

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

3 2044 106 370 406

Bus
Eng
D-9



HARVARD UNIVERSITY

LIBRARY

OF THE

GRAY HERBARIUM

Received

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

The Library of Harvard College
The Botanical Society of London

VOL. I. Rec. July 29. 1839. PART I.

RECEIVED

PROCEEDINGS

OF THE

Botanical Society of London,

CONTAINING

RECORDS OF THE MEETINGS OF THE SOCIETY SINCE ITS ESTABLISHMENT, JULY 1836, TO NOVEMBER 1838; TOGETHER WITH THE SEVERAL ORIGINAL PAPERS ON LOCAL AND GENERAL BOTANY, &c.

WITH PLATES.

Printed by Order of the Council.

LIBRARY OF THE GRAY HERBARIUM
HARVARD UNIVERSITY
ENG
B-9
~~THE GIFT OF~~
transferred from
Harvard College Library

LONDON:
DARTON AND CLARK, HOLBORN HILL.
1839.

Price 6s. 6d.—To Members, if obtained of the Secretary, 5s.

Digitized by Google

27960
Bd Lon 1960

CONTENTS.

COMMUNICATIONS.

P

I. On the Influence of Light upon the common Broad Bean, with the results of an Experiment made in order to ascertain whether Coloured Fluids are taken up by the Roots of Plants, by *D. Cooper, A.L.S.*, Curator. (With a Plate.)

II. On the Importance of Local Botany, by *A. Irvine*

III. A Notice of Plants growing spontaneously on and about Warley, Essex, by *Dr. Æneas MacIntyre, F.L.S.*

IV. On the Rarer Plants of Deal, Kent, *G. E. Dennes F.L.S.*

V. On the Distribution of Plants in Battersea Fields, Surrey, by *Daniel Cooper, A.L.S.*, Curator

VI. Notes on Plants found near Bristol, by *T. Hancock*

VII. Hints on the Importance and Practicability of adopting a more Systematic Method in Describing and Arranging the Species of Plants, by *Joseph Freeman*

VIII. Notes on Lamium maculatum, by *T. Hancock*

IX. On the Flora of Chelmsford, Essex, by *A. Wallis*

X. On Victoria Regina, by *R. Schomburgk.* (With two Plates)

XI. On Loranthus Smythii, by *R. Schomburgk*

XII. On the Influence of Barometric pressure on Plants, &c. by *Mr. Woods*

XIII. On Hybridity occurring in Ferns, translated from M. Marten's Paper, by *W. H. White*

XIV. On a New Species of Epilobium by *M. Den Kalaar*

XV. Reply to M. Marten's Paper on the Hybridity of Ferns, by *J. Riley*

XVI. On the Triplaris Americana, (*Ant Tree of Guiana*) by *R. H. Schomburgk.* (With a Plate.)

XVII. On the Genus Myosotis, by *A. Wallis*

XVIII. On Bertholletia Excelsa, (with Two Plates) by *R. H. Schomburgk*

XIX. Details of the First Excursion made by the Members of the Society, 1838, by *Daniel Cooper*

XX. On a Principle of Fencing formed according to the Laws of Vegetable Physiology, by *Daniel Cooper*

XXI Translation of *Dr. Unger's* Paper, on the Formation of Crystals in the Cellules of Plants

XXII. Details of an Excursion from Woolwich Kent, to Cobham and Cuxton

XXIII. On the Advantage of Botanical Statistics, by *W. M. Chatterley*

XXIV. Extract from the President's Address, read November 29th 1838.

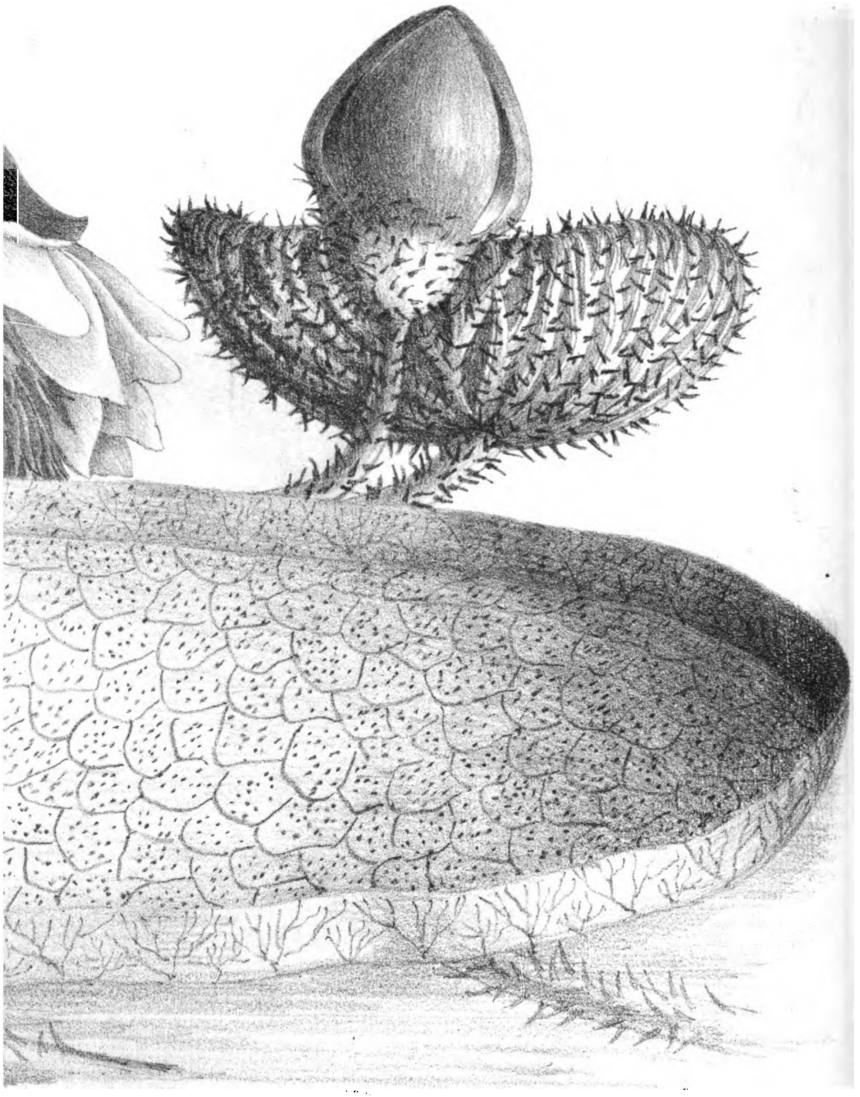
List of Members

N.B.—All Letters and Communica'ions for the Society, to be addressed to the Secretary, ~~*75, Newman Street, Oxford Street.*~~ *25 Bartlett Bu*
Holborn

Digitized by Google

Digitized by Google

4



Drawing by Miss Gray.

Digitized by Google

PROCEEDINGS

OF

THE BOTANICAL SOCIETY

OF

LONDON.

Printed by Order of the Council.

LONDON:
DARTON AND CLARK, HOLBORN HILL.
1839.

Digitized by Google



Digitized by Google

NOTICE.

THE Council of the Botanical Society of London in publishing the First Part of their Proceedings, feel called upon to state that they do not consider themselves in any degree answerable for the opinions expressed in the Papers; and, at the same time, take this opportunity of inviting Communications from Members and others relative to Physiological and Systematic Botany, and particularly Botanical Geography.

"The Council moreover trust that each individual Member will subscribe for a copy, and will likewise use his endeavours with his friends to do as much as possible in helping to defray in this way the expenses attendant on them: owing to the low Annual Subscription, and the several advantages the Members receive for it, it has not been found practicable to present them gratuitously to the Members." *(Extract from President's Address, Nov. 29th 1838.)*

BOTANICAL SOCIETY,
75, Newman Street, Oxford Street,
February 20th 1839.

Digitized by Google

Digitized by Google

PROCEEDINGS

OF THE

BOTANICAL SOCIETY OF LONDON.

At a Meeting of the Practical Botanists in London, convened by Mr. Daniel Cooper, on the 27th July 1836, at the Crown and Anchor Tavern Strand, for the purpose of taking into consideration the propriety of establishing a Botanical Society in the Metropolis,

Mr. White having been unanimously called to the chair, it was proposed by Mr. Daniel Cooper, and seconded by Mr. W. M. Chatterley, that a Society be formed for the exclusive cultivation of Botanical Science,—to be called the Practical Botanists' Society of London, which name was afterwards altered by the Provisional Committee appointed on that evening, to the Botanical Society of London. In accordance with the views entertained by the Provisional Committee, the following notice was issued to the several Botanists in London:

"By the advice and sanction of some eminent Botanists, it is proposed to form a Society, under the above name; the objects of which are, the advancement of Botanical Science in general, but more especially, Descriptive and Systematic Botany, by the reading of original and other Papers on the habitats, particular characters, &c. of Plants; by the formation of a Library, Museum and Herbarium, for reference and exchange of specimens.

"Several Gentlemen, friendly to such a Society, have held some preparatory Meetings, and drawn up regulations for its government, which will be submitted to a General Meeting, *at the Crown and Anchor Tavern, in the Strand,*

Digitized by Google

on Wednesday Evening, 12th October, at Eight o'Clock precisely, when the nature and objects of the Society will be more fully explained.

"The attendance of those who may be willing to promote the Science in any way, is respectfully invited. It is proposed that Ladies be admitted Members, with a full participation in the advantages of the Library, &c.

20th, Sep. 1836. W. M. CHATTERLEY,
Hon. Sec. pro tem."

The two following Meetings were occupied in appointing Committees, preparing the laws requisite for governing the Society, and making the necessary preliminary arrangements.

The following Prospectus was then agreed to by the Committee, and issued to the different Botanists in London and its vicinity:

"Societies for the cultivation of Natural History generally, for the cultivation of Horticultural Botany particularly, for the cultivation also of Medical Botany, are already in existence in this metropolis, but no Society especially devoted to general Botanical Science has hitherto been instituted. The advantages of a Society of the last-mentioned description, will probably be admitted by every one who has the slightest acquaintance with Botany, and will, without doubt, be acceptable to all who are desirous of obtaining information on the various subjects which will necessarily come under the consideration of such a Society.

"A number of gentlemen, having seriously considered the many desirable results which such a Society cannot fail to produce, and having fully decided upon the necessity, have instituted, 'THE BOTANICAL SOCIETY OF LONDON,' for the promotion of the following objects, viz.:

"I. To concentrate the labours of individual Botanists, by holding stated Meetings in some central situation, with as little expense as possible to the Members, where each may communicate his information, and receive that of others in return.

"II. To read Original Papers, and Translations of Foreign Memoirs of importance, on Botanical subjects, at the Ordinary Meetings of the Society.

"III. To examine and describe all plants, that have not

Digitized by Google

hitherto been accurately described, and to communicate the results at the Ordinary Meetings of the Society; and by a separate examination of the same plants, by different persons, produce a series of accurate descriptions of genera and species, which could not possibly have been done without such a co-operation of scientific Botanists.

"IV. To publish these descriptions and other transactions, as often as may be deemed expedient.

"V. To form HERBARIA of British and Foreign plants, for the reference of the Members, and exchange with other Societies or individual collectors, and thus be the means of producing many valuable Herbaria, which otherwise would not have been completed or even commenced.

"VI. To form a Library and Museum.

"This Society consists of Resident, Corresponding, Foreign, Life, and Honorary Members."

NOVEMBER 3RD.

