brid.
- 1294. *Polytrichum commune*, L.
- 1295. *Polytrichum juniperinum*, Hedw.
- 1296. *Aulacomnium heterostichum*, Br. & Sch.
- 1297. *Bryum pyriforme*, Hedw.
- 1298. *Bryum Wahlenbergii*, Schwaegr.
- 1299. *Bryum argenteum*, L.
- 1300. *Bryum pseudo-triquetrum*, Schwaegr.
- 1301. *Bryum caespitium*, L.
- 1302. *Mnium stellare*, Hedw.
- 1303. *Mnium Drummondii*, Br. & Sch.
- 1304. *Mnium cuspidatum*, Hedw.
- 1305. *Bartramia pomiformis*, Hedw.
- 1306. *Bartramia fontana*, Brid.
- 1307. *Funaria hygrometrica*, Hedw.
- 1308. *Physcomitrium pyriforme*, Br. & Sch.

1309. *Physcomitrium hians*, Lind.
1310. *Fontinalis biformis*, Sulliv.
1311. *Leucodon julaceus*, Sulliv.
1312. *Dichelyma subulatum*, Myrin.
1313. *Leptodon trichomitrium*, Mohr.
1314. *Anomodon attenuatus*, Hub.
1315. *Leskea obscura*, Hedw.
1316. *Leskea rostrata*, Hedw.
1317. *Thelia hirtella*, (Hedw.) Sulliv.
1318. *Thelia asprella*, (Schimp.) Sulliv.
1319. *Pylaisæa intricata*, Bryol. Europ.
1320. *Platygyrium repens*, Bryol. Europ.
1321. *Cylindrothecium cladorrhizans*, Bryol. Europ.
1322. *Cylindrothecium seductrix*, Bryol. Europ.
1323. *Climacium Americanum*, Brid.
1324. *Hypnum tamariscinum*, Hedw.
1325. *Hypnum triquetrum*, L.
1326. *Hypnum splendens*, Hedw.
1327. *Hypnum hians*, Hedw.
1328. *Hypnum Sullivantii*, Spruce.
1329. *Hypnum strigosum*, Hoffm.
1330. *Hypnum piliferum*, Schreb.
1331. *Hypnum Boscii*, Schwaegr.

- 1332. *Hypnum serrulatum*, Hedw.
- 1333. *Hypnum deplanatum*, Sch.
- 1334. *Hypnum rusciforme*, Weis.
- 1335. *Hypnum recurvans*, Schwaegr.
- 1336. *Hypnum Schreberi*, Willd.
- 1337. *Hypnum stramineum*, Dickson.
- 1338. *Hypnum uncinatum*, Hedw.
- 1339. *Hypnum fluitans*, L.
- 1340. *Hypnum cupressiforme*, L.
- 1341. *Hypnum curvifolium*, Hedw.
- 1342. *Hypnum pratense*, Koch.
- 1343. *Hypnum salebrosum*, Hoffm.
- 1344. *Hypnum lætum*, Brid.
- 1345. *Hypnum hispidulum*, Brid.
- 1346. *Hypnum radicale*, Brid.
- 1347. *Hypnum orthocladon*, Beauv.
- 1348. *Hypnum riparium*, Hedw.
- 1349. *Hypnum Lescurii*, Sulliv.
- 1350. *Hypnum fulvum*, Hook. & Wils.
- 1351. *Hypnum sylvaticum*, L.
- 1352. *Riccia lutescens*, Schw.
- 1353. *Anthoceros punctatus*, L.
- 1354. *Marchantia polymorpha*, L.

- 1355. *Fegatella conica*, Corda.
- 1356. *Metzgeria furcata*, Nees.
- 1357. *Aneura palmata*, Nees.
- 1358. *Steetzia Lyellii*, Lehm.
- 1359. *Pellia epiphylla*, Nees.
- 1360. *Geocalyx graveolens*, Nees.
- 1361. *Chiloscyphus polyanthos*, Corda.
- 1362. *Lophocolea bidentata*, Nees.
- 1363. *Jungermannia trichophylla*, L.
- 1364. *Jungermannia setacea*, Weber.
- 1365. *Jungermannia connivens*, Dickson.
- 1366. *Jungermannia Schraderi*, Martius.
- 1367. *Scapania nemorosa*, Nees.
- 1368. *Plagiochila spinulosa*, Nees & Montagne.
- 1369. *Plagiochila asplenoides*, Nees & Montagne.
- 1370. *Frullania Grayana*, Montagne.
- 1371. *Frullania Virginica*, Lehm.
- 1372. *Frullania Eboracensis*, Lehm.
- 1373. *Lejeunia cucullata*, Nees.
- 1374. *Madotheca platyphylla*, Dumort.
- 1375. *Radula complanata*, Dumort.
- 1376. *Ptilidium ciliare*, Nees.
- 1377. *Trichocolea Tomentella*, Nees.

1378. *Mastigobryum tridenticulatum*, Lindenb.
1379. *Lepidozia reptans*, Nees.
1380. *Calypogeia Trichomanis*, Corda.
1381. *Nitella flexilis*, L.
1382. *Nitella tenuissima*, Desv.
1383. *Chara polyphylla*, var. *Michauxii*, Al. Braun.
1384. *Chara Hydropithys*, Al. Braun



APPENDIX.

SUGGESTIONS TO BEGINNERS.

More fully to complete the primary design of this little work, viz., that of making it serve as a guide to collectors in the vicinity of Washington, I have deemed it appropriate to append to the foregoing catalogue and introductory remarks a very condensed description of the methods of collecting and preserving botanical specimens. It is probable that besides the occasional visits of botanists from other parts of the country, and those who may hereafter remove from other places to Washington and desire to continue, as all botanists do, their herborizations in their new home, for which two classes this treatise has been chiefly designed, there will in the future be some, and it is to be hoped many, who will commence their botanical career in this place, and for whom, therefore, this Appendix may possess a certain value. Should the effort to introduce botany into the public schools be seriously made and persevered in, an interest in the local flora will be rapidly awakened among the resident population, and there will exist a demand for some work bearing especially upon it, and also for a treatise on the art of collecting. It may be said that directions and instructions of this kind already exist, and are to be found in nearly all the school manuals. This is true, and yet I think no experienced collector will gainsay the statement that the greater part of the instructions given in text-books are soon disregarded as impracticable, and different, though far from uniform, methods are adopted by practical botanists. It is not my purpose, nor would space permit me, to criticise these book-systems, or to compare them with the one here recommended. This any one may do for himself. I propose simply to explain a practical method, but latitudinarian in scope, which, if followed more or less closely, will yield satisfactory results. This may be and is widely varied in its details, but in its general character it can be regarded as the accepted method of most botanists of field experience. To avoid too lengthy and profuse explanations, I shall in the main confine my suggestions to

the line of operation which considerable experience and the temporary adoption of numerous different methods have finally convinced me to be upon the whole the best, although the circumstances may often so vary as to render considerable modification advisable. Such modifications will, however, usually suggest themselves, and choice methods will occasionally be introduced as equally advantageous or widely in use.

I.—IDENTIFICATION OF PLANTS.

I place the identification before the collection of plants because for the beginner it should be chronologically the first thing done. Not that plants are to be studied altogether *in situ* without removing them from their natural attachments to the soil, for this can be done without properly *collecting* them. The term "collection" should be regarded as a technical one, and by no means the same thing as the mere gathering of flowers. It is an *art*, like every other step in practical botany, and requires skill, which is greatly increased by experience; and here the general advice may be given to beginners in botany not to attempt to make a collection of plants the first year, and perhaps not the second. Those who begin by trying to preserve everything they get from the first, usually find after a few years of experience that they have wasted much time and labor, as well as money, for a well-arranged herbarium is a source of considerable expense. They find that they have lost time in drying and mounting specimens which are sure to be, if retained, an eye-sore to their better educated taste, and which they nevertheless feel loth to throw away along with the sheets to which they are attached, after having devoted so much time and labor to their preservation. Mistakes of this kind will inevitably occur as a necessary part of experience in learning, but a large portion of the waste which they occasion can be avoided by a little patience in the commencement of the work.

It is, of course, a good plan to do as large a part as possible of the work of analyzing flowers in the field, where they may be examined in their natural state of turgescence and with all their organs in their functional positions. In this condition the relations of the parts may be much more clearly seen, and the whole work of identification is greatly simplified. But it is never possible to do everything in this way. Few have the leisure to spend whole days in the country for the study of flowers, and if any had there would still be parts of the work which could be much better done in a quiet room surrounded by the

requisite appliances, even where it is necessary to work at wilted and compressed specimens.