J. E. GRAY, ESQ., F.R.S., in the Chair.

Mr. Daniel Cooper communicated a Paper, being the result of some observations "*On the influence of light upon the common broad-bean, with the results of an experiment made in order to ascertain whether coloured fluids are taken up by the roots of plants.*" Mr. Cooper thus commences:—

NOT having heard of any experiments that had been made on the watering of plants with coloured fluids, and entertaining in my own mind some opinion respecting the separation of fluids by the spongioles of the roots, I made the above plant the subject of experiment. Reasoning from analogy it appeared to me that if spongioles had the power of absorbing silica, lime, sulphur, magnesia, &c., as is stated by Schrader, by watering plants reared in a place which was totally excluded from the action of light (and thereby rendering them blanched) with solutions of colouring matter, if the coloured fluid should be imbibed by the spongioles, the plant possibly might exhibit a singular appearance, I procured a

Digitized by Google

plant possessing a large quantity of cellular tissue, and, with these views, commenced the following experiments: —

Having procured three garden pots, I placed three common broad beans in each of them, on the 17th of February, 1835, the earth contained in two of them being composed of ordinary garden mould, finely sifted, while the remaining one was filled with common house-sand, perfectly dry, which was selected for the purpose of observing whether coloured fluids were imbibed by the roots of plants. This pot, with one of the others filled with garden mould, was placed in a cellar were light had not access; while the remaining one was placed in an apartment where daylight could easily enter. They were all watered with an equal quantity of fluid, but the one containing the sand in the dark apartment was moistened with common water, holding in solution a large quantity of *madder*: it was a dark coloured and strong infusion. I thought it better to use a vegetable colouring matter, for this reason: that metallic solutions act upon plants somewhat as they do upon animals: and, moreover, it would have been necessary to produce a considerable degree of colour, which would require a very strong solution of any metallic substance: and the stronger the solution, the more deleterious the action would have been on the vegetable tissue. Suffice it to say, that the plant watered with the infusion of madder did not exhibit a different appearance from the other plant placed by its side, which was supplied with common water. Had any sickly appearance been produced by the madder, it would instantly have been perceived by comparing the two specimens which were placed under circumstances otherwise as nearly analogous as possible. The beans being put at the same distance from the surface of the mould in all the pots, I was rather curious to know which would show its plumule first, the one placed in the dark, or the other exposed to the action of daylight; the one grown in the daylight was the first to show its plumule by three days. The plumules of those sown in the light were of a green colour, while those in the dark were of a straw or light yellow colour. The growth of the stem of those plants which vegetated in the dark, exhibited the following peculiarities: It was developed at a much greater rate than those in the daylight in the proportion of three inches to one, but was much softer, and the cells were considerably larger; but I could not discover the slightest traces of the colouring matter in the stems of those watered with

Digitized by Google

madder, even with a powerful Microscope. Another peculiarity was, that the nodi were fewer, and no development approaching to a perfect leaf could be observed; rudimentary leaves were to be seen, and even more developed than those in the accompanying figure (Pl. 1. Fig. 1.) of a light yellow colour. Beneath these nodi were observed light purple or slate coloured spots. In the specimens reared in the daylight, more than eight leaf-buds could be distinguished, while those excluded from the light developed one leaf-bud at a distance of eight or nine inches from the cotyledon; and, at the summit of the stem, a number were crowded together in the same rudimentary state. The cotyledons of the specimen reared in the dark, remained nearly, if not quite the same distance, below the surface of the mould, as when originally placed there; while in the other specimens they rose to the surface. On comparing the two specimens, it was noticed that about two inches above the cotyledons of the specimen produced in the dark had evidently been buried in the earth, for fibres were observed issuing from the lower part of the stem; (see Pl. 1. Fig. 2.) while in the opposite one, the stem proceeds directly from the cotyledons, and no fibres were observed above the collum or neck, a circumstance worthy of remark; proving that the cotyledon remained stationary, and was not uplifted to the surface of the earth, as happened in the specimens grown under ordinary circumstances. (Pl. 1. Fig. 3.)

Having satisfied myself of the great difference of growth exhibited by this plant, under the circumstances which have been related, I reversed the order of things; brought the specimen from the dark into daylight, and vice versâ, when neither flourished for any considerable space of time. The specimens placed in the light, the day after their removal, became flaccid; the next day they could not support their own weight, and bent double, the tips of the imperfectly formed leaves began to be tinted of a green colour. The following day, dark brown or chocolate coloured marks appeared under the leaf-buds; and in four and twenty hours from that time, the leaves were dying off, and the stem was soon entirely withered. A similar effect was also observed in the specimen reared in the daylight, when placed in the dark apartment. From the time of its introduction, a gradual withering took place; and at the end of five days, it did not exhibit the slightest appearance of vitality.

Mr. Wilkinson informed me of a curious fact connected

Digitized by Google

with this subject, with regard to a potatoe, which had by chance fallen into a well of 12 feet or more deep. He stated that he was one day surprised at seeing a white stem-like body creeping out of a hole, in some boards that were placed over the well; anxious to observe its progress, he allowed it to pursue its course, which would obviously tend towards the strongest light, the stem soon became of a green hue, and leaves appeared on the axis; the plant, he says, showed every sign of flowering. Wishing to see from whence this specimen came, he removed the covering of the well, and cautiously drawing up the slender white leafless stem from the bottom, (12 feet) succeeded in obtaining the potatoe. This is a very interesting fact, for it shows to what extent plants will elongate in order to seek for light.

From this it appears that plants will flourish after their axes have been developed to a considerable length, provided they *gradually* become exposed to the rays of the sun; but when they are *suddenly* removed from *darkness* into *light* they wither and perish in a short time.

Explanation of Plate I.

Fig. 1.—*Represents a portion of the stem grown in the dark, showing the slight development of the rudimentary leaves.*

Fig. 2.—*Exhibits the lower part of Fig.* 1, *showing the fibres issuing from the stem above the cotyledon, together with the cotyledon and root.*

Fig. 3.—*The lower part of the stem grown under ordinary circumstances as contrasted with Fig.* 2.

NOVEMBER 17th.

J. E. Gray, Esq., F.R.S., in the Chair.

Mr. A. Irvine communicated the following Paper, "*On the importance of Local Botany:*"—

The object of this Memoir is, to offer certain facts respecting Local Botany, and to draw from thence a few inferences, from all of which you may be able to judge of its importance, in relation to the general subject.

Digitized by Google

Of the multitude of species growing in all parts of the earth, and forming what is commonly termed the vegetable kingdom, only a very small number in proportion to the whole, can be collected in any particular district or country. But the amount of species in any one county, or National Flora, constitutes a great proportion of other Floras, whether provincial or territorial, especially of such as are in contiguous regions. The number of vascular species, spontaneously growing within twenty-five or thirty miles of London, equal in amount two-thirds of British plants of the same kind. They are more than double of the number in the Flora Lapponnica. They exceed the number in Sweden; form one-half of the German Flora; rather above one-third of the Austrian Flora; and about one-fourth of the French Flora.

As all these countries, with the exception of part of Sweden, the whole of Lapland, and the South of France, lie in the same parallels of Latitude, the species found in any one of them will generally constitute part of the species of the others. For example, most of the Lapland plants are natives of Sweden. The greater part of the Swedish plants will be found in Germany. The German plants again constitute a large portion of the Floras of Austria and France. Nearly all our British plants grow in these continental kingdoms, with considerable additions of species, genera, and even families. Our insular situation has formed a barrier to the migration of many European species and genera, although our climate be suitable for their preservation and propagation.

If we compare our Flora with Intra-Tropical Floras, we shall perceive an immense decrease in the number of common species. A section of the Peninsula of Hindustan, extending from Lat. 9° to 19° north, according to Wight and Arnott produces two thousand eight hundred Phænogamous species, of which not above thirty are natives of this country. In the Western Hemisphere, the Tropical Flora of America, by Humboldt and Bonpland, comprises six thousand species of which not one Dicotyledonous plant is found even in Europe, and only a very few of the Monocotyledonous species. Receding from the Equator in both Hemispheres, the proportion increases. The North American Flora contains four hundred European species, and the Flora of New Holland or New South Wales one hundred. These facts prove that

Digitized by Google

species disperse farther in an easterly or westerly direction than towards the Equator.

Now if we compare the genera of the above mentioned Floras or countries, we shall find that they (viz. genera) have a wider range than species: that is, are more extensively dispersed over the earth; that in remote regions there are many more common genera than common species, and in contiguous countries that the genera bear to each other a much higher proportion than the species. The number of British genera of vascular plants is four hundred and sixty; of these four hundred, or five-sixths of the whole are the produce of the country round London, limited as above. And taking the London species at one thousand, and the British at one thousand five hundred, we find that the species increase as 2 : 3, and the genera as 5 : 6 only.

The Austrian Flora of Host, which may be taken as a mean proportional, both in number of species and range of temperature, between the German and French Floras, comprises about three thousand three hundred species, and seven hundred genera; amongst which almost every British genus and species will be found. Hence we perceive that the British and Austrian species are to each other as 15 : 33, and the genera as 23 : 35 ; or fewer than one half of the British species are found in Austria. But about two-thirds of the genera. The number of genera common to Britain and India, according to the Indian Flora above mentioned, is about one hundred and twenty, although the common species hardly amount to thirty. The proportion of genera to species being as 4 : 1.

From these statements, the following consequences may be legitimately deduced, viz.: that a person well acquainted with British plants, or even with those found in the London district, will readily recognize almost all the plants of Lapland and Sweden, above one-half of the German species, one-third of the Austrian, and one-fourth of the French. And as genera are more extensively dispersed than species, the London Botanist, by knowing the plants of his own district, can refer to their proper genera one thousand three hundred British species, about two thousand five hundred Austrian, and three thousand French species.

From similar data it can be shown that about two thousand species of the Equinoctial plants of America are referable to their proper genera by British Botanists, and also that the generic characters of three thousand Hindustani

Digitized by Google

plants may be known from the knowledge of the London genera. Also that six thousand plants of the whole number on the earth, may be safely ascribed to their proper genera, supposing the whole number of vascular species to be sixty thousand; and this can be done by any Botanist who is well acquainted with the genera that grow within a moderate walk of his own residence. Even the Flora of a moderately extensive parish will generally embrace one-half of the species and two-third of the genera to be found in the kingdom.

As genera have been shown to occupy a much larger extent than species, or are more extensively dispersed over the earth, in like manner orders are more widely diffused than genera.

For example, all the orders of British plants are found in the vicinity of London, limited as before, except twelve; and these twelve orders barely comprehend eighteen British species. Consequently the ordinal characters of all British vascular plants may be learned from such as are found within a moderate walk of this city. Also the ordinal characters of all the Northern European species, and most of the Austrian and French may be acquired from the British orders. Four thousand of the Equinoctial plants of America may be referred to their families, in the same manner, and above thirty thousand species of known and described individuals. These facts prove that the study of a district Flora is of no mean importance, when we consider that by its aid we are enabled to decide on the genera of six times the number of species the said district supplies; and on the orders of thirty times the amount of its productions. And while the student is learning the characters and uses of the plants, in his own neighbourhood, he is acquiring the same knowledge of all such as agree in genera and ordinal characters, amounting to many thousands.

The utility of Local Botanical investigation may also be estimated by its relation to national and general Floras, which could scarcely be produced without the assistance of resident Botanists or district Floras.

If we take a retrospective view of the progress of this science since its revival or rather its commencement among us, in the times of Queen Elizabeth, we shall perceive that the value of Botanical localities was known at that early period.

Gerarde, the author of the English Herbal, usually re-

Digitized by Google

cords in his great work the places where he gathered the English plants, which he has described therein. Johnson, the editor of a well known edition of the Herbal, published, about 1632, a catalogue of plants growing on Hampstead Heath, entitled "Enumeratio Plantarun in Ericeto Hampstedeani locisque vicinis crescentium." This list contains somewhat fewer than one hundred species. But as the author in his Preface professes to give such as he had not collected during his Iter Cantianum, and other Botanical peregrinations, &c., three times as many more should probably be added; and the Flora of Hampstead may, in those days, have been estimated at four hundred. Reckoning the Phanerogamous species, in the first edition of Ray's Synopsis, at nine hundred, the Hampstead plants are to those as 4 : 9, being nearly one-half of the known English species. Blackstone's "Fasciculus Plantarum Circa Harefield Nascentium," published in 1737, about one hundred years after the date of Johnson's Botanical publications, comprehends between five hundred and fifty and six hundred plants of the vascular species, collected within a circumference of twenty miles; forming more than one-half of the British plants of the same sort known at that period.

If Ray's Catalogue "Plantarum circa Cantabrigiam Nascentium," published in 1660, be compared with the first edition of his catalogue of English plants, published in 1670, we shall scarcely find one in four which is not noticed in the former work. From these facts we see how important local Floras are, as being the chief materials from which National Floras are compiled. The County Floras of Relhan, Sibthorpe and Abbott, with the more local lists of plants formed by Warner, Jacob, and Forster, subsequently enabled the author of the Flora Britannica, and of the English Flora, to supply his country with one of the most valuable Floras in existence.

Moreover, it is from local observers, who only have the opportunity of making a consecutive course of observations on plants, that we shall be able to approximate to the periods of their flowering, their times of arriving at maturity, and their seasons of decay and dissolution. By such a calendar as might be compiled from the budding, leafing, and æstivation of common species, the agriculturist will more surely learn the proper time, for his important operations, than from Moore's Almanack.

The difference in the commencement of Seasons, and their

Digitized by Google

duration in different latitudes may also be ascertained from the same source, with many other particulars respecting the geographical distribution of species, their abundance or their scarcity in different localities, their various appearances in different altitudes in open or in shady places, their preference for some soils, or their total indifference to this change. These, and many other interesting particulars, can only be communicated by resident Botanists.

One of the desiderata which could easily be supplied by the Botanical Society of London, is a Flora of its environs. During a residence of several years in the Metropolitan Counties of Surrey, Kent, Middlesex, and Essex, the author of this communication was engaged in collecting for this purpose, and he is satisfied that the amount of vascular plants growing within twenty-five or thirty miles of London is underrated at one thousand; and as there are no Alpine plants in this tract, and only a few maritime species, this may justly be considered the richest district in the kingdom, (for we have no local Flora containing an equal number) and it will repay the most accurate and extensive investigation.

The number of Phanerogamous species detected, classified, and described by myself as growing on Hampstead Heath, and in the woods and fields adjoining, within less than two miles, was some years ago six hundred and seventy. And as it is probable that a few species were overlooked, seven hundred may be expected in that quarter. I have more recently been employed on the Croydon plants, and have already entered about nine hundred species growing within twelve miles of the town; and this list, I am assured, is far from complete; if we add to these the plants growing on the banks of the river Thames, from Windsor Forest to the Isle of Sheppy, with the growth of the chalk hills about Maidstone and Rochester, the Chiltern Hundreds, the Essex Marshes, Epping Forest, Leith Hill, and the Hog's Back between Dorking and Guildford, we need not be afraid of exaggeration in stating them at upwards of one thousand. From the proportion which the number of species in certain families bear to the whole vascular Flora, the plants may, in any particular district or country, be estimated—For example, in the average of six Floras, viz.: the Edinburgh, the Devon, the Berwick, the Hampstead, the Scotch, and English Floras, the number of grasses is to the whole number of Phænogamous plants, described in these Floras, as one-eleventh and a half; or there are eleven and a half times

Digitized by Google

as many vascular plants as grasses in these districts, or rather in an average of all the districts together. Also the Compositæ bear nearly the same relative proportion to the rest, as the grasses do, or rather greater. In the above mentioned Floras they are as one-eleventh, or a little more. Now the Compositæ seen by me growing in the vicinity of London, together with a few seen by other judicious collectors, amount to ninety; which, at the proportion of one to eleven, would give nine hundred and ninety species; and allowing for the excess of the other species, above eleven times the Compositæ, about one thousand would be the result. Perhaps all that order has not as yet been observed. Several of the London species, in my Catalogues, are such as have rarely been seen in these parts, some of them were never before noticed as London plants, and a few are new to the Flora of this country. Were each gentleman, connected with this Society, to contribute his information on the subject in question, there is no doubt that the London Flora would far exceed in number of species, accuracy, and abundance of localities, every Local Flora of the country. By contributing to such a work, the members of the London Botanical Society would both furnish the student with a most desirable hand-book, and also record their own knowledge of the science. In order to accomplish this undertaking with the utmost minuteness and dispatch, printed lists of species should be circulated among the Botanists of the metropolitan districts, or elsewhere. Such lists having columns for the insertion of the precise habitation of the species, the nature of the soil where it grows, the altitude of its locality, the time of flowering, and such like.

The work might be so arranged, that in addition to the Botanical description of the genera and species found growing within this limited tract, the remaining British genera and species might be added, with short notes of their specific differences. By this means the work would answer all the practical uses of a British Flora, with the greater facility of reference afforded by a district Flora. By curtailing the descriptions, and using a small type, all the genera and species of the Continental Floras, not belonging to this country, but in the same latitude, might be inserted, along with as many of the exotic orders and genera as are without representatives in this country; at least such as are commonly cultivated in our gardens and greenhouses or used for medicinal preparations. A Flora constructed on these, or similar prin-

Digitized by Google

ciples, would be one of the most complete Botanical works ever published in this, or in any other country; and would obviate the objection sometimes made, that such Floras as districts can supply, necessarily separate groups of plants which ought to be connected, and consequently mar the fair proportion and beauty of their systematic arrangement. Several plants, properly exotics, have escaped from gardens and other places, and having found a soil and locality congenial to them, have become naturalized. These very properly are rejected in works intended to embrace British species only, and in consequence occasion much trouble to the student. Among these may be reckoned, Cannabis sativa, Solanum Lycopersicum, Geranium striatum, Malva Crispa, and perhaps many others, whose claims to a place in the British Flora are equal to those of Ænothera biennis, Datura Stramonium, and Echium Italicum. Such acclimatized plants, though unfitted by their foreign origin, from ranking with British species, might have a space allotted them in a work illustrative of British productions.

By such an arrangement the advantage of easy reference would be secured, together with other signal improvements of great importance, to those students who wish to extend their researches beyond the narrow limits of their own national Flora.

I hope it will not be deemed intrusive to propose another matter to this Society, as a very desirable object, though more connected with the general subject than with any individual branch, as Local Botany. It appears that while physiological, systematic, and descriptive Botany, have been studied and illustrated with a zeal and success unexampled in former times, chemical Botany has not been so successfully prosecuted.

Perhaps in the present state of chemical knowledge, it would be impossible to investigate the component parts of vegetable bodies, with the same successful and brilliant results, as were obtained by submitting the alkalies and alkaline, and other earths, to the test of experiment. However, it might be worth the operator's while to make an attempt.

It is certain that the chemical properties of vegetable substances are not so well understood as the same properties of inanimate bodies.

It is a common doctrine of Botany that individual species of the same natural order, contain nearly the same simple

Digitized by Google

substances, or properties, capable of producing the same effects. Therefore, it would be very desirable to know in what proportions the medical principle of Digitalis or of any other officinal plant, is diffused through all the individuals of the natural family Scrophularaceæ; and also to what extent the wonderful property of Atropa Belladonna exists in other species of the order Solanaceæ, and such like.

Although it is probable that we shall not be able to learn the uses of each and all of the plants in the economy of creation, any more than we can account for the reason of so many other existences; yet, so far as their uses and ends can be detected, it is desirable that they should be so; whereby the query *cui bono*, so often reproachfully flung at the naturalist, may be answered to the satisfaction of the querist, and the subject proved to be of direct and practical consequence to all classes of society.

Botanists might justly be said to waste their lives in frivolous pursuits, if the sole object of their labours were to learn the names of plants, and arrange them systematically. But when we consider that man, and terrestrial animals, derive their sole support and nourishment from vegetation, it cannot be said that the subject is not of great importance.

It was said that "the man who makes one single blade of grass to grow, in addition to those already growing, is a benefactor to his country." How much greater will be his claims on the gratitude of his age, and of posterity, who discovers and publishes the useful properties of thousands of plants, hitherto neglected, because unknown. The French, when deprived of their sugar-bearing possessions, in the East and West Indies, and unable to get a supply elsewhere, availed themselves of beet-root for this purpose; and what was at that time the result of compulsion, has long from choice been a staple manufacture of that country. All species of the gramineous tribe, contain, some more, some less of a saccharine juice. The stem of Zea-mays or Indian corn, appears to contain this, very abundantly, whether in a greater degree than beet-root might be worth investigating.

It is probable that the medicinal qualities of thousands of plants are unknown, or are not sufficiently known to be available in Medical practice.

It may be said that there is no necessity to learn the medicinal qualities of plants, as the practitioner can obtain from the proper source, a cheaper and better supply than

Digitized by Google

could be procured by any individual; and this is true in England, and especially in London. But may not the medical man be employed in other countries, where such a supply cannot always be had, and where several of the plants from which his drugs are obtained do not grow. In such circumstances it will surely be requisite to know from what similar productions the proper remedies may be procured.

I have now laid before you some of the benefits derivable from a knowledge of local Botany, and which I shall briefly recapitulate.

1st. That with the aid of our native plants, few indeed compared with the many thousands that beautify the earth and afford food to man and beast, a very correct knowledge of Botanical science may be acquired, and an extensive acquaintance formed with the habits, characters, and properties of at least half the species in existence.

2nd. That it is chiefly by the aid of local Botany, that national and other Floras can be accurately compiled.

3rd. I have shewn what would be the results of an accurate and extensive botanical investigation of the Environs of London.

NOVEMBER 29TH.

J. E. GRAY, ESQ., F.R.S., in the Chair.

General Meeting.

THIS being the day fixed upon at a former meeting for the Anniversary of the Society (being the Anniversary of the birth of the English Botanist, JOHN RAY), it was proposed, seconded, and carried unanimously, that the Society take its foundation on this day. The Secretary read a draft of the laws, which were submitted to the Meeting, and confirmed, after which the ballot for the election of Officers took place, when the following gentlemen were duly elected.

John Edward Gray, Esq., F.R.S., *President.*

J. Reynolds, Esq., *Treasurer.* | Daniel Cooper, Esq. *Curator.*

W. M. Chatterley, Esq., *Secretary.*

Digitized by Google

Other members of the Council—

Edward Charlesworth, Esq. F.G.S.	D.C.Macreight, M.D., F.L.S.
George E. Dennes, Esq.	Henry A. Meeson, Esq.
Joseph Freeman, Esq.	James Mitchell, LL.D., F.G.S.
Æneas Mac Intyre, LL.D., F.L.S.	T. B. Salter, M.D.
Charles Johnson, Esq.	C. E. Sowerby, Esq. A.L.S.
	W. H. White, Esq.

The President then appointed the two following gentlemen as Vice Presidents.

D. C. Macreight, M.D., F.L.S. | Charles Johnson, Esq.

After which the Chairman addressed the meeting, congratulating them upon the generally flourishing condition of Botanical Science especially in this country, and enumerated the advantages to be derived from a general study of Botany, and those likely to proceed from the establishment of this Society.

DECEMBER 1st.

J. E. Gray, Esq. F.R.S., President in the Chair.

A Paper was read by Dr. Æneas Mac Intyre, F.L.S, entitled *"A Notice of Plants growing spontaneously on and about Warley Common, in Essex."*

The investigation is restricted to a radius of less than two miles from the south eastern angle of the Common. But this area exhibits a great diversity of soil, and a consequent variety of vegetation.

The Common itself is an elevated and gravelly plain, with two or three ponds on its surface, and a branching bog near its northern edge. These ponds and boggy hollows, as well as the shady lanes and watery ditches, towards Brook Street and Brentwood, teem with interesting botanical specimens. The three diversities which have just been mentioned, namely, the dry part of the Common, the watery parts thereof, and the adjoining lanes, nourishing many plants peculiar to themselves, might be designated respectively, and

Digitized by Google

for the sake of brevity, by the letters *a*, *b*, *c*. The subsoil in all is sandy or gravelly; the ponds and the bog containing more or less of decayed vegetable matter, and many of the lanes immixing the gravel with clay or covering it with a rich mould.

The dry gravelly fields, moreover, which bound the common on the east, as well as the clayey or loamy lands, and the soft and often watery meadows lying further towards the east and the south, are particularly interesting to the agricultural Botanist. The letters *d* and *e* might distinguish the herbage peculiar to sand or gravel, from that which delights in a stiff or moist clayey soil.