I need not say that a good microscope is indispensable, or repeat the caution about supposing that a high power is required. It is well to have one with two or three lenses of different powers, and which may be combined for very minute objects. What is known as the "Gray microscope" is amply sufficient, and with certain improvements is about all that is needed for systematic analysis. It should always be carried in the pocket, separated, if need be, from the box that it comes in, and which is used as a stand. Every botanist should have a pocket made expressly for his glass, and should never be without it wherever he may be. It is a great advantage to have a surface of some considerable extent in front of the stand for the instrument and on a level with the slide on which the object is to be placed. This is secured in the simplest manner by laying down a book of the right thickness and using a large piece of tin or sheet-iron in place of the glass slide usually provided. Upon this a whole plant of considerable size may be placed, and the portion to be investigated brought under the glass. The steel needles with handles, which usually accompany microscopes of this class, are useful, but if broken or lost an excellent substitute is a thorn, either from the cockspur thorn (*Crataegus Crus-galli*), or from the honey locust (*Gleditschia triacanthos*). These wooden needles have the advantage over steel ones that when wet they do not so persistently pick up the small seeds, etc., which it is desired to put into position.

A young botanist's struggles with botanical keys can only be sympathized with; they can scarcely be aided by any general directions, and there is no more effectual drill than the persevering effort to identify, by the aid of a key, a plant to which he has no clew. It should be the ambition of every such beginner to analyze in this manner all the plants of his local flora. The more aid he receives from those who already know their names and tell them to him, the more superficial will his knowledge of botany be. It is the duty of his teacher, if he has one, to give such suggestions as will guide him over the worst obstacles and prevent discouragement, but he should never be told what his plant is. In finding out the name of a plant for himself he must necessarily learn much of its nature, and this information he will never again take the trouble to acquire after he has once come into possession of the object sought, *i. e.*, its name. When he has learned this he imagines that he *knows what the plant is*, and yet he does not really know what it is until

he has studied its parts and through this real knowledge of the plant obtained the comparatively unimportant knowledge of its name; and thus we reach the paradox that the more ignorant the beginner is at the outset, and the less he is helped, the better will be his ultimate acquaintance with botany if he perseveres in the work.

2.—COLLECTION OF PLANTS.

As already remarked, it is an art to collect plants properly. As regards their collection, plants may be divided into two general classes: herbaceous and shrubby plants. All herbs of moderate size and height should be collected entire. It is not sufficient to break or cut them off at such a point on the stem as will insure a specimen of the proper length. Every part of a plant has a character of its own and one which should be represented in the collection. The leaves of most herbs vary in form at different points on the stem, and the same is generally true of the degree of pubescence, which is a character of the first importance. Even the dead leaves about the base are distinctive and should never be torn off. If radical leaves exist, they should be collected with great care, and to secure these it is often necessary to collect them at a different time of the season from that in which the flowers are obtained. No part of the plant is more characteristic than its root. It must not be forgotten that every plant, except epiphytes and parasites, has a subterranean as well as an aerial portion, and where only one is exhibited but half of the plant is represented. Of course there are many plants, even herbaceous ones, whose roots cannot be reduced to dimensions adapted to a herbarium, but wherever it is possible, the entire specimen, root and stem, should be secured. Much larger plants may be thus collected than is often supposed possible, as will be explained presently.

For large herbs with spreading branches the best that can be done is to collect the flowering portions in specimens of suitable size and supplement them with leaves selected from lower parts of the stem.

As regards shrubby plants and trees, the flower and leaf-bearing twigs should be collected, and if the leaves vary on different parts of the plant the different forms should be collected. Occasionally it is desirable to strip off a portion of the bark as a distinctive part of the species in question.

The representative parts of every plant are flowers, fruit, and leaves, and no specimen can be regarded as complete without all these parts.

Often, as in many *Cruciferae*, all these can be found combined in the same specimen at once, but in most cases it requires at least two separate collections at different times in the season. Where fruit can be found attached to the stem and leaves, this is of course the preferable way, since it leaves no possible doubt as to the identity of both. This should therefore be done as long as the size of the fruit will permit, and is recommended in the case of all acorns, and even in hickory-nuts. In the case of larger fruits, such as the walnut, the crab-apple, or the persimmon, the fruit can be collected separately, properly labeled, and kept in drawers or boxes.

The essential apparatus for collecting consists of a portfolio and a small garden trowel. In place of the latter a very large, stout knife may be used, but the results are far less satisfactory. The former is quite indispensable. The traditional tin box of the school books is now generally rejected except for mosses and certain aquatics, when it is made to carry over the shoulder by means of a strap. The beginner will have no use for it. Portfolios are variously made, usually 12 by 18 inches in size and admitting of being expanded to the thickness of 3 or 4 inches, and having handles with which to carry them in the hand, and often also straps and buckles for carrying them over the shoulders. They should be partially filled with paper, which, when once folded, shall be of nearly the same size as the portfolio, either sewed to the back or held there by some other device. Various attempts have been made to invent a suitable form of portfolio, some of which embody valuable suggestions, but the greater part of which are specious impostures calculated to tempt the uninitiated, who, after having invested in them, throw them aside the next season for something more simple and practical. Nothing can be more ridiculous than some of these patent impositions which are widely advertised and puffed in the newspapers and even in scientific periodicals. I have one in mind now which, among other absurdities, had arrangements for the systematic classification and permanent labeling of the specimens as soon as collected! No attempt need be made to keep a portfolio genteel, especially within. By the time it has been well filled out a few times with moist plants and muddy roots, all the fancy paper that is put into it will have lost its charm. No delusion is greater, either, than that, by having wire for the sides, or no matter how bibulous paper inside, the necessity for taking the plants out of the portfolio and putting them through the regular process of drying can be obviated. Those who believe these things merely ruin a few col-

lections, and awake to the real facts of the case. The portfolio may, therefore, be quite a rude affair. Any paper that is put into it is destined to get wet and torn and to require renewal several times a season, and it should, therefore, be cheap. It is always best to take the plants out as soon as possible after returning home. It is not necessary, therefore, that the paper have great absorbing qualities. It is more important that it be strong and tough, and this kind is in reality the most economical. Moderately thick and firm manila paper is, therefore, upon the whole recommended. One fact it is important to bear in mind relative to the portfolio. A plant once placed in it should never be allowed to stir afterwards until it is ready to be taken out. If it moves about or drops down upon the back of the portfolio, the leaves and flowers will become so completely wrinkled and disorganized as to be incapable of preservation. The pressure once upon it must not be relaxed. This has been a source of much difficulty, and several kinds of appliance for obviating it have been devised. Of these the best is probably that of two broad elastic straps from the two outer corners of one side, which can be carried over the leaves in which plants have been placed and attached to a ring at the center of the back by means of a snap. And yet even this form is open to objections. The time required to adjust it, though brief, involves delay in collecting, and it is liable to get out of order. I think it safe to say that practical experience in the majority of cases ultimately leads to the rejection of all such devices. I have myself for several years used nothing but an old book, 16 inches long by 10 wide, with some of the leaves left in, which I carry with my hand upon the front edge, holding the covers together. An India-rubber band around both covers is an excellent auxiliary where any considerable interval elapses between the times of collecting specimens, and it is often very convenient to put one longitudinally around one of the covers and the leaf next to the last specimen collected, which can remain, and answers the purpose of the elastic straps of the device described above. It may be added that nothing is more convenient than a small pocketful of these rubbers, which, one finds, may be used in a thousand unthought-of ways.

Besides the portfolio, the trowel, and the glass, a collector should always carry a good knife for trimming branches from trees and shrubs and for many other purposes. He should also have a tape-line, which, for measuring girths, etc., is much better than a rule, and should be of the kind that wind up with an internal spring and are not encumbered

by a crank. He should never be without twine or some kind of string, and ought to be provided with a few tags with metallic eyelets for marking the exact localities of plants which he wishes to find again. A small field-glass or spy-glass will be found a useful thing, not only in often aiding him to orient himself in his prolonged rambles in unaccustomed parts of the country, and in affording him the greatly increased pleasure of viewing his distant surroundings from certain commanding positions in which he will sometimes suddenly and unexpectedly find himself, but also as a legitimate aid in collecting; as where he desires to know in advance whether a tree contains specimens worth climbing it for, or whether a flower across a stream is familiar or new to him. An ordinary opera-glass will answer this purpose, but a stronger power is better, and may be had without increase of size if the proper search is made at the optician's.

Last, but not least, the collector needs a drinking-cup. It should fold up for the pocket, and the metallic kind is too cumbersome. Either a cup of pure rubber, that can be wadded together, or the leather kind, that folds regularly into the form of a thin, stiff card (which is the best form), should be looked for. These articles, with a memorandum book or block and a pencil or fountain pen, complete the necessary outfit of a botanist, and anything greatly in excess of these will be pretty sure to be found an encumbrance rather than aid.