The woods and groves, however, which surround the Common on every side, except the northern, are perhaps the most interesting parts of this vicinity; the trees and shrubs shading the more feeble plants, partly on a dry surface, whether gravelly or clayey, partly amidst swampy bogs. These diversities might be marked by the letters *f* and *g*. But the wood that lies on the eastern side, contains the greatest and the most interesting variety of native productions.

The number of *Genera* of which I have seen specimens in the several stations described above, exceeds three hundred and forty, including ten *Genera* of ferns. Now, all the British Genera of the same kind, that is, of Phænogamous plants and ferns, do not exceed four hundred and eighty. We have species, therefore, of nearly two thirds of this latter number, and on a superficies of less than two miles from its centre. The remaining genera belong, for the most part, to the sea-side, to chalky ground, or to high mountains. A few of the chalk-plants, indeed, are found in this locality, because a few spots are naturally somewhat marly, and the fields are often furnished with chalk or with lime, from Grays and Sifford, or from Purfleet.

A deficiency will be observed in the number of Species, as compared with the number of Genera. This arises, in part, from the entire omission of the multitudinous species of Carex and of Salix, in part, from my having neglected to register a good many species that I had cursorily noticed, and in part, I fully believe, from a real deficiency of about one hundred species belonging to the genera comprised in this list. (A list of the genera and species here followed, of which the following is the summary:—)

Digitized by Google

1. Filices	Genera	10	Species	23
2. Monocotyledons	Grasses	31	———	70
	Liliaceæ, &c.	34	———	66
		65		136
3. Dicotyledons		265	———	542
	Total	340	Genera	701 Species

In the above table the species of *Salix* and *Carex*, are not estimated.

Here, the proportion of Monocotyledons to Dicotyledons is about one to four; the genera and species in each division retaining very nearly an equal proportion to each other, viz. as one to two.

I purpose, in my subsequent communication, to give a succint *general* view of each of the three divisions already mentioned; noticing the abundance or scarcity, the luxuriance or the deficiencies of the more interesting groups, with such other observations as the diversity of the subject may suggest, as there is a very great variety of country included in this limit.

General Observations.

I. Ferns.

Neither on the common itself, nor about the watery spots by which it is sparingly studded, is there any considerable variety of ferns. The brakes, however, are in immense abundance on the former; and Blechnum boreale, with its elegant fronds, borders several of the watery places. But the neighbouring lanes and hedges exhibit these curious plants in great variety and in much profusion. Passing by Polypodium, Scolopendvium, and several of the more common species of Aspidium—we find in great abundance the

Aspidium Filix fœmina,
——— dilatatum,
——— angulare,
——— lobatum:
Asplenium Trichomanes, sparingly,
———Adiantum nigrum, plentifully.

The boggy wood, however, that is still permitted to flourish

Digitized by Google

on the western side of the common, from which it is separated only by a few sandy fields, feeds and shelters the most interesting fern in these parts, and amidst a luxuriant profusion of the ferns already mentioned, as well as of Equisetum sylvestre and fluviatile, whose elegant fronds, "mimick dwarf Pine trees." The fern to which I am alluding is Osmunda regalis, whose large and beautiful fronds—the nearest British approach to the palms of the south—rise in thousands in the interior of this otherwise uninteresting wood.

I have not noticed that these ferns are much used in the neighbourhood for economical purposes. But it is well known, that most of them possess other useful properties besides that of preparing the soil for more perfect plants, a property which is common to them with the mosses and many other Cryptogamous groups. Several more northerly districts, however, exhibit these properties, and in many cases, not without an adequate reward.

II. Monocotyledonous (or *Endogenous*) Plants.

In this division, the grasses are the most numerous, as well as the more useful species; and form, in all temperate climates particularly, the principal clothing of cultivated districts.

The common, with its bogs and neighbouring woods, as well as the sandy and loamy fields which surround it, furnish a vast variety of British grasses. Indeed, there are not many indigenous species, fond of similar localities, that may not be detected here.

In the meadows, the more favoured sorts are, Lolium perenne, Cynosurus cristatus, Dactylis glomerata, when kept well down by sheep, with some species of Agrostis, Poa, Festuca, and Bromus. Holcus mollis, and Alopecurus pratensis, although very common, are not much prized. And Hordeum pratense indicates a cold clayey soil, not easily fertilised.

In corn fields, the most troublesome grasses are Lolium temulentum, Alopecurus agrestis or black grass, and Triticum repens, or twitch, sometimes called couch grass. Clayey soils are particularly obnoxious to these weeds, from which no ordinary pains will free them.

The Orchideæ, in vast abundance, and in great variety of

Digitized by Google

colours, cover the meadows in May; and Neottia spiralis is, in several of them, equally plentiful in September. Listera ovata is in great profusion, and Epipactis latifolia very sparingly found in the woods.

Of the other plants that belong to this division, Convallaria majalis, Scilla nutans, and Allium ursinum, occupy extensive plots, and almost exclusively; whilst Fritillaria Meléagris and Ornithogalum umbellatum are found only occasionally in shady groves or copses.

I have not mentioned the multitudinous specimens of Carex, Scirpus, and Eleocharis, of Callitriche, Alisma, and Sparganium, or of Typha, Juncus, and Luciola, which we meet at every step. But the Cotton grass which grows in the bog on the common, may interest those who have not had an opportunity of seeing this plant in some other situation.

Amongst the Endogenous genera here noticed, economical use is almost entirely confined to the Grasses and Rushes; yet it is not likely that the remaining splendid vegetation is designed for ornament alone, although that object is most extensively pursued in the whole material creation.

III. Dicotyledonous (or *Exogenous*) Plants.

As the Cryptogamous division of the vegetable kingdom prevails in the more northern climes, and the Monocotyledonous in the more southern regions, the Dicotyledonous seem naturally to prevail in temperate climates; for even the grasses of the climate are, in a great degree, the result of husbandry.

Some of the plants now under consideration, indeed, may often be observed in flower during the most torpid part of the winter. And, in the earliest months of the year, long before the sun has returned to our hemisphere, the relaxed catkins of the hazel, and the bursting flower-buds of the elm along every hedge-row, the banks and walls glittering with Draba verna, and the meadows covered with the earlier Veronicas, give us sufficient proof that our summer herbage had not been dead, but asleep. The sheltering woods and hedges, too, soon induce their timid clients to trust their soft petals, for a few hours, to the open air.

April, however, witnesses in this country, the chief struggle between the departing and the coming season. And the

Digitized by Google

progress of vegetation is rapid or slow, in proportion to the prevalence of the latter or the former.

But, "as soon as the golden sun has completely vanquished the winter, and opened up the sky with the light of summer," Flora then leads out her whole family, rejoicing in their new health and vigour, and vying with each other, as it were, in the beauty and the variety of their dresses.

During several months of the summer, indeed, upwards of two hundred species may be gathered in flower, about Warley Common, in the space of one day.

Amongst the most abundant ornamental flowers on the common, besides the beautiful Ulex, are, patches of Veronica officinalis, Erica Tetralix, Trifolium subterraneum, Anagallis tenella and cærulea, Ornithopus perpusillus, Drosera rotundifolia, Menyanthes trifoliata, and Polygala in all its varied beauties.

Doronicum plantagineum, Borago orientalis, and Linaria bipartita, have not, I believe, been elsewhere in England noticed growing apparently wild, certainly in this situation spontaneously.

At the conclusion of the paper, Dr. M. remarked, that he had collected, in conjunction with a friend, 205 species in the neighbourhood of Warley, in one day's excursion.

DECEMBER 15TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Dr. Mac Intyre communicated some further remarks relative to the spontaneous vegetation of the vicinity of Warley, Essex, after which Mr. Dennes read the results of his excursions in the neighbourhood of Deal and Walmer, in which he principally confirmed the stations for the rarer species given in Mr. Watson's New Botanist's Guide. The following are the principal localities:—

Lathyrus pisiformis . Stony Beach between Walmer and Kingsdown, August, not common.

Silene conica . . . Heath near Sandown Castle, very scarce, and not in flower in August.

Digitized by Google

Medicago minima?	Heath near Sandown Castle; very scarce in August.
Glaucium luteum	Very common about Deal and Walmer; August and September.
Bunias cakile	One Specimen on the beach, between Deal and Walmer, in August.
Linum angustifolium.	Cliffs at Walmer, near the Castle, common in August.
Crithmum maritimum.	Dover Cliffs, and Cliffs at Kingsdown, scarce in August and September.
Statice spathulata	Dover Cliffs, and Cliffs at Kingsdown, common in August.
Salicornia herbacea	Heath near Sandown Castle, common.
Phalaris canariensis.	One Specimen near Deal Castle, in August.

JANUARY 5TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Mr. Daniel Cooper read a Paper "*On the distribution of plants in Battersea Fields, Surrey, accompanied with a map or plan exhibiting, on the scale of two feet to the mile, the particular localities of the rarer species.*" The following is an extract:—

BATTERSEA FIELDS is situated at a distance of about three miles from the principal bridges of the metropolis, in the parish of Battersea, county of Surrey.

This locality has been for years past famous for the profuse supply of specimens it has yielded to the Botanist, to the Entomologist, and to the Conchologist. To the Botanist in particular, Battersea Fields offers an extensive field for research, and there is but little doubt that in years past, if we may credit such authorities as Martyn, Curtis, Merrett, and others, that it was a richer locality than it is even at the present time; it has also been for some time the general resort of simplers or herb-gatherers, for the supply of the London

Digitized by Google

market, on account of the great profusion of certain herbs or simples which abound there; hence arose the old saying, "*Go to Battersea to be cut for the simples.*"

This locality extends for about a mile and a half in length, from Nine Elms to Battersea village, and varying from half a mile to a mile in breadth, extending from the river Thames towards the Wandsworth Road; on account of its occupying so great an extent, it necessarily offers some slight variation, such as cultivated fields, meadows, pastures, &c. Being for the most part situated below the level of high water mark, the meadows and pastures are more or less watered, although the tide is kept out by means of a high embankment on the border of the river. Interspersed between the meadows and pastures, are small ditches, or streamlets, which, from their being often overflowed by the draining from the fields, keep the ground more or less supplied with moisture. It is more particularly in these ditches and streamlets that the Botanist, Entomologist, and Conchologist, delight to seek the productions of nature; which being mostly formed of stagnant water, abound with interesting specimens to the naturalist; moreover, since it has been ascertained that particular tribes feed, and are found attached to particular plants, or tribes of plants, it follows that from this locality which offers more than one-half of the natural orders, rather less than one-half of the genera, and more than one-fourth of the species, of flowering plants, indigenous to Britain, many insects will likewise be found.

The substratum is a stiff clay, except in those places where for cultivation, chalk, and other soils, have been introduced, in order to render the land fit for the produce of such crops as the farmer may consider necessary.

Battersea Fields may be conveniently divided into six distinct and nearly equal parts; the first division of which, is the meadows and pastures; the second, the cultivated fields; the third, the osier grounds; the fourth, Battersea Common; the fifth, the ponds and ditches, &c.; and lastly, the market gardens, together with a portion of Wandsworth Common, in the parish of Battersea.

(Here followed a brief notice of each particular district, with a list of some of the rarer species found in them.)