For most herbaceous plants enough has already been said to guide the beginner in securing good specimens. Nearly all botanists take a pride in this, and aside from its purely esthetic aspect, it is of the first scientific importance. The plant should in all cases be represented, and as art only aims to imitate nature, so good taste coincides with the scientific requirement that the plant after collection shall resemble as nearly as possible the plant before collection.

Small annuals growing in loose soil can usually be pulled up by the roots without injury to the latter, and this is then the best course; but if the plant is very rare it is best not to trust to this, for fear of injuring the only specimen. It is but the work of a moment to insert the trowel below it and carefully shake the roots clean. Nearly all biennials and perennials require to be dug up, but this will be found less labor than might be supposed. A little practice will render any one skilled enough to take up nearly all ordinary plants with one or two strokes of the trowel. As it is impossible to tell in which direction a horizontal rhizoma may extend, it is best to strike in at some distance from the

base of the plant and at a considerable angle, so as to go beneath it. If it cannot be raised upon the trowel at the first thrust, make a similar one on the opposite side, meeting the former. In soddy ground it is often necessary to cut out a conical clod, with the plant in its center, and then remove the earth from the roots after it is taken out of the ground. This is frequently the case with *Carices*, which should never be broken off at the top of the ground.

In placing plants in the portfolio it is usually worth while to take a little pains with them. They will never again be as firm and easily placed, and if the above directions about not allowing them to move afterwards are followed, it will be found that every minute so employed will save many at the second handling. Still there is a limit of economy in this, and in many cases it is full as well to pay no further attention to the specimens than to see that they are snugly inclosed in the folds of the book. No ends should, under any circumstances, be allowed to project. Whatever portion does so is sure to be ruined; for, in the first place, it is exposed to the air and sun and dries up, and in the second place it is certain to rub against bushes and other objects and be torn and bruised. The specimens must go wholly inside the portfolio. This suggests a remark upon specimens longer than the book they are to be placed in. How is this to be done? If only a little less than twice the length, a bend in the middle is the thing required. But do not guess at the middle; place the full-lengthed plant upon the book; see that one end clears by at least an inch; then bend the stem over your finger an inch from the other end. If the stem is disposed to break, bend it over a larger object, as your knee or the palm of your hand. If it breaks, this cannot be helped, and does not materially detract from the value of the specimen. Keep the parts always together as if it had not broken. If the specimen is too long for one length, but less than twice the required length, do not bend it in the middle but nearest one end, so as to maintain the proper length. In most cases the upper should be the short end and naturally droop or lop over, but occasionally it is better to bend next the base. For specimens of more than two lengths two bends are necessary. These should be made with care in two respects: first, to see that the bends are *in the same plane*, *i. e.*, that they be so made that all three of the parts of the specimen will lie side by side upon a level surface, and, secondly, to see that they are in *opposite directions*, zigzag, or like the letter N. If care is taken in this latter particular, a three-lengthed specimen may be made to look

better than a two-lengthed one. The basal and upper sections will be upright on the sheet and be nicely joined by the middle section, forming a diagonal between them. This is as far as the process of bending usually need be carried. Plants more than four feet high are generally too large to collect entire. But sometimes it becomes important to give a specimen still a third bend, and this I very frequently do. The rule of making each angle the opposite of the one next to it must, however, be strictly adhered to in these as in all other cases, otherwise parts of the stem will be across each other and spoil the specimen. Neither must the idea be entertained that this is a matter that can be attended to afterwards; it must be correctly done in the field, and mistakes in measurements of lengths or in direction of bending can never be properly remedied in the herbarium. It is a good rule always to make specimens ample; there is more danger of getting them too meager than too full, and any one who tries some of these feats at collecting large plants entire will, afterwards, when they are dry and put away, wonder every time he sees them how small a compass they have come to occupy and what respectable-sized specimens they are.

It is never a good plan to put two different plants between the same two leaves of the portfolio. The leaves adhere to each other and become doubled, wrinkled, and matted in the effort to separate them. If the portfolio has not leaves enough to hold all the collections of a day, this of course may become necessary; but this contingency should be prevented in advance. An excellent idea is to have a portion of the book consist of firm tissue-paper, which, though not convenient for regular use, is far better than the doubling of specimens, and from the small space it occupies may be carried in sufficient quantities for an abundant reserve in any emergency.

It is better to have a systematic method in filling the portfolio during the excursion. The plants should be placed next to one another between successive leaves, and not put in at random. This, besides giving an idea of the capacity of the portfolio at any time, and showing how much has been done, is a great help in finding unoccupied space, which, when the book becomes nearly full, is very difficult where empty leaves are as likely to occur in one part as in another. But there is still another and probably greater advantage in this systematic way of collecting. It serves as an excellent memorandum of localities, etc., after getting home. I do not recommend writing labels in the field, although some do so, and it is really not to be condemned; but if your

specimens are located in your portfolio in the chronological order of their collection and you label them immediately after reaching home, there will never be any doubt as to the locality or any of the important attendant circumstances, such as you will wish to record on your label.

This latter consideration suggests a final observation relative to the collection of plants, viz., that of taking notes. There are certain facts which it is necessary to note down in the field, and this should always be done, leaning in the direction of making the record, even though you may doubt whether it is worth the trouble; still, in botany note-taking is probably less necessary than in almost any other branch of natural science, since the objects upon which you would comment are usually carried home, where the facts may be more thoroughly observed and more fully and accurately described.

Much better than the field note-book, though to some extent dependent upon this, is the botanical diary or journal, in which are recorded, after returning from each excursion, all the facts of interest observed during the day. This should be written up as soon as the day's collection is disposed of, from notes made in the field or while analyzing the plants, or from memory of the less specific events. The habit of noting down variances from the descriptions in the books while identifying the specimens is to be highly commended as leading to exact observation, and a botanist should think while he works, and inquire after the causes of phenomena, for there is a deep biological significance in every morphological peculiarity.

The beginner will do well, say the second year, to commence a private local catalogue in a separate book for the purpose, numbering each species as he identifies it. This catalogue will inevitably contain many mistakes and duplications, but it will always be very useful as well as interesting.

3.—PRESERVATION OF PLANTS.

The next step in the botanist's work is to preserve the specimens which he has collected. They should not be allowed to lie in the portfolio over night, but if it is impossible to attend to them all, then as many should be pressed as possible, beginning with those first collected (and this is another advantage in a methodical way of filling the portfolio). Those last collected may perhaps lie till the next morning, but if of a tender character or very juicy, it is best to slip in a dry paper on both sides of each specimen. If any require further study, and have to be left in the portfolio for this purpose, it is as well to abandon the hope

of saving these, and to press only a part of what has been collected, for several specimens of everything should be taken if they can be found. A temporary label should be written for each plant as it is reached, placed with it, and kept with it throughout. If there is more than one specimen, the temporary label will be needed for the duplicates when the other specimen is mounted. The label should give the Latin name of the plant, if known, or if only the generic name is known, then this should be written, the date of collection, and the particular locality, both habitat and station, or at least the latter. Any special fact observed in connection with the plant may also be written on the label. This done, the next step is to press the specimens.

The following is my own method of pressing plants:

The press consists of two pine boards 1 inch thick, 12 inches wide, 18 inches long, and dressed, having each two cleats on one side, one across near each end. Upon one of these a pile of plants is built. For drying paper, after trying many different kinds, I have finally adopted ordinary cheap brown wrapping-paper. The size used is 10 by 16 inches. It would perhaps be better to be larger. The double sheets (two leaves) are kept separate, by which means the thickness between each specimen may be varied *ad libitum*. Four or five sheets is the usual thickness for ordinary plants. These are placed upon the lower press-board (cleat side down), and upon them is laid a sheet of thin white paper a little larger than the brown paper. This paper is a firm but very thin manila, a little heavier than tissue-paper, but good tissue-paper would answer. Upon this sheet, which is single, the plant to be pressed is laid; its leaves are laid out neatly, and all its parts are placed in the position in which it is desirable for them always to remain. This done, a second sheet of thin white paper is laid over the plant; then another layer of four or five double sheets of the brown paper is laid on. Upon this another sheet of white paper is then laid, another specimen placed upon it and arranged for final disposition, another sheet of white paper laid over that, and another layer of brown paper upon that. This process is continued until the portfolio is emptied.

Several things are to be observed as the work of preparing the specimens for pressure progresses. The amount of brown paper used should be made to vary somewhat according to the nature of the plant. Grasses and grass-like plants require much less; succulent plants require more; thick-stemmed plants need thick layers of paper, more to preserve the even surface of the pile than on account of the amount

of moisture they exude. The pile should not be made too large, else after pressure it becomes very irregular. To obviate this and at the same time not require extra presses where the collection is large, boards without cleats and of about the size of the brown paper are occasionally inserted, and the pile continued upon these as upon the original press-board.

It often happens that the natural elasticity of freshly-collected plants renders them somewhat unmanageable, so that when laid in the desired position they refuse to remain so. In such cases the best mode of procedure is first to lay them out as well as possible and put on the white, and the layer of brown paper, and then, after this is done, placing one hand on one end of the pile and gently pressing, lift the brown and white paper with the other at the other end and roll them back. Then while holding these with one hand the refractory parts of the plant may be put in position with the other, and by beginning this operation near the middle and gradually unrolling the paper so as to let it come down upon and hold all that has been gained, one-half of the specimen may be forced to remain in its proper position. After this, the other end may be lifted in like manner, and the same process gone through with until any adjustments desired may be made and secured. This process, though somewhat awkward to describe, is in itself quite simple, and a little practice will render it easy. The results are in the highest degree satisfactory. Once properly placed, even the weight of the layer of brown papers is usually sufficient to prevent further movement, and the specimen then emerges from the press in fine condition.

All the plants being in, the next step is to put them under pressure. The other press-board is placed on the pile and a good trunk-strap put around the whole, drawn to the proper degree of tightness and buckled. How hard to press plants is still an unsettled question, and botanists differ widely upon it. My own experience has led me to make my first pressures quite light. I have lost many plants from too hard pressure at first, and while some will bear it, it is safest on the whole to avoid it. The easiest way to strap up a press full of plants is to place them on the floor and with the knee upon the upper board draw up the strap and buckle it. The buckle should be made to come on the side from you, and to be at first quite low down; as it is drawn it will rise, and should never be allowed to come up to the upper press-board. In case of large operations, two or three presses may be employed, and it is always well to have two at hand in case of need.

How long should plants remain in press? Never over twenty-four hours for the first time, and certain plants will suffer if left in so long. Much, however, depends upon the pressure. Those who press their plants hard must change them oftener. If the above suggestions are followed, it is best to change the driers at the end of twelve hours. The second time they may in most cases be allowed to remain in twenty-four hours; after this they should be changed every day for about four days. The pressure may be slightly increased after each change, and after the fourth it is usually safe and advisable to leave them in the press two days, then change and leave in two days more, under hard pressure, after which they may be taken out, the driers renewed, and the package laid aside for a week, with merely a board or a book upon it, to dry out. The plants will then be ready for the herbarium.

The process of changing the driers is more simple than that of pressing. The press is placed upon the table before you, a little to the right; the upper press-board is taken off and placed, cleats downward, on the table by the side of it, at the left; the package of dry brown paper lies on the left of these. A layer of these latter is placed on the empty press-board as in the case of pressing the plants; the upper layer of damp ones is taken from the package and laid by the side of it, at the right (a table at least five feet long is required); then the top specimen in its two sheets of white paper is carefully taken off, without disturbing the plant, and placed on the layer of dry papers. A new layer of dry papers is then placed over these, the second layer of wet ones removed from the package, and the second plant transferred in the same manner as before to the new package. This process is continued until all the plants are transferred from wet to dry papers. No amount of curiosity should tempt you to remove the upper white paper to look at a specimen. After a plant has been placed between thin papers it should never again be in the least disturbed until it is fully dry. The access of the air and the separation of the leaves and flowers from the intimate contact which pressure gives them with the thin sheets deadens the lively color which the plants otherwise will preserve, and injures the specimens. The thin paper is no perceptible obstruction to the passage of the moisture from the plant to the driers. Some, instead of using two sheets, use one folded double sheet, but this makes the process of manipulation more difficult, without any corresponding advantage. The object in having them white and a little larger than the driers is to avoid overlooking them; if smaller than the driers, one is constantly

losing plants and having them turn up in an injured condition among the wet papers.

The differences in the nature of plants will render some additional precautions sometimes necessary. It is often well after the first changing to group into one place all the thick-stemmed specimens and give them more driers, or to group all the grasses, rushes, etc., by themselves, give them fewer driers, and perhaps change them less often. Some kinds of plants can with difficulty be pressed at all, and must be for the most part dried out between papers with scarcely any pressure. This is the best way with *Opuntia*, *Sedum*, *Portulaca*, etc. Others, like *Cynthia Dandelion*, are so full of juice that very light pressure seems to disintegrate the structure and turn the specimens black. There are a few plants, such as *Gerardia*, *Buchnera*, *Herpestis*, and *Baptisia*, which are said by the books to "turn black in drying," as though this would occur whatever plan might be adopted. To some extent this is true, and yet by the above method I have dried all these plants so that the green color largely predominates in the dried specimen.

I cannot advise the purchase of patent kinds of drying paper. I have tried the best of them, and, independently of cost, I prefer the straw paper. I have also heard other experienced botanists make the same admission. Simplicity and convenience are important objects to aim at, and for most botanists economy is equally so.

The drying of damp papers is always considerable trouble, and various devices for hanging them up on frames or "horses" built for the purpose have been used. These are well, but beginners will scarcely have them, and must resort to other methods. If you have a lawn, and the weather is fine, it is best to spread them out in the sun, where they will dry immediately. The thin brown papers here recommended dry much quicker than the thicker kinds sold, and if the pains are taken to open them entirely out, the process is still further hastened. If you have only in-door facilities, the papers may be spread out over the tables, chairs, and floor, where they will usually dry in a night or a day. It is a good plan to heat them in an oven after picking them up and before using. In throwing them down they will dry faster if no effort is made to lay them in any systematic way, and no evils need be feared from their becoming rolled up and wrinkled, as this only increases the surface for the access of the air. They should, however, be picked up systematically, keeping the ends even; otherwise, they will consume much time when needed for rapid use, where they must often be picked up with one hand while the other is doing something else.

After the plants have lain a week without pressure and become thoroughly dry, they may be taken out of the driers and thin papers and placed in the herbarium. They are usually first transferred to rough paper of some kind, either double and placed between the folds, or, as I prefer, single, and simply laid on with their labels. System is useful in all things, and many valuable specimens will be saved by observing certain rules even in such simple matters as this. The papers upon which the specimens are placed should be ample, say 18 by 12, or at least 17 by 11 inches, and should be of uniform size. Many such papers will be in constant use in the herbarium, and a reserve package should be kept on hand. They need not generally be bought, as nothing is better than common newspapers, especially if the paper is moderately strong and heavy, and nearly every one has a surplus of these; but it is well worth while to cut them to a measure. In laying off the plants the thin papers should be systematically restored to their general package without having to move them twice, and the driers released for further use. Only one or two driers will be needed for each specimen after the last change, when they are laid away to dry out. It will often happen that there are several specimens of the same plant. Of course only one label is written for these, and, therefore, they must be kept together throughout. This will be secured if the plants are changed in the systematic manner described above; but the label will sometimes be found on the upper and sometimes on the under specimen when they finally come out from the press. In putting them away it is, of course, best in such cases to have the upper specimen contain the label.

A botanist's collection always consists of two departments: the *herbarium* proper and his *duplicates*. The former he arranges in strict botanical order, sees to it that it contains a perfect specimen fully represented of every plant he has ever collected, and adds to it as many other plants as he is able to obtain through the process of exchanging, or in any other way. The latter contains a large number of specimens of each of the rarer plants of his local flora, and eventually he will add to it other rare plants obtained from other sources. It does not aim at completeness, but simply to supply a foreign demand and serve as a means of increasing and enriching his herbarium proper. As this approaches completion, therefore, the other is reduced in volume.

In putting away the fully dried plants they are accordingly divided into these two classes, a part going into the herbarium and a part to the duplicates. Where several specimens of the same plant are col-

lected, which should only be done where the plant is in demand, all but one, of course, are relegated to the duplicate department, and usually without further ceremony. Specimens selected for the herbarium, however, require still another form of treatment. They must be *poisoned*. Let no one think that this can be dispensed with. As certain as that it requires the proper cycle of seasons for it to grow, so certain will the time come when if left unpoisoned it will be devoured by the insect pests of the herbarium. Neither lay the unction to your soul that this can be done after mounting, and thus waste neat and costly glazed paper by mounting them first. The insects naturally work on the under side of the plant, where the poison cannot be applied after it is down. The labor of poisoning is, perhaps, the least pleasant of all kinds of herbarium work, but its absolute necessity should at once dispel all hopes of evading it.