What will become at length of this rich locality? of this "*The wild Botanic garden of London,*" as it may be termed; the place where most of our ancestors and ourselves have so

Digitized by Google

often rambled, with profit and delight, when railroads extend into this, the metropolitan Botanist's favourite locality, overturning and obliterating some of nature's choicest productions? Our only alternative in this matter, will be to work together in order to arrive at the greatest accuracy, and produce a plan or plans of the nature here exhibited; that at a future period when railroads, and such like public undertakings, have demolished our richest locality in the immediate neighbourhood of this metropolis, we shall have at least a plan to show our descendants that a place existed which abounded in so profuse a supply of plants at a stone's throw from London; with this view it was, that I undertook the execution of the map, or plan, and hope that this rough sketch, as an example, will be followed up by the members; so that, in the course of a short period, we may have in our possession, plans exhibiting the distribution of plants through at least England, Wales, and Scotland, as well as those of the continent, and, finally, in whatsoever direction our working members may be called.*

Annexed will be found the summary of the whole of the flowering plants, which are, and have been, known to grow there, under their respective Natural Groups. Of the one hundred and four natural orders of British flowering plants, mentioned in Dr. Lindley's First Edition of his Synopsis of British Flora, sixty are found in this locality. Of the five hundred and three genera of British flowering plants, two hundred and fourteen are here distributed; and, lastly, out of the one thousand five hundred estimated species of British flowering plants, four hundred and six are here found dispersed; thus in this piece of ground, which I believe measures one mile and a half in length, and one mile in breadth, we have more than one-half of the British natural orders, as sixty to one hundred and four, not quite half of the genera, in the ratio of two hundred and fourteen to five hundred and three, and rather better than one-fourth of the species in the ratio of four hundred and six to one thousand five hundred; the localities of which were published in the Flora Metropolitana, 1836.

* Since the above paper was read, Mr. M. H. Cowell has produced a map illustrating the Flora of Faversham, Kent, and Miss C. Perry has also forwarded a map exhibiting the distribution of plants in the neighbourhood of Haslemere, Surrey, in which the localities of the plants are marked off.

Digitized by Google

The following Table will show the number in each tribe :—

			Genera.	Species.
I. Dicotyledons, 45 orders	37	Dichlamydeæ	158	272
	6	Monochlamydeæ	11	39
	2	Achlamydeæ	2	7
II. Monocotyledons, 15 orders	13	Petaloideæ	19	31
	2	Glumaceæ	24	57
		Total	214	406

Mr. Thomas Hancock then communicated some Notes on "*Plants found near Bristol, in September* 1836." He thus commences :—

In the following remarks, I intend to mention merely a few of the more interesting plants which I met with during an excursion with several gentlemen of the British Association, as far as Penpool and Blaize Castle, (about eight or ten miles North West of Bristol) in the early part of September last, commencing with

Erodium : both cicutarium and moschatum, we found in the loamy earth between the crevices of the rocks at Penpool.

Polygala vulgaris. Pretty common about the fields and hedges.

Lamium maculatum. A rare plant in both Gloucestershire and Somersetshire, to be found in only one locality near Bristol. Was this originally a native of Britain, or introduced from the Continent? In Turton's Edition of Linnæus, it is described as exclusively an inhabitant of Italy and Germany. The same author adds, that the leaves have a longitudinal white patch; I have seen several specimens, but never noticed this.

Galeopsis ladanum. Very common.

Myosurus minimus. Near Penpool and Blaize Castle, in sandy fields.

Oxalis : both acetosella and corniculata, are met with here, among the hedges and moist places, near corn fields.

Galium. The following species were met with : saxatile, Aparine, Mollugo, palustre, spurium and verum.

Ranunculus : acris, aquatilis, and bulbosus, are common; the genus is very poisonous.

Digitized by Google

Convallaria multiflora. This we found in excellent state of flowering, although so late in the year as September.

Mercurialis perennis. A solitary specimen. The extraordinary and beautiful powder with which this plant is besprinkled, although stated by some to be merely saponaceous mealy excrescences, I should rather consider as utricular glands.

Plantago. Nearly all the indigenous species, very common; P. maritima, on a wet heath, near Penpool.

Atriplex angustifolia.

Cistus Helianthemum, and guttatus. A few specimens. One specimen of C. marifolius was found on Penpool rocks, by Mr. Rootsey. This genus, I find, is omitted in the catalogue of the British Flora, published by the Botanical Society of Edinburgh.

Polygonum. The plants of this genus are abundant in every direction round Bristol. P. Convolvulus rather rare. Found P. aviculare in only one spot, where it grew abundantly. I have been informed by my friend, Mr. Rootsey, that, at certain times of the year, this plant is frequented by vast numbers of birds, who come to feed upon its seeds.

Limosella aquatica. In pond, near Blaize Castle.

Humulus lupulus. Abundant in the hedges.

Ilex aquifolium. The hedges of a lane were lined all along with this plant.

Erica. This beautiful genus is here displayed in profusion and luxuriance; E. vagans, cinerea, Tetralix, abound on the heaths.

Symphytum officinale. In flower. In all the descriptions of this plant, which I have read, I have never seen it noticed that its root is præmorse or truncate; which appearance was predominant in two specimens I saw in Somersetshire.

Hypericum: perforatum and quadrangulum. Pretty common.

Clematis vitalba and Callitriche verna.

Iris pseud-acorus. Very common in clayey soils about Bristol.

Allium oleraceum. The seeds of this plant are employed by the country people of Somersetshire and Gloucestershire, in making soup.

Chlora perfoliata. In flower, on calcareous soil.

Colchicum autumnale. A rare plant in this part of the country, in fine state of flowering.

Digitized by Google

Carex sylvatica, pauciflora, and muricata. By the side of a heath, near a brook. Respecting this genus I may remark, that no wonder it contains such a number of species, when both monœcious and dicecious plants are retained in it, and yet it is placed in the Class Monœcia.

Eupatorium cannabinum. Rather rare.

Chenopodium. Several species on the sea-shore at Penpool.

Trifolium. A very common genus here. Of T. ochroleucum, found only one solitary specimen.

Mentha. Very abundant along the sides of the rivers, hedges, &c.

Pedicularis palustris. On some gravelly hillocks, near Blaize Castle.

Anagallis arvensis. A rare plant in this part of the country, in moist meadows and corn fields.

Statice. Armeria and limonium. Near the sea-shore at Penpool.

Malvaceæ. The plants of this tribe are very scarce in this part of Gloucestershire. Malva sylvestris, and M. Rotundifolia we met with in only two or three places. Althæa officinalis is pretty plentiful near Penpool.

Cardamine pratensis. A few specimens.

Clinopodium vulgare: Antirrhinum majus, with Linaria spuria and Elatine.

Tilia europæa. Two or three specimens among the woods.

Ligustrum vulgare.

Tamus communis. An uncommon plant here. But on the South West coast of Somersetshire, near Watchet, on the Bristol Channel, it lines almost every hedge for miles around. It is there esteemed a great remedy for chilblains, and is termed by the natives *Road-berry*, from the circumstance of its always growing on the side of the hedge, facing the road.

Glaucium luteum. A few specimens on a muddy heath, near Penpool.

Galanthus nivalis. A single specimen.

Juniperis communis. Rather common in the hedges.

Digitalis purpurea. Very abundant in all clayey and gravelly soils here.

Viola. Several species.

Œnanthe crocata. Plentiful.

Pæonia officinalis. This was found by Mr. Rootsey, growing *wild* in a thicket of bushes, near Blaize Castle, which

Digitized by Google

would go to disprove the statement that it was *introduced* into this country. There were two or three specimens, but not in flower.

That beautiful tribe of plants, the Ferns, are here displayed in profusion. Specimens of almost every indigenous genus may be collected in one day's excursion, from Bristol to Blaize Castle. Those most common or abundant, however, are the Genera Asplenium, Aspidium, Lycopodium, Equisetum, and Scolopendrium.

JANUARY 19TH.

W. H. WHITE in the Chair.

A continuation of Dr. Mac Intyre's Paper, on the Flora of Warley, Essex, was read, comprising the concluding part, as inserted at page 18.

FEBRUARY 2ND.

J. E. GRAY, Esq. F.R.S., President, in the Chair.

Mr. J. Freeman read a Memoir entitled, "*Hints on the Importance and Practicability of adopting a more Systematic Method in describing and arranging the Species of Plants.*"

The author proposes to arrange the Species of British Plants in Tables, and endeavours to show the many advantages it will afford to the young student in the rapid determination of the species.

The following is an abstract of the paper:—

Genus—THALICTRUM.

Analysis of the Species.

Stem perfectly simple, with a simple terminal cluster . . . . . Alpinum

Digitized by Google

Leaves doubly pinnate
Stem zig-zag . . . . Minus
Stem erect, furrowed . . . Flavum
Leaves triply pinnate
Leaflets glaucous beneath . . Majus

In the genus *Anemone*, there are four British species, and about thirty-four characters are usually employed for their description; but it is conceived, that about nine or ten only, are absolutely necessary for the purpose, and may thus be arranged in a tabular form:—

ANEMONE.

Analysis of the Species.

Petals 5, elliptical . . . Ranunculoides
Petals 6,
Involucrum in deep linear segments
Fruit with feathery tails . Pulsatilla
Involucrum of three ternate lobed leaves
Fruit without feathery tails . Nemorosa
Petals numerous and lanceolate . Apennina

The species of the genus Ranunculus, are separated into two divisions only. The first division consisting of those which have their leaves simple, and the second of those having lobed or cut leaves: but we might subdivide the latter division which consists of twelve species, into four secondary divisions; the first, including those having the stem erect; the second, those with a prostrate stem; the third, those having a creeping stem; and the fourth division consisting of those which have a floating stem. And whereas about one hundred and twelve characters, including repetitions, are usually employed in the description of the British species of Ranunculus, considerably less than half that number would suffice.

The plan of classification that has been proposed, is not however, meant to supersede, but to accompany a more detailed description of species, which might be given, as has been already remarked, beneath the analytical table; for even the minutest particular relating to the structure or economy of plants, is of too much importance to be overlooked; but at the same time it is highly desirable that the facts that have been astertained, should not be heaped together in confusion, presenting to the mind nothing but a 'rudis indigestaque

Digitized by Google

moles,' which by its unsightly appearance repels inquiry, and discourages investigation; but it is of the utmost importance that these facts should be arranged and classified, in such order, as will best illustrate their connection and mutual relation.

Mr. G. E. Dennes communicated the result of his researches in the neighbourhood of Deal, Walmer, Dover, and Sandwich, Kent, in August and September 1836; and stated that he had discovered in the vicinity of Deal and Walmer, during his short stay, eighty-four genera, including one hundred and twenty species, and considers that the number might be much increased at other seasons.

FEBRUARY 16TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Mr. W. A. Lewis communicated a Paper on the Natural Order *Ranunculaceæ*, in which he alluded principally to the opinions of M. Decandolle.

MARCH 2ND.

DR. MACREIGHT, V. P., F.L.S., in the Chair.

Mr. H. A. Meeson read a Paper on the Classification of plants, and enumerated the advantages to be derived from studying vegetables according to the Natural system, pointing out its superiority over the Linnæan Artificial arrangement; but, at the same time, acknowledging with deference that the system of that great naturalist was the means of rescuing the science from oblivion, and concluded by stating that Linnæus himself was engaged, even to his death, in forming a Natural Arrangement of Plants, seeing that the laws of his former system were liable to great variation.

Digitized by Google

MARCH 16TH.

J. E. GRAY, ESQ., F.R.S., President in the Chair.

Mr. John Reynolds made some remarks on the Chinese plants described in Kirscher's History of China. The first alluded to was the *China Rose*, which is stated to have the peculiar property of changing colour twice a-day, from purple to white, from the loss of some peculiar ammoniacal principle.

The second mentioned was a plant analogous to Sago, possessing a farinaceous pulp, extensively employed as an article of food in those regions, and known to the natives by the name of *Quang lang*. A third, *Clavaria*, was noticed, and which was stated to grow only on insects.

Several others possessing singular and peculiar properties, as described by Kirscher, were described.

Mr. R. Leylands of Halifax, Yorkshire, forwarded to the Society specimens of a Moss, new to Britain, called *Cinclidium stygium* discovered on a moor near Maltham Tarn, in Yorkshire, by Mr. John Nowell, of Halifax, who had paid particular attention to the lower tribes of plants. The President then instanced several examples in which specimens were often forwarded to the British Museum to be named, collected by persons in humble life in various parts of this country.

APRIL 6TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Mr. W. M. Chatterley read a translation of M. Alphonse Decandolle's dissertation on the Geographical distribution of the plants used as food, confining himself more particularly to the theoretical and statistical portion of the subject. The paper was extracted from the fifth number of "La Bibliothèque Universelle de Geneve," for April and May, 1836.*

Dr. Bossey exhibited a specimen of *Potentilla supina* found by him near Woolwich, Kent.