There is an almost complete uniformity among all botanists as to the kind of poison to be used, the accepted substance consisting of corrosive sublimate and alcohol, the proportion being one ounce of the former dissolved in one quart of the latter diluted fifty per cent. The mode of applying it varies considerably. The use of the camel's hair brush is slow and tedious, but consumes the least poison, and may be defended on economical grounds, though not likely to be as thorough as other methods. Probably the best way, all things considered, is first to fill a trough or large platter with the poison and then dip the entire plants in the liquid, handling them with tweezers, and letting them drip before laying them aside. After poisoning, they should be immediately placed in dry papers; otherwise all the pains taken to press them nicely will be in vain, and their colors will vanish after all. This can be prevented by care, and once changing will be sufficient. It is not necessary to use regular driers for this purpose. Newspaper is good enough, and it will be found very salutary to use, for drying out the poison, sheets of paper designed for the duplicate department or for general use. The habit of the insects is to bore through the sheets on which the plants are laid. They never go round the ends of them, but eat circular tubes downward or upward through the paper until they find a suitable habitat. If all the papers in the herbarium are saturated with the poison, they find themselves greatly restricted in their operations, and as it is not usually deemed worth while to poison duplicates, it is a great protection to them to have them in poisoned papers. The temporary label should be kept with the plant throughout the poisoning as throughout every other process.

4.—MAKING A HERBARIUM.

The poisoning of plants is the last strictly preservative process, and we are now ready to consider the more advanced stages of botanical work necessary to the orderly disposition of the plants identified, collected, and preserved.

The usual course, upon which no useful innovation can be here proposed, is to keep each genus, unless too large, in one folded sheet of very heavy paper, called the "genus-cover," to be labeled with the name of the genus on the lower left-hand corner, and to mount the plants on fine white paper, about 16 by 11 inches in size, and place these sheets in the genus-covers. The specimens thus prepared should be kept in the latest approved order according to the natural system of classification, in cases either permanently made for the purpose or portable. These cases should consist of partitions, 13, or better, 14 inches wide, 4 or 5 inches high, and 19 inches deep, arranged one above another in several vertical tiers; these dimensions to be all in the clear, and clear of door-jambs. The doors, which should consist as much as possible of glass, should, if practicable, be so hung that when swung back the edge will be flush with the inner vertical sides of the cases, *i. e.*, leaving no shoulder for the genus-covers to catch upon in drawing them out.

The labeling of the orders is somewhat difficult on account of the perpetually growing and changing character of the herbarium. If labels or tickets are attached to the edges of the shelves, they are sure to require removal in a short time, which disfigures the cases. The best arrangement known to me to avoid these consequences and label the families is that of portable *order-covers*. These consist of good, stiff boards (paste-board) of the same width as the genus-covers and a little longer, to one end of which flaps of the same material are attached by means of strong binder's muslin pasted to both pieces, so that when the large board lies on the package of genus-covers the flap will fall down over their ends and present a vertical surface, upon which the name of the order or orders in the package is placed. The flaps will be three or four inches wide and as long as the board to which they are attached is wide. In the course of time it will often happen that orders once placed in one partition and labeled on the flap will have to be taken out and put in another. In such cases the names must of course be erased from one flap and written on another. The principal objection to this system is that it requires time and trouble to remove the order-covers every time a plant is wanted. Upon the whole, it is perhaps better to do without

order-covers entirely until the herbarium becomes quite large and complete. If the plants are kept in the natural order, you will soon become so familiar with it that you will know within one or two partitions where any plant is at any time.

It is not a mere accident that I have mentioned the general character of the herbarium before mentioning the important process of *mounting* plants. This is the finishing stroke of the whole work and should not be hastily rushed into. A plant once mounted is generally fixed for all time, and this should presuppose that it is not only known botanically, but approved as a suitable specimen to adorn a cabinet. If rare, and not likely to be found again, of course it should be mounted, even though in itself imperfect, but in so far as the local flora is concerned, this is very seldom the case.

For these and other reasons I would advise the postponement of the work of mounting until after considerable experience has been acquired in collecting and in general herbarium work. Some botanists never mount plants. They urge with considerable force that this renders them incapable of further study or examination, which any plant is always liable to require. A specimen once mounted cannot be turned over for the purpose of seeing the other side, where the two sides differ, as is generally the case. To meet this objection, such plants when mounted must be in duplicate, or so much so as to exhibit both surfaces. In the case of ferns, for example, nothing less than the mounting of two entire specimens will generally suffice.

Plants may be nicely kept without mounting by placing them in double sheets of ordinary paper, and these in genus-covers the same as if mounted. For increased safety, the fold of the species-cover may be placed in the reverse position to that of the genus-cover. The name of the species may then be written on the species-cover or on a white slip and pasted on the outside of it, to save opening any that you may not wish to examine. No two species should ever be placed in the same cover, and where it is desired to preserve several specimens of the same species these may go inside the species-cover on separate sheets of paper.

The objection to this plan as a final one is that much handling, especially after the specimens become old, breaks them up and destroys them. It is also more trouble and requires more time to open the species-covers than to look at the mounted page. In the latter case there is a quick method of looking a large genus through as you would

a book. It is held in the two hands, with the right (open) edge elevated at an angle of about 45° from the table, and while the two thumbs rapidly separate the edges of the sheets from the upper towards the lower ones the eye glances at each label attached to the lower right-hand corner of each sheet until the plant sought is reached. This would scarcely be worth mentioning were it not for the fact, as every one will early find out, that by far the greater part of the references to the herbarium will be in search of species belonging to large genera. Very large genera should be divided and kept in several genus-covers, and it is an excellent plan to write on the outside the names of all the species in a genus-cover.

Upon the whole, then, it is doubtless best to mount the specimens of the herbarium, but this should not be undertaken at first or until considerable experience has rendered one skilled in selecting the very best specimens both from a scientific and an artistic point of view. A new beginner will never afterwards regret having waited at least three years before mounting any of his plants. By this time he will have seen many other herbariums and received the specimens of other older botanists in exchange to compare with his own, and will then possess some valuable ideas on the whole subject. This, therefore, though probably the most complicated part of a botanist's work, is, when thus viewed, the one upon which the least pains need be expended in describing the process, since if the proper course is pursued from the beginning he will be sure to have already picked up nearly all the needed information respecting it before he undertakes to apply it to his own collection.

The two principal methods of mounting may, however, be briefly described. These are, first, with glue, and, second, with gummed strips. In the first case a glue-pot of rather large size, say to hold a pint of glue, or larger, is required, and a soft flat brush, $1\frac{1}{2}$ to 2 inches in width, with which to spread the glue. The latter should be pure and white of the best quality. The glue is made very thin, so as to be in a free liquid state, and kept over a burner (gas-stove) at a temperature nearly boiling.* The plant is first placed on a rough paper with what is to be the upper side downward, and the glue is rapidly and dexterously spread thoroughly over every part of the side that is to go down. It is then immediately turned over and laid with precision upon the

*The use of fish-glue, which requires no heating, is recommended by some. Although I have not tried it, and therefore do not know the objections which may exist to its use, it is certain that if otherwise equally good this must be a very strong point in its favor.

sheet of glazed white paper which is ready at hand to receive it, and in the exact position previously determined to be the best. Each specimen should be first applied to the white sheet on trial for this purpose. A dry cloth is then used to remove any excess of glue that may have been spread on the paper, and to press down any part of the plant that is inclined to lie badly; the mounted sheet is laid down at one side, a few sheets of paper (newspaper or brown paper) are laid upon it, and a board (a press-board will do) is placed upon these. Another plant is then mounted in the same manner, the board removed, the mounted plant placed on the papers previously laid down, more papers put on this, and the board restored. This process is repeated until all the plants are mounted. The mounted sheets will be ready to place in the genus-covers the next day. When the mounting is completed, the weight on the pile should be increased.

The temporary labels should be kept constantly with their plants. Final labels should not be written until the plants have been mounted. To economize time these should consist as far as possible of printed blanks. In mounting, care must be taken to leave a sufficiently large space at the lower right-hand corner for the label, and if, as often happens, more than one plant requiring separate labels go on the same sheet, room for all the labels will have to be provided for prior to mounting.

The method of mounting with gummed strips, while it perhaps requires more time and work, is in many respects a pleasanter one than that with glue. In this case sheets of the same paper used for mounting, or similar paper without lines, are gummed entire on one side with mucilage. It is cheaper to make the mucilage from pure gum-arabic by simply soaking it in the proper amount of tepid water. To this, however, it is much better to add a small quantity of glycerine, which prevents, to a great extent, the tendency of the gummed sheets to roll up at the edges on drying. To gum the sheets, lay them on a flat board or other surface and fasten each corner with a pin gently driven through the paper into the board (which should be of soft wood). It will be found a great saving of trouble to have the board just a little narrower and shorter than the sheet to be gummed, so that the mucilage can be applied to the edges without danger of sticking to the board. A brush similar to the one described for the glue is used to lay on the mucilage. The latter should not be too thick, otherwise the coating will be uneven, but at least two coats will be required to give it the proper adhesive power. The second coat is put on after the first has become dry.

If several sheets are gummed at one time, which is the best way in order to consume all the mucilage made at once, they may, when dry, be kept in a large book or under some pressure to prevent them from rolling up.

To cut the strips, shears are not to be recommended, although with skill they may be used. The difficulty will be to cut them of a uniform width. It is better to cut them with a sharp knife on a broad piece of pasteboard to a straight-edge. For this latter a thin board, six or eight inches wide and considerably longer than the sheet to be cut, is much more manageable than a narrow rule. The under surface of this board should be rough and the edge smooth. The point of the knife must be kept sharp, and it should have a thin blade. An ordinary shoe-knife is better than a jackknife or penknife. An ink-eraser is a tolerable substitute. The average width of the strips should not be over $1\frac{1}{2}$ lines, but occasionally a wider one will be needed for thick stems. One sheet may be cut up at a time and when consumed another cut. The long strips thus cut may then be, most of them, cut into short pieces of from half an inch to two inches in length, the ordinary length required being about three-fourths of an inch. A few long strips should be left uncut for special cases as they arise.

In mounting with gummed strips, the specimens may be deliberately adjusted to the sheets and then fastened down. A wet sponge is needed to moisten the strips which are placed over the stems, peduncles, petioles, etc., wherever they are required to make the plants secure. They should generally be placed over the tips of pointed leaves, and may lie over some flowers without concealing their essential parts. In putting them down, care should be taken to bring the whole of the gummed surface into contact with the paper, except only as much as is occupied by the plant, which needs to be tightly encompassed and snugly held down to the sheet. This is best done by a pressure of the thumb-nails along both ends of the strip towards, and closely up to the plant.

As to the relative merits of the two modes of mounting, it may be said that perhaps for very large herbariums, which are in constant use, the method with glue is the best, since the tenderer parts of the plants are thus firmly held to the sheets, and not liable to be damaged. This method, however, is not sufficient in cases of terete stems, and needs to be supplemented by strips over such parts. The objection to the strip method is that it conceals some parts of the plants and makes the sheets look less natural. But if carefully and tastefully

done, this objection need not have great weight. On the other hand, it has this important scientific advantage, that if mistakes are made the plants may be taken off, and if very essential they may be removed uninjured, turned over, or studied. With many botanists these considerations preponderate largely, and it is probable that they come to have more and more weight as experience points out the defects of the glue system. For small or private herbariums, therefore, the strip system is, I think, upon the whole, to be preferred.

In mounting plants, by whatever method, a few precautions will be necessary. The majority of specimens are small enough to admit of putting two or more on a sheet. Unless very small, no two from the same locality should be mounted together, except where they differ in some important respect, which it is desired to show. But a sheet is vastly improved where specimens of the same plant, from widely varying localities, are grouped together upon it. In the course of a botanist's travels and exchanges, he will obtain duplicates of this kind. Some seem to have an idea that if they have a plant, no matter from what source this is sufficient; but a herbarium consisting of only one specimen of each species would be next to valueless, though it should thus embrace a large part of the flora of the country or the globe. Instead of putting everything into the duplicates of which you happen to have a representative, it should first be ascertained whether a new plant is from a different locality from that of any you already have mounted; if so, mount it at all events, and if possible on the same sheet. The first specimen mounted on a sheet ought to go on the right-hand side, so that its label will naturally occupy the lower right-hand corner. Without crowding it out too near the margin, care should be taken not to waste space by putting it too near the middle so as to prevent another specimen from being mounted on the left of it. If lacking in any of the particulars which should be represented, and can be obtained from the local flora, such as fruit or radical leaves, these should be procured and added to the sheet before specimens from other localities are given a place. The date, etc., of collecting these additional parts should be added to the label, or if they seem to require it, a new label may be written for them. Where only two specimens fill a sheet, one of the labels should occupy the right and the other the left corner; if three go on, the third label may occupy the middle of the lower edge of the sheet. In the case of very small plants, several specimens are needed properly to represent each plant. The lower half of the sheet may first be occupied and after-

wards, if additional specimens are obtained from other localities, they can occupy the upper half, with the labels under them in the middle of the sheet.

In fastening down the labels it is not best to gum the entire surface, as they will then roll up, warp, and assume a wry position which can never be cured afterwards. This can, it is true, be prevented by immediately putting that corner of the sheet into a clamp and leaving it there till dry, or by using heavy weights, but this is generally difficult or impracticable where a large number of labels are to be put down at one time. By gumming only a narrow portion of the upper margin of the label there will be no warping, and I recommend this plan. It is proper, however, to state the objection to it, which condemns it in the eyes of some. This is, that in handling the plants one is apt to take hold of the loose portion of the label and tear it off. I have never yet torn one, and do not think the objection serious, but at least it need not be, if the sheets are manipulated with the thumbs and near the middle, in the manner described a few pages back. If pains are taken in putting down the label to have its outer edges fall a trifle inside those of the sheet, there will be no danger of ever taking hold of the label.

5.—CARE OF DUPLICATES.

Some botanists pay little attention to their duplicates, arrange them in no definite order, keep them in parcels, each summer's collection by itself, or in other unsystematized ways, and depend upon memory to hunt out anything they may want to find. This is in a high degree reprehensible, and really occasions great loss of time. Others arrange them in the alphabetical order of the genera, which is much better, but is not to be recommended. It is best to arrange them carefully, according to the natural system, the same as the herbarium.

How to label the cases of so shifting a mass has been a serious difficulty. I have heard very few plans of doing this suggested, and I think nearly all botanists leave them without labels and depend upon memory to dip in wherever they think their plant is. I will give my own method, which has worked admirably, and which eminent botanists have admired and expressed an intention to adopt.

Strips of white paper, 19 inches in length, are cut of two widths, one kind 2 inches wide, the other 1 inch. The former are used for genus strips, the latter for species-strips. Every genus is furnished with one of the wider sort and its name is written across one end, which projects far

enough in front to leave the name in full view, and when the doors are closed this end bends down so as to present it clearly to the eye. If the genus contains only one or two species, or even three, species-strips are not used, but for all genera represented in the duplicates by four or more species, each species is also provided with a strip. Between the genus-strip and the first species a sheet of paper intervenes, so that the two strips will not lie upon each other. Single sheets are alone used to put duplicates on, and great facility is thus secured in handling them. The plants occupying each partition are placed between large-sized paste-boards, the upper one of which is thinner and more pliable than the lower. This latter feature will be found a great improvement upon the use of two stiff boards.

6.—EXCHANGING SPECIMENS.

The duplicates are the botanist's stock in trade. With them he must expect chiefly to enrich his herbarium. This is done through *exchanges*. His local flora is sure to contain many things that are not to be found in some other places, and every such place will possess species which he cannot find. By notifying other botanists of what he has to exchange, he will receive offers which will be mutually beneficial to both parties. Besides having his duplicates conveniently arranged, he must also prepare and keep up a strict list or other account of them. This can best be done by marking them on the check-list of his local flora, if there be one, or on some larger catalogue embracing them all. It is well to have two copies of this, so that in case one is lost in the mails, all his labor in preparing it will not be also lost.

When fully prepared to commence exchanging, he consults the Botanical Directory and drops a brief note to each of the botanists in localities from which he desires to receive plants, inviting them to exchange, some of whom are sure to respond favorably. To such he sends his list of duplicates and requests theirs in return. His correspondents select from his list such plants as they desire, return his duplicates, and send him their lists. In like manner he selects his *desiderata* from their lists and returns them. If each wants about the same number from the other, the packages are made up and forwarded and the exchange is consummated. If there is great inequality, further negotiations are required.

In making up packages to send out, each specimen should be accompanied by a nice permanent label, such as any one would be willing to have attached to it in the herbarium of another botanist. This is chiefly

in self-protection, for unless you send good labels they will not be affixed to your specimens and you will not get credit for them; or, if affixed, they will remain a permanent reproach to you and your methods of working. To avoid extra labor, it is better to have blank labels printed with everything except the name and date. If you have rare plants in quantity to distribute, it is well to have the whole label printed for such. In a few years you will find that you will have several different kinds of duplicates for which a single blank will no longer answer, and you will want two or three kinds of blanks; *e. g.*, one for your local plants, with the locality and your own name as collector printed; one for plants collected elsewhere by yourself, with your name printed but the locality left blank, and one for duplicates received from other botanists who have wrongly neglected to send labels. For these last you should give credit to the true collector in a blank space for his name, but take credit for the specimen by having the words "Ex Herb. ——— (your own name)" printed over the top of the labels used for these cases. Where flowers and fruit are collected at different dates, this should be stated on the label, and there should be a package of blank labels with two lines for dates to be employed in such cases. If all are so printed, one of the lines will in most cases be left blank, which looks incomplete, and it is best to have most of the labels with only one line for date.