* The translation appeared in the Magazine of Popular Science, Vol. 4, 1837.

Digitized by Google

APRIL 20TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Mr. Chatterley read a continuation of his Paper, translated from the French of M. A. Decandolle, on the geographical distribution of plants, used as food. This portion of the paper contained several facts connected with the dispersion, according to the climate and temperature, of the Gramineæ, and the several uses to which they are applied by the people of different nations.

The President afterwards communicated to the Society, the recent discoveries of a French Botanist, read before the Academy of Sciences at Paris, in March last in the leaves of *Kylanium*. From each of the spiculæ, a number of membraneous cylinders were found to be constantly projecting, which afterwards became contracted; and by the aid of a powerful glass, this may be seen in specimens preserved for forty years. The President stated that he had since performed the experiment with success.

Mr. T. Hancock then read some notes on "*Lamium Maculatum*," of which the following is an extract:—

HAVING seen many specimens of this plant, entirely destitute of the large white spots, so particularly insisted on by authors as its most important specific mark of distinction,—as well as from having seen several with white flowers, and approaching so closely, nay, almost running into, *Lamium album*, as to be hardly distinguishable from it,—I have been induced to pay some little attention to the subject, and the results are contained in the following remarks.

This plant, *Lamium maculatum*, is exceedingly rare in both Somersetshire and Gloucestershire. My friend, Mr. Thwaites, last year forwarded me a specimen of the white variety, which he obtained at Retland Court, six or seven miles from Bristol, and which, he said, was the only habitat for it near that city, with which he was acquainted. I have since seen other specimens of the white flower variety, closely approaching in habit and general appearance to *L. album*, but having fewer whorls; and in none have I found the

Digitized by Google

longitudinal white patch on the leaves, mentioned by most authors as the chief characteristic of the species.

Dr. Hooker however, says, that the flowers are *constantly purple*, and adds, on the testimony of Sir James Smith, that the large white spot on the leaves appears principally in the winter and early in spring; but he continues, "they are not represented so in the English Botany, and the plant is widely different from what is cultivated as L. maculatum in our gardens, which has the leaves vastly smaller, with a large white spot on all of them, and is well figured as the true maculatum, in Reichenbach's Ichonographia."—*British Flora.*

Now, as far as my limited experience goes, I should consider that Sir James Smith was quite correct in his description of the plant as the *true* maculatum; and that the specimen from which his figure was taken, was at the time destitute of the white patches on the leaves. Further, since we find the leaves of *L. purpureum* to be *invariably smaller* than those of either *maculatum* or *album;* and since we know that changes in the colours of leaves, as well as of flowers, take place from different soils and modes of culture, I am induced to believe, that the garden-plant figured by Reichenbach as the true maculatum, and adopted by Dr. Hooker as such, is no other than *purpureum.* Or, since this would be doubting the accuracy of those illustrious Botanists, it is on the other hand highly probable, that Reichenbach and Hooker's specimens might have been monstrous vegetables, uniting certain qualities of the two in one; for we know that such structural changes in plants do take place, and tend more to mislead, than if we take nature herself for our guide.

With regard to the whorls—their number cannot *alone* be reasonably regarded as a specific mark of distinction; and in this consists the chief difference between *maculatum* and *album.* Dr. Lindley disregards these, the whorls, and unites the two as varieties; making *purpureum* a separate species, and giving to them the specific name of *vulgatum.* He however makes no mention of the leaves being inciso-serrate, while this is particularly remarkable in both plants.

I would direct attention, therefore, to the following facts, which strongly support the assumption, that *album* and *maculatum,* are but varieties of one and the same species. The leaves, in both, are invariably serrate, or inciso-serrate; in *maculatum,* they grow to as large a size as in *album,* have the same appearance, and are both subject to the occasional or

Digitized by Google

periodical white spots. In general appearance, the two plants are both rugose, sometimes villous; and the flowers of maculatum are in colour either white or purple. The only point of difference then, that I can perceive, is in the number of flowers borne on the whorls; which, in *album* is reported to be twenty, and in *maculatum* ten; and this, I would venture to suggest, is no more entitled to the honour of the term *specific distinction*, than variations in colour.

With regard to *L. purpureum*:—I have not had sufficient experience with this species to enable me to decide on its exact affinities with those of which we have been treating; but, from Hooker's and Reichenbach's observations, I should consider it equally subject to acquire the white patches on the leaves; I think myself justified in stating, that if careful attention be paid to the three species, the marks of distinction between *purpureum* and *vulgatum* (or album and maculatum combined) will be found to be but trifling indeed. It would also serve to give us some just notions of the various gradations which plants undergo, there being doubtless in existence specimens intermediate between the species of many genera. And as we proceed in our investigations, we shall find that no subject in nature is isolated, but that each and all form a regular series of connecting existences; our distinctions of species being in many instances imaginary, and mistaken for realities, because we cannot observe the whole series, but only a link here and there.

Mr. Reynolds continued his remarks on the Plants described in "*Kirscher's China illustrata.*"

MAY 4TH.

MR. WHITE in the Chair.

Mr. REYNOLDS concluded his observations on the Plants of China. A paper was read from Mr. Arthur Wallis, entitled, "*A Catalogue of some of the rarer Plants, growing in the vicinity of Chelmsford, Essex.*"

ALTHOUGH the Flora of this part of Essex presents no very striking peculiarities, yet, nevertheless, several rare and interesting species are to be found, ornamenting the hedges and fields, with the multitudinous variety of colour, form,

Digitized by Google

and size, which they present. The town of Chelmsford is situated in the centre of a flat but highly cultivated district, and but little interspersed with woods and heaths, which latter are annually being decreased in size and number, by the levelling hand of human industry. From this scarcity, of what may be called oases to the lover of nature, though deserts to the agriculturists, it is, that the Essex Flora partakes more of an agrarian character than any other, there being so few stations suited for the growth of alpine plants.

There are many plants named in the following catalogue, which cannot be said to be *rare*, although but sparingly distributed in the particular locality of Chelmsford. But care has been taken that mention should be made of such as may serve to elucidate the harmony of nature in the geographical distribution of the vegetable kingdom.

The genus *Veronica* may be first mentioned, of which two of the less common species have been found near Chelmsford.

Veronica cutellata, which I formerly gathered in one spot on the banks of the Chelmer has been for the last two years extinct there.

V. montana, grows plentifully, close by the original station, for the last mentioned species; flowers of a much paler blue, than those of V. Chamædrys.

Iris fœtidissima. A small copse, at Writtle, near Chelmsford; but very sparingly.

Alopecurus fulvus. Widford, on Chelmer banks. Chelmsford is very barren of the rarer of the British grasses; but the pastures are remarkable for their richness and luxuriance. I have only thought this, and the following sufficiently uncommon to be mentioned here.

Bromus secalinus. Sandon, near Chelmsford.

Lolium temulentum. Danbury; there seems but little difference between this noxious species and L. Arvense.

Asperula odorata. Wood at Great Leighs.

Myosotis collina. Hedge-banks at Springfield, near Chelmsford; a delicate little species, flowering quite early in the spring.

Lysimachia vulgaris. Springfield; at the same place are also found L. Nemorum and L. Nummularia.

Primula elatior. Springfield. The flowers of this species were much larger than those of P. veris, and of a bright yellow; the umbel generally consisting of from six to eight flowers.

Digitized by Google

Hottonia palustris. In a ditch, near Chelmsford; flowers very *large*, and handsome.

Samolus Valerandi. Writtle. I have gathered specimens nearly a foot high.

Campanula Rapunculus. Danbury Common, near the seat of S. Phillips, Esq.; very sparingly intermixed with C. Rotundifolia: about two feet high; flowers more truly campanulate.

Campanula hybrida. This species I have occasionally found in corn-fields in the vicinity of Chelmsford, and in one or two instances with the blooms as large as a sixpence, and nearly approaching in appearance to the C. speculum.

Gentiana Amarella. Broomfield near Chelmsford.

Bupleurum rotundifolium. Springfield; in a chalky soil.

Sambucus Ebulus. Danbury, near Chelmsford.

Myosurus minimus. Corn-fields in the neighbourhood. In some cases I have observed the receptacle to be upwards of three inches.

Peplis Portula. Danbury Common, near Chelmsford.

Narcissus Pseudo-Narcissus. Abundantly in a wood at Broomfield.

Convallaria majalis. In a small copse at Danbury.

Acorus Calamus. On banks of the Chelmer, in Springfield.

Epilobium angustifolium. Danbury, near the Rodney Inn.

Daphne Laureola. In a wood at Waltham, near Chelmsford.

Polygonum Bistorta. Danbury.

Paris Quadrifolia. Thrift-wood, near Chelmsford.

Adoxa Moschatellina. Shaded banks, Springfield.

Butomus umbellatus. Banks of ditches, and of the Chelmer, near Chelmsford.

Chrysoplenium alternifolium. In a ditch in the Thrift-wood, with C. oppositifolium.

Dianthus Armeria. Near Galleywood Common, Chelmsford.

Fragaria elatior. In a wood at Great Leighs; assuredly wild.

Thalictrum flavum. Springfield.

Anemone nemorosa. Frequent in copses, near Chelmsford.

Ranunculus parviflorus. Abundant on a bank at Springfield.

Digitized by Google

Mentha rubra. Great Leighs, near Chelmsford.

Galeobdolon luteum. Near Galleywood Common.

Lamium amplexicaule. This I have found in a cultivated field at Danbury.

Scutellaria minor. Galleywood Common.

Linaria spuria, } Growing together in corn-fields, near
— *Elatine.* } Chelmsford.

Orobanche major, and *O. elatior.* On the roots of Broom &c., at Danbury Common.

(Read June 1st.)

Some Remarks under the above title were read before the Society, on May 4th; during the past summer I have corroborated the stations I then gave for several plants, and discovered fresh ones for some others, comprising:—

Utricularia vulgaris. This plant grew abundantly in a pond at Broomfield, near Chelmsford, and was gathered in July, 1837; its large and beautiful blossoms rendered it a striking object when floating upon the water, which was of a considerable depth; and the roots or subaquatic foliage were several feet long, consisting of an innumerable multitude of fibres, studded with minute vesicles, which at this period were filled with air.

Erythrea Centaurium (white variety). Found upon the cliffs at Southend, Essex; the pink variety was growing plentifully with it.

Bupleurum falcatum. This species, which was so recently discovered by my friend Thomas Corder, grows plentifully at a village called Norton Mandeville, near Ongar, Essex, about five miles from Chelmsford. The umbel is of a light yellow, and the leaves falcate, and of a brownish green. The root is fibrous, and seems to flourish best in shaded banks, where it attains the height of four or five feet. It generally flowers rather late in the summer; specimens having been gathered so late as the 29th August.

Allium ursinum. This plant seems rare with us, it is found in the Thrift-wood, near Chelmsford, and even there but very sparingly.

Triglochin palustre. On a common at Danbury, Essex. The most striking peculiarity of this plant seems to be its capsules, which as they advance to maturity, attain a very considerable length.

Digitized by Google

Epilobium roseum. In an obscure situation at Little Baddow, I found a few solitary specimens of what I take to be this. It seems to accord best with the description of that plant by Hooker and others. The thin and delicate leaf, and minute pink flower, render it a very elegant little species.

Butomus umbellatus. This beautiful aquatic, which is not uncommon in this neighbourhood, I gathered in July at Springfield, near Chelmsford.

Scutellaria minor. I obtained excellent specimens of this plant at Little Baddow Common, flourishing best among the furze bushes, with which the common is studded.

Corydalis claviculata. Springfield, Essex.

Gnaphalium minimum. This species, which I never observed till this year, I found at Danbury, growing with its allies (*G. rectum* and *uliginosum*). The specimen did not exceed the height of about six inches.