The process of "getting out" duplicates for exchange will then consist in the following steps:

Your correspondent's list of *desiderata* lies before you and you look at the first name. If he is a methodical worker it will be the one nearest the beginning of the natural system and nearest the head of your duplicates. You take out the package (all the plants in that partition) and place it on the table, find the genus or species wanted, as the case may be, on your genus or species slips, and take up and lay aside all above it; you then select your specimen, copy the name, date, etc., from the temporary to the permanent label, and place the plant and label on a separate sheet of paper, where you desire to build up the exchange package. The bottom of this package, of course, consists of a piece of paste-board and the specimens are placed on papers (newspaper) of convenient size. Some botanists use for this purpose any old torn scrap of paper or small irregular bits. This is not to be recommended, as it tends to pile up the plants too much in the middle and bend and injure the specimens. This is probably done for economy in postage, but this object can be almost as effectually secured while using papers of a uniform

size by having the whole package, boards, papers, and all, considerably narrower. Few single specimens are more than 9 or $9\frac{1}{2}$ inches wide, but most packages are made 11 or 12 inches wide; this saving of two or three inches in width is very considerable, and works in all cases quite as well.

The next plant on the list of *desiderata* is then found, taken out, and labeled in the same manner, and so on until the list is exhausted. If at any time you take out the last duplicate you have, do not fail to strike it off your list of duplicates, and if you have two such lists strike it from both. The law forbids the sending of labels of which any part is written, as third-class-matter, and it is necessary to give each label a temporary number and put with the specimen a corresponding printed figure (cut out of a calendar), and to send the labels in a letter. Rather than do this I generally patronize the express companies wherever my correspondents are near one of their stations. A very sensible decision was made by Postmaster-General Key that scientific labels, bills of lading, etc., if they contained nothing irrelevant, might pass with the specimens. This ruling has since been reversed as not in harmony with the spirit of the law.* There are cases where large packages have to go short distances, when it is more economical to send them by express.

A package to be sent by mail or by express should be securely done up. The plants are first placed between two paste-boards of uniform size and tied up with a string around the middle and each end; then a piece of heavy wrapping-paper, large enough to envelop it entirely, is put around the package in a systematic manner, drawn firmly up laterally, the ends neatly turned back, and the whole securely bound with strong twine. The twine should be in one piece and go first round the middle, then round each end, then round the middle endwise, and perhaps also three times round in this manner, once near each edge of the package. Each time that the cord crosses another it should have a turn round it, and each time it completes a circuit be secured in the approved manner. These directions are important in view of the fact that the least movement of the specimens in the package works their immediate ruin.

* As much doubt and uncertainty still exists on this point, I will say for the benefit of all concerned, that I called personally at the Post-Office Department (December 6, 1881), and was officially assured of the correctness of the statements herein made. It is, however, a great inconvenience to all branches of science, and operates against the Department and in the interest of the express companies. An earnest representation of the subject on the part of the large scientific bodies of the country would doubtless secure the amendment by Congress of the act in question, and this should be done.

7.—GENERAL REMARKS ON HERBARIUM WORK.

The herbarium is a perpetual growth. Every summer specimens of your own collecting are added to it, and every winter still more are received through exchange. Nothing ever goes out, but accessions are constantly being made. It is therefore very important to keep a strict account with it. You want to know at any moment not only what you have, but how many you have. If asked how large your herbarium is, you want to be able to answer by a glance at your account—4,000, or whatever number of species it actually contains. You also want, if any one asks you whether you have such and such a plant, to be able to reply, if not from memory, which, of course, is not always possible, by a moment's looking at something besides the specimens.

Very little herbarium work can generally be done during the collecting season. It is often necessary, and perhaps best, not to attempt to distribute current collections. After the season is over the plants collected and preserved during the summer are first all arranged in botanical order; then, beginning at the first, they are placed in two general sets, which your notes and lists enable you to make, one of which contains only new, *i. e.*, unmounted plants, and the other, specimens of species already mounted. With regard to the first of these sets, of course your duty is simple; they must be mounted and go to swell the general collection. But as to the second, it will by no means do rashly to class them as duplicates and as such put them away. Every one should be carefully compared with what you have previously collected. So rapid will be your improvement in making good specimens that you will be surprised oftentimes that you should have considered the one previously put away a good one. If, then, you have had the patience to refrain from mounting the earlier ones, it will be no trouble to substitute the later and better one. But in many cases where the first specimens were good this comparison will enable you to supply missing forms and states and help to render the herbarium perfect. After all such have been thus compared and the specimens or parts needed for the herbarium have been taken out for mounting, the remainder will constitute true duplicates to be added to your list of duplicates, and put away in their proper order in that department.

Next, as regards the winter accessions. Unavoidably there will come in packages by exchange a good many plants that you already have in your herbarium. These should be compared as above described, but, as already remarked, if from other localities than any you have, they

should be mounted. It will not do, however, to mount them without comparison with those on hand, for in the majority of cases your sheet will not be full and the new plant can be added to it, which, aside from the question of economy, is far more scientific than to have them on separate sheets.

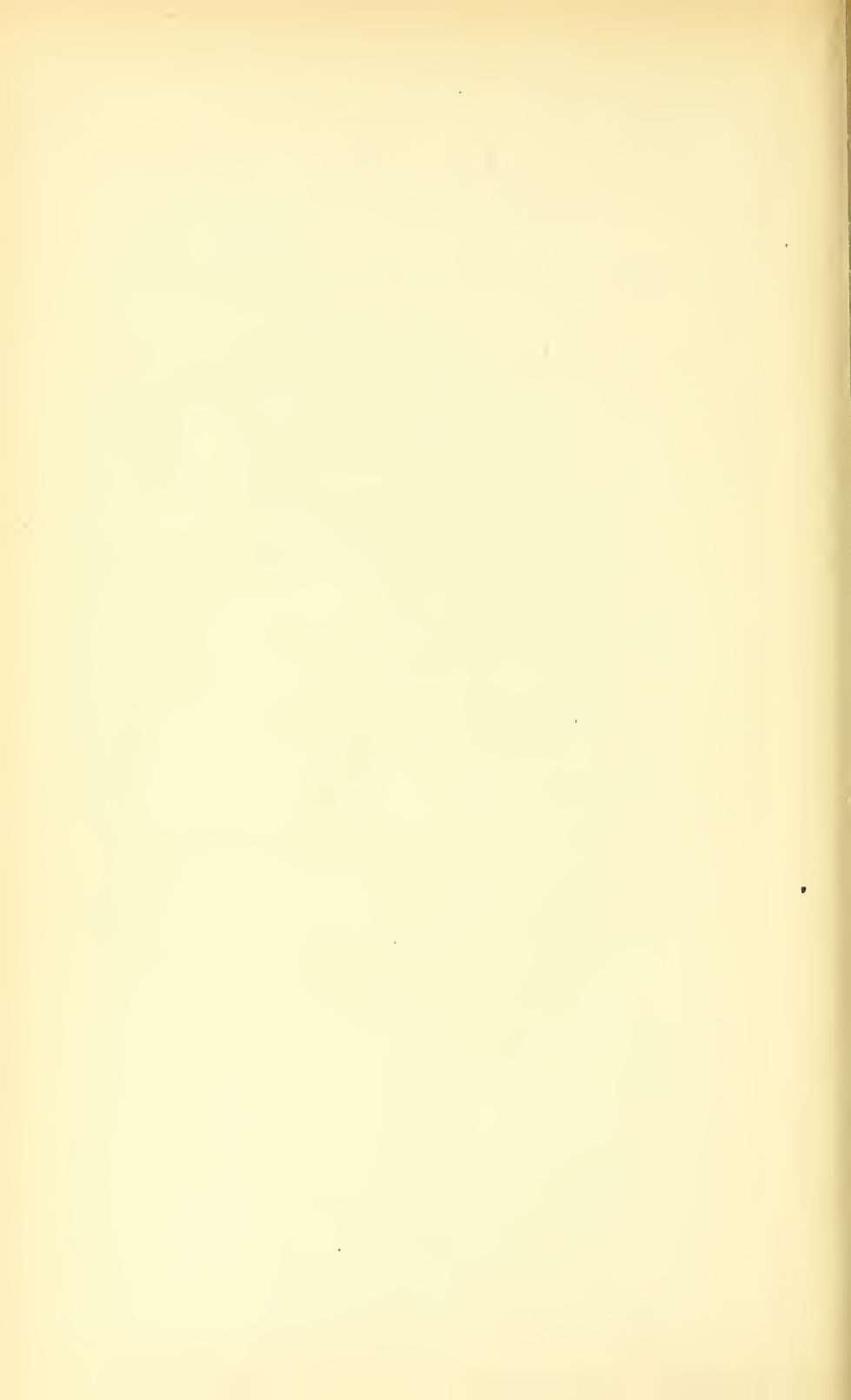
Not only with regard to summer, but to all winter accessions, the number added should be carefully noted and footed into the running account, so that the whole number in the herbarium may be at all times known. It is more difficult to have easy access to any name and be able to say with certainty whether you have it or not. Some merely mark their books and catalogues where the plants are enumerated and depend upon finding them in this way, but this is a clumsy method, not to be recommended. If there is a large comprehensive check-list, like *Mann's Catalogue*, it is well to devote one to this purpose, and so far as the plants there enumerated are concerned, this will show whether you have them or not. But you will be sure in time to get plants not found in any such check-list. Of course lists of such can be kept, and should be, but eventually they will become inconvenient. Plants will reach you of which no book in your library, and none accessible to you, contains a description. What shall be done with these? After a great amount of trouble of this kind I have found myself driven at last to the adoption of the card-catalogue system for my entire herbarium, and so charmingly does it work that I do not hesitate to commend it to the profession, and to advise beginners to commence with it and keep it up. This perhaps need scarcely be described, but I may briefly say that it consists of a drawer of cards, alphabetically arranged, on which are written the names of all the plants in the herbarium. All necessary details may be obtained by a visit to any large library and an inspection of its card system.