Typha angustifolia. Abundant in a pond at Sandon, Essex. The narrow leaf and much smaller catkin appears to be the distinguishing features from *T. latifolia.*

Myriophyllum verticillatum. This plant is found growing plentifully in an obscure and shaded pool in Springfield, and which was so encompassed by the *Lemnæ* and *Callitriche,* as to be scarcely visible. When first discovered, which was in June last, I gathered specimens of it, and again in July; it was curious to observe the difference in the foliage, as it gradually ascended out of the water. Those specimens which were gathered early, and covered with a dense mass of thread-like leaves, as they became exposed to the air, shot forth minute leaflets, giving the plant an ornamental appearance. Thus it will be seen, that however necessary water may be to vegetation, its maturity can never be effected without the assistance of the atmospheric air and the solar rays.

Epipactis palustris. On Galleywood Common, near Chelmsford, though by no means plentiful. I have never observed this species attain a considerable size, and have universally remarked, that the tops of the leaves become decayed; but from what cause I am unable to say.

FERNS.

The four undermentioned species of ferns were all gathered in one spot namely, Danbury Heath, Essex, which was overgrown with underwood, and rendered moist by numerous springs. The *Aspidium Oreopteris,* appears to me to be

Digitized by Google

satisfactorily determined, from its blunt and entire segments and marginal sori; though from its fondness for alpine situations, I was almost inclined to doubt the identity of the specimens sent with the plant in question.

The following are the four species forwarded:—

Aspidium Oreopteris,
—— *spinulosum,*
—— *dilatatum,*
Blechnum boreale.

(*Third Part.*)

THE first part of this Memoir concluded with a notice of the orders Labiatæ and Scrophularineæ, which are but sparingly dispersed in this immediate neighbourhood. It will, therefore, be best to proceed with those plants arranged under the class Tetradynamia of Linnæus, or the order Cruciferæ of Jussieu; among which, the first that I find sufficiently uncommon to demand notice, is the *Cochlearia Armoracia,* which is plentiful on the banks of the Chelmer, and to all appearance decidedly wild, though Dr. Hooker seems to doubt whether it is really a native.

Cardamine Amara. On the banks of the Can, Chelmsford, growing in such luxuriance as sometimes to attain the height of nearly two feet.

Coronopus Didyma. This plant formerly grew on a hedge-bank near Chelmsford, from whence it was gathered; but it is now extinct there, the seeds having probably been brought in some manure, which was deposited close to the spot.

Erodium cicutarium. Little Baddow, near Chelmsford.

Geranium Pyrenaicum. Danbury Hill, near Chelmsford.

G. Columbinum. Growing with the last, but very sparingly.

Corydalis claviculata. Hedge-banks, near Chelmsford. This very delicate little flower, which Hooker says, "is most abundant in the Highlands," seems to be rare in this vicinity, growing only on shady banks, mostly excluded from the sun.

Genista tinctoria. Galleywood Common, Chelmsford.

Lathyrus Aphaca. In a clay-pit, near Chelmsford.

L. Nissolia. Growing with the last, and probably elsewhere; but, from its grass-like leaves, it is easily overlooked. That very rare species, the *L. hirsutus,* is found at Rochford, and also at Nazing; both in Essex.

Digitized by Google

Vicia sepium. Common on hedge-banks, &c. I have found a variety of this plant with *white* flowers, and pale green leaves, but not differing materially in other respects.

Ornithopus perpusillus. Gravelly pastures, near Chelmsford.

Trifolium subterraneum. Galleywood Common, Chelmsford; where it flourishes, almost buried beneath the turf.

T. ochroleucum. Clay-pit, near Chelmsford, with *Lathyrus Aphaca.*

T. medium. Broomfield, near Chelmsford; very similar in appearance to T. pratense, but of a deeper purple, and having larger leaflets.

Medicago maculata. Abundantly at Springfield, near Chelmsford; leaflets invariably marked with a black spot, in the centre.

Hypericum Androsæmum. Danbury Park, near Chelmsford; but sparingly.

Crepis biennis. Banks of Chelmer. This species is quite distinct from C. tectorum, in having larger flowers, and hairy involucre.

Cichorium Intybus. Margaretting, near Chelmsford.

Carduus tenuiflorus. Feering, near Chelmsford; abundantly.

Conyza squarrosa. Springfield, near Chelmsford. This plant I found formerly in this neighbourhood, but it now appears extinct; although I believe it is by no means uncommon.

Doronicum plantagineum. I have cultivated specimens of this plant, which were procured from Saling, Essex; but I consider it is not entitled to a place in the Local Flora.

Achillea Ptarmica. In ditches, Springfield Common.

Anthemis nobilis. Abundantly on Galleywood Common; where it grows so luxuriant, as to be sought for by chemists and others, for its valuable medicinal qualities.

Centaurea solstitialis. In a field at Springfield, Essex, growing among *Medicago sativa;* but most probably introduced with the seed with which the field was sowed, as I have never found it anywhere else in the neighbourhood.

*** In the very interesting family of Orchideæ, I will enumerate all that are found in this part of Essex. None of the species noticed are abundant, as the soil is of a light gravelly nature, and in many districts consisting of a strong loam, which is by no means calculated for a plentiful development of this beautiful tribe.

Digitized by Google

Orchis Morio. Wet meadows at Springfield; where I have gathered it with a spike of flowers from three to four inches long.

O. mascula. Springfield and Writtle.

O. maculata. Near the Chelmer, Chelmsford.

Gymnadenia Conopsea. Writtle, near Chelmsford.

Habenaria bifolia. Woods at Broomfield. I have gathered specimens of this species about two feet high, with a spike of flowers nearly ten inches long.

Ophrys apifera. Great Leighs, near Chelmsford; where I have obtained very fine specimens.

Neottia spiralis. Danbury Heath, Essex; a very obscure delicate litte plant.

Listera Nidus-avis. Newland's Wood, Broomfield; sparingly.

L. ovata. Thrift Wood, near Chelmsford.

Epipactis palustris. Galleywood Common, Chelmsford.

E. latifolia. Broomfield, near Chelmsford.

Euphorbia platyphylla. Great Leighs, near Chelmsford.

Sparganium natans. Broomfield, near Chelmsford.

Carex pulicaris. Galleywood Common, Chelmsford; which is also a station for the following species:—

C. stellulata, remota, pendula, pallescens, flava, binervis, panicea, recurva, acuta, vesicaria.

Viscum album. Common on the apple tree, and *Prunus spinosa,* in Sir J. Tyrrell's Park, Boreham, near Chelmsford.

Humulus Lupulus. Common, and to all appearance indigenous.

FERNS.

Aspidium lobatum. Springfield; not uncommon.

A. angulare. Chelmsford. This is the species frequently known by the name *A. aculeatum.*

A Thelypteris. In a boggy wood, at Danbury.

Asplenium Trichomanes. Shaded bank, Chelmsford.

A. Adiantum nigrum. Growing with the above.

Scolopendrium vulgare. Springfield, Essex.

Osmunda regalis. Danbury, Essex; very luxuriant.

Lycopodium clavatum. Danbury, Essex.

Of the *Equisetaceæ* which flourish at Chelmsford, there are *E. fluviatile, E. arvense, E. sylvaticum,* & *E. limosum.*

Digitized by Google

Mr. G. E. Dennes read a Translation of Professor Meyen's Memoir, on the Circulation of the proper juice in plants.

MAY 18TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

A Paper was read by Mr. Manley Hopkins on the subject of Vegetable Fermentation, of which the following is but a brief abstract.*

"The author, after remarking on the changes and mutations which are continually undergoing in bodies—in the vegetable and mineral kingdoms in particular—proceeded, first, to describe the phenomena attendant on the formation of sugar, and the various modes in which sugar is formed. Mr. Hopkins conceives, that all the products of fermentation arise from the diminution of carbon; and that the great discrepancies which we find in the analyses of different chemists, is to be accounted for by the various objects they had in view, while instituting their experiments; for instance, in the relative degrees of purity and of dryness, and chiefly from the presence of other substances, which, though bearing an affinity to the body under examination, should nevertheless be considered distinct, as having a different elementary composition. By the process of fermentation, the nature of sugar becomes entirely altered, and with it are also changed and modified the other ingredients which were in combination with it—its great characteristic, sweetness, being entirely lost. From the experiments of Berzelius, Berard, Gay Lussac, and Thenard, it would appear, that in the former periods of fermentation, carbonic acid is always disengaged: this, however, is not a necessary process. The oxygen which is used, goes into combination, and not to produce carbonic acid gas. The author is of opinion, whatever the results of Rosin's and Saussure's experiments may be to the contrary, that acetification depends almost exclusively upon an internal

* The following report is extracted from the Meeting of the Society in the Athenæum, June 3rd, 1837.

Digitized by Google

action; and that the atmospheric air is of no further use than in furnishing nitrogen to aid the process. Gluten, when present, is certainly a great incentive to fermentation, and it is further heightened by acetic acid. The development of heat may be accounted for, first, by the theory of the co-production of alcohol; and secondly, from latent heat being developed when the oxygen enters into the state of acid. In the process of putrefaction, there is always a re-carbonization of part of the ingredients, and a consequent evolution of hydrogen. But though immense masses of vegetation are continually undergoing destruction, by a disorganization of their component elements, these afford nutriment for a new generation; and it is clear that there is also a symmetrical proportion in the various other departments of nature,—that the same causes which operate on one part of her works, very frequently operate alike in the other departments. A discussion afterwards ensued upon the various topics broached by Mr. Hopkins, after which the Society adjourned."

JUNE 1st, and JULY 6th.

J. E. Gray, Esq., F.R.S., President, in the Chair.

At the former meeting, the second part of Mr. Arthur Wallis's Paper on the Flora of Chelmsford, was read. (See p. 37.) Specimens of *Leucojum Æstivum*, from the marshes by the river side, between Woolwich and Greenwich, Kent, were exhibited and distributed by Mr. D. Cooper, who described the locality as being at the bend of the river, directly facing the Plough Tavern, Blackwall. The continuation and conclusion of Mr. Manley Hopkins's paper on Vegetable Fermentation, occupied the remaining portion of the first evening, and the entire of the meeting held July 6th.

Digitized by Google

AUGUST 3RD.

JOHN REYNOLDS, ESQ., Treasurer, in the Chair.

Mr. Dennes read a translation of the report made to the Academy of Sciences at Paris, by M. Mirbel, Dutrochet, and St. Hilaire, on the structure and development of the generative organs of a species of *Marsilea*, found by M. Esprit Fabre, near Agde. From the Annales des Sciences Naturelles.

SEPTEMBER 7TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

The following communication, accompanied with drawings, was read from Mr. R. H. Schomburgk, dated New Amsterdam, River Berbice, May 11th, 1837, on what he considered to be a new species of *Nymphæa*, but which the President had compared with the specimens of *Nymphæaceæ* in the Herbarium of the British Museum, and was satisfied that it would form a new group intermediate between *Nymphæa* and *Euryale*; and therefore proposed that Mr. Schomburgk's intention of naming it after her present Majesty VICTORIA should be carried into execution, her Majesty having previously granted her permission. It was therefore named VICTORIA REGINA, and the Society has adopted this plant as its emblem.* Mr. S. describes it thus:—

VICTORIA REGINA.—*Schomburgk.*

N. foliis orbiculatis integerrimis subtus coloratis, supra reticulato areolatis, utrinque glabro; nervis venisque subtus prominentis, aculeatis. Stigmate multi-radiato. Petiolis teretibus aculeatis. *Guiana ad fluv. Berbicem.*

* See the Plate facing the Title page.

Digitized by Google

THE character of grandeur so peculiar to the productions of a tropical sun and a humid climate is highly developed in the object of the above description. The Holy Cyamus or Pythagorean Bean is said to have been derived from a plant closely related to the Nymphæaceæ, (Nelumbium speciosum,) and not only that it is highly valued in India and China, and cultivated in large ornamental pots in the gardens and houses of the Mandarins, but it has been held in such high estimation that at last it was considered sacred. The description and illustrations which have been transmitted to us of this noble plant, have raised a desire in many a botanist, to see it in its native country. In my rambles through the West Indian Archipelago, I had frequently met the white Water Lily; but the remark of an eminent botanist, that these floating plants were entirely unknown on the continent of South America, did not make me expect to find a representative of that tribe, which, for the superior grandeur of its leaves, the beauty of its flowers, and its fragrance, may be classed amongst the grandest productions of the vegetable world. It was on the 1st of January this year, while contending with the difficulties nature opposed in different forms to our progress up the river Berbice, (in British Guiana) that we arrived at a point where the river expanded and formed a currentless basin. Some object on the southern extremity of this basin attracted my attention. It was impossible to form any idea what it could be, and animating the crew to increase the rate of their paddling, shortly afterwards we were opposite the object which had raised my curiosity. A vegetable wonder! all calamities were forgotten, I felt as a botanist, and felt myself rewarded. A gigantic leaf, from five to six feet in diameter; salver shaped, with a broad rim of light green above, and a vivid crimson below, resting upon the water. Quite in character with the wonderful leaf, was the luxuriant flower, consisting of many hundred petals, passing in alternate tints from pure white to rose and pink. The smooth water was covered with them, and I rowed from one to the other, and observed always something new to admire. The leaf on its surface is of a bright green, in form almost orbiculate, with this exception, opposite its axis, where it is slightly bent in. Its diameter measured from five to six feet; around the whole margin extended a rim about three to five inches high, on the inside light green, like the surface of the leaf, on the outside, like the leaf's lower part, of a bright

Digitized by Google

crimson. The ribs are very prominent, almost an inch high, and radiate from a common centre, and consist of eight principal ones, with a great many others branching off from them. These are crossed again by a raised membrane, or bands at right angles, which gives the whole the appearance of a spider's web, and are beset with prickles; the veins contain air cells like the petiole and flower stem. The divisions of the ribs and bands are visible on the upper surface of the leaf, by which it appears areolated. The young leaf is convolute, and expands but slowly; the prickly stem ascends with the young leaf till it has reached the surface; by the time it is developed, its own weight depresses the stem, and it floats now on the water. The stem of the flower is an inch thick near the calyx, and is studded with sharp elastic prickles, about three quarters of an inch in length. The calyx is four-leaved, each upwards of seven inches in length, and three inches in breadth; at the base they are thick, white inside, reddish brown and prickly outside. The diameter of the calyx is twelve to thirteen inches, on it rests the magnificent flower, which, when fully developed, covers completely the calyx with its hundred petals. When it first opens, it is white, with pink in the middle, which spreads over the whole flower, the more it advances in age, and it is generally found the next day of a pink colour. As if to enhance its beauty, it is sweet-scented. Like others of its tribe it possesses a fleshy disk, and the petals and stamens pass gradually into each other, and many petaloid leaves may be observed which have vestiges of an anther. The petals next to the leaves of the calyx are fleshy, and possess air-cells, which certainly must contribute to the buoyancy of the flower. The seeds of the many-celled fruit are numerous, and imbedded in a spongy substance. We met them hereafter frequently, and the higher we advanced the more gigantic they became. We measured a leaf, which was six feet five inches in diameter, its rim five and a half inches high, and the flower across fifteen inches. The flower is much injured by a beetle, (Trichius, "Spec.?") which destroys completely the inner part of the disk, we have counted sometimes from twenty to thirty in one flower.

Digitized by Google

EXPLANATION OF PLATE 5.

(*Facing Title page.*)

Fig. 1. *fruit*
,, 2. *perfect* } *flower*
,, 3. *drooping* }
,, 4. *flower bud*

PLATE 6.

,, 1. *a vertical section of the flower to show the gradual passage of petals into stamens*
,, 2. *a vertical section of the flower, the petals mostly removed*
,, 3. *a vertical section of the fruit*
,, 4. *a young seed*
,, 5. *a transverse section of the stem*

OCTOBER 5TH.

JOHN REYNOLDS, ESQ., Treasurer, in the Chair.

A Paper, accompanied by a drawing, was read from Mr. R. H. Schomburgk, on a new species of *Loranthus*, which he called *Loranthus Smythii*, in honour of Lady James Carmichael Smyth, a great admirer of Botany.

L. SMYTHII.—*Schomburgk.*

Ramis teretibus 2—3 chotomis; nodosis; foliis subfoliatis vel acinaciformis, patentissimis, coriaceis, 4—5 nerviis; pedunculis axillaribus 2—3 chotomis; bracteis coloratis; coriaceis subternifloris. *Ad fluv. Berbiceum.*

THIS Loranthus distinguishes itself from all those I have hitherto seen, not only by its elegance, but likewise by the vivacity of the colour of its flowers and floral leaves, and the aromatic fragrance of the former. Like most of its tribe, it is a parasite, and it roots so firmly in the wood of other trees, that only the different form of the leaves, and the two and three chotomous growth of its branches, removes the mistake if it should be found without flowers.

The branches are terete, knotted at the place of their division, and are of a greyish colour; the branchlets are green,

Digitized by Google

likewise knotted, and towards their end of a lake colour; the coriaceous leaves are opposite, entire, four to five nerved, sometimes foliate, while others are rather acinaciform. The inflorescence forms a Cyme, the peduncles are axillary, and divide repeatedly in two or three, each being provided with a bractea partly accompanying two or three flowers. The bractea is of a vermilion colour, and surrounds the sessile flowers; the calyx is slightly densated, and of a similar colour; the corolla is tubular, of a bright yellow, tinged with orange and red; it has six petals divided to the base, and connected so closely with the stamens that the latter appear to arise from the corolla, while their rudiments may be traced to the base of the petal, where they are inserted in the ovary. After the flower bud has expanded, the segments roll backwards to the point where the stamen becomes free; on each side of the stamen (where it becomes free from the corolla) rises a small prominence from the segment of the corolla. By its convolution the tubular corolla resembles the capital of a column. The stamens are equal in number to the petals, the style is simple, the stigma rounded, the anther incumbent, two-lobed, each lobe with a longitudinal line of dehiscence. When the filament is attached to the anther, the first as well as the latter is villose. The fruit is a berry, one-celled, seed solitary, testa membraneous.

Mr. Joseph Freeman then communicated the results of his excursions in the vicinity of *Stratford, Leytonstone, Wanstead, and Snaresbrook, Essex.* In the immediate vicinity of Stratford, Mr. Freeman found

51 Natural Orders
133 Genera
183 Species

On account of the proximity of Stratford to London, the following localities for the rarer species might not be unacceptable to the Metropolitan Botanist.

Ranunculus arvensis .	Fields near Temple Mills.
Nuphar lutea . . .	River Lea, near do.
Corydalis lutea . . .	Found some years since on a wall at Upton. The wall having been recently repaired, the plant has disappeared.

Digitized by Google

Cardamine amara . .	By the river side, on the long wall near the Abbey Mill.
Malva moschata . .	Cann Hall Lane.
Saponaria officinalis .	Forest Lane, (believed to be its only habitat.)
Sedum Telephium .	On a bank by the road side, leading from Stratford to Leyton.
Cerasus Padus . . .	Forming a hedge in a field on the right hand of the lane leading from Stratford to Temple Mills.
Inula Helenium . . .	Plaistow Marshes.
Hottonia palustris . .	In a ditch by the side of the short wall, Stratford, a very little distance from the high road.
Butomus umbellatus .	Plaistow Marshes. In a ditch not far from the Prince Regent.

With respect to the number found spontaneously growing in the vicinity of Leytonstone, Wanstead, and Snaresbrook, Mr. Freeman had observed of

Natural Orders . .	57
Genera	138
Species	191

Mr. Wallis communicated a continuation of his Paper on the Flora of Chelmsford, as inserted p. 39.

Dr. Bossey exhibited a series of grasses including *Alopecurus pratensis, Lolium perenne, Holcus lanatus,* &c., which were affected with *Uredo segetum.*

Mr. W. M. Chatterley then read some extracts from M. A. Decandolle's Memoir on Alimentary Plants, accompanied by a chart of the world, in which were laid down the boundaries, north and south, as mentioned by that author.

The Curator stated, that he had in the course of the season, much conversation with farmers and others on the Essex side of the river, and who informed him that since the increased navigation of steam vessels on the Thames, they had found their land considerably improved; which they attributed to the fact of the prevailing winds blowing the smoke, and depositing the *soot* on that side of the river. This subject was fully discussed.

Digitized by Google

NOVEMBER 2ND.

Dr. D. C. Macreight, V.P., F.L.S., in the Chair.

NOVEMBER 16TH.

J. E. Gray, Esq., F.R.S., President, in the Chair.

These two evenings were occupied with Dr. Bossey's Paper on the "Fungi which attack the cereal grain." He spoke principally of the *Uredo segetum* and *U. caries*, the grasses which they affect, and the deleterious effects when taken into the system as food or medicine.

Dr. B. enumerated the following species of grasses on which he had found the *Acinula clavus*, in the neighbourhood of Woolwich, Kent, which were exhibited;

Alopecurus pratensis	Bromus secalinus
. . . agrestis	. . mollis
. . . geniculatus	Arundo Phragmites
Phleum pratense	Hordeum murinum
Holcus lanatus	. . . . pratense
Arrhenatherum avenaceum	Triticum repens
Dactylis glomerata	Secale cereale
Festuca duriuscula	Lolium perenne
. . pratensis	

NOVEMBER 29TH.

J. E. Gray, Esq., F.R.S., President, in the Chair.

Anniversary Meeting.

The Secretary read the Annual Report, of which the following is an extract:—

The Council of the Botanical Society of London, in surrendering their trust into the hands of the members, have great pleasure in announcing the present state of the association, and trusting to the continued support and exertions of numerous members and friends, look with confidence to the future.

Digitized by Google

The number of members, amounting to sixty five, of which the new members elected for the ensuing session far exceeds the expectations of the council, who are at the same time happy to state, that they have received but ten notices of secession of members.

The council refer with pleasure to the list of donations to the Library, Herbarium and Museum, and hope that the several donors, and the others members, will not cease either their favours or their exertions.

The names of the various donors to the Library, are as follows:—Messrs. Gray, Macreight, Reynolds, Charlesworth, J. F. Young, Bossey, MacIntyre, Dennes, Cooper, J. and G. Rich, White, Bell, W. Pamplin, Jun., W. Baxter, Hancock, Mrs. Gawler, &c. &c.

The report of the Curator with respect to the Herbarium is as follows:—The names of the various donors are, R. Leyland, Halifax, Yorkshire; C. Conway, Pontnewydd, Monmouthshire; A. Wallis, Chelmsford, Essex; W. Baxter, Botanic Garden, Oxford; W. Gardiner, Dundee; Dr. Bell Salter, Poole, Dorsetshire; Dr. Ranking, Hastings; Miss Perry, Stroud, near Godalming, Surrey;—and the following, residing in London; Messrs. J. F. Young; D. Cooper; G. E. Dennes; W. M. Chatterley; M. Hopkins; J. and G. Rich; W. H. White; W. A. Lewis; R. Davis; Dr. D. C. Macreight; Mrs. Gawler; Mrs. Dennison, &c.—To these ladies and gentlemen the Society is indebted for several valuable presents of British and Foreign collections of dried plants. The number of British plants received amount to 4819 specimens, including Ferns; 767 species, including 1313 specimens, have been arranged in the Herbarium, according to the system of Decandolle. The remaining 3506 duplicates, including 515 species, will be distributed to those persons who have favoured the Curator with lists of desiderata for that purpose.

The distribution will take place under the direction of the council in the months of December and January every year, when each member will receive such of his desiderata as may be contained among the duplicates in the Herbarium, in proportion to his contributions. Those gentlemen who have not contributed to the Herbarium, receiving their duplicates after the distribution of the contributors has taken place. The council beg also to inform the members, that in order to afford every facility for examining the Herbarium and Library, the Rooms of the Society will be open one hour and a

Digitized by Google

half previous to the ordinary meetings of the Society, when the Curator and Secretary will attend to render any assistance that may be required, and to circulate the books. In addition to the extensive and valuable collection of British plants, the council beg to announce the receipt of a large collection of French plants, supposed to be a portion of the Herbarium of Jean Jacques Rousseau, together with some plants from Mahon Minorca, presented by Mr. G. E. Dennes. Another collection