When a package of plants is received, or in any way comes up for final disposition, it is opened and the first specimen is examined. If already represented in the herbarium, it is put into the pile to be compared. If there be any doubt, the cards are consulted; if not found, a card is immediately written and slipped into its place in the drawer; the plant is then placed in the package to be mounted. In this way no new plant ever finds its way into the herbarium without its card having been first added to the card-catalogue.

The vast multiplicity of different objects to be handled in making a herbarium, and the variety of ways in which they require to be disposed

of, render careful work and systematic arrangement of the highest value; and in the long run the more methodical the procedure the more rapid the progress. Many of the detailed explanations above given may seem trivial and unnecessary, but they are the result of experience, acquired through unnumbered mistakes and erroneous impressions which would never have been made or entertained had there existed any systematic treatise on the art (for such I maintain that it is) of practical botany.

In conclusion, I cannot refrain from speaking a word in defense of the herbarium as an instrument of scientific culture. It is a collection of natural objects, scientifically classified and ever present for inspection. No question is so often asked the botanist by the unappreciative public as "What are you going to do with the plants?" The idea seems to be that unless you can extract some essence or elixir from them, either as a medicine, a food, or a perfume, they can be of no possible use. The most satisfactory answer I ever heard given to this query was by an amateur lady botanist, who with genuine female intuition replied, "Just what you do with your books; a herbarium is a library to be consulted, studied, and read." This is it, precisely. It is a library filled with volumes written by Nature, and which those who have learned the language of Nature can read and enjoy with a satisfaction as much keener than anything that man-made books can give as it is nearer to the source of all truth.



ADDITIONS AND CORRECTIONS.

Page 13.—16th line from top, 1st column : Dele (4) *Gerardia quercifolia* Pursh.
3d line from bottom, 2d column : Dele *Polygonatum latifolium*.

Page 32.—Add to list of autumnal flowering species:

Lepidium Virginicum (flowers and fruit), December 14, 1881.

Dianthus Armeria, October 9, 1881.

Cerastium vulgatum, November 17, 1881.

Chrysogonum Virginianum, October 9, 1881.

Linaria vulgaris, November 1, 1881.

4th line from bottom: for **seventeen**, read **twenty-two**.

Pages 34-47.—Correct all tables in Chap. IX by adding the following species:

Nasturtium obtusum.

Tanacetum vulgare.

Polygonum amphibium.

Quercus ilicifolia.

Tofieldia pubens.

Page 92.—Between **Leucanthemum**—June, and **Arnica**, insert:

Tanacetum vulgare, L. TANSY.

Nichols avenue, Uniontown, July 26, 1879.

Page 95.—After **Rhododendron maximum**—Chain Bridge, Va., insert: (Professor M. H. Doolittle).

Page 123.—After **Muscari botryoides**—Falls Church road, insert: (Professor Chickering).

Page 146.—To *Compositæ*, add one genus and one introduced herbaceous species (*Tanacetum vulgare*).

Page 147.—In RECAPITULATION: add one genus and one introduced herbaceous species (*Tanacetum vulgare*) to Gamopetalæ, Dichlamydeæ, Dicotyledones, Phanogamia, Vascular Plants, and Total Flora.



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[Species are not indexed except when specially mentioned out of their systematic place in the Catalogue. Synonyms are in *italics*.]

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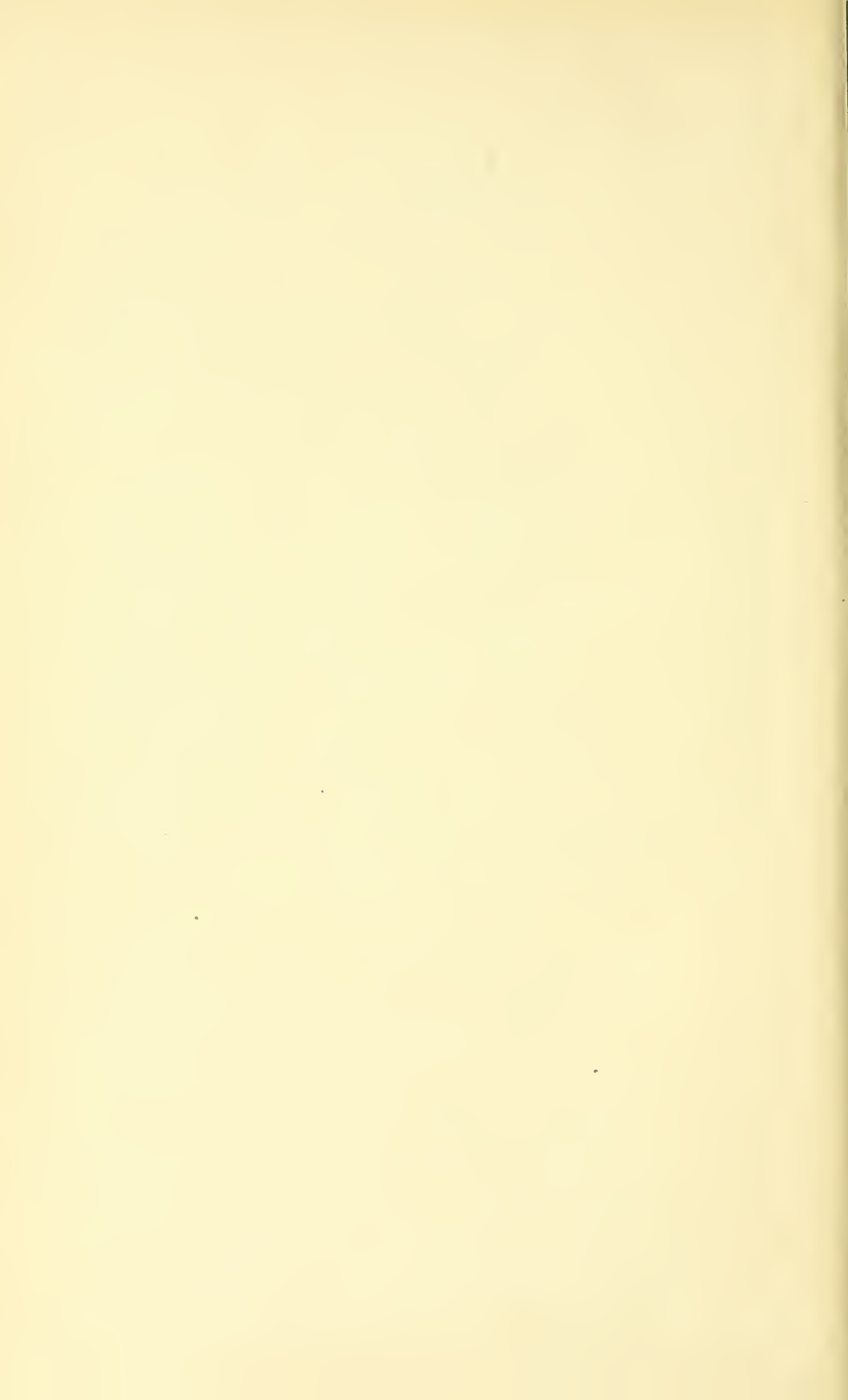
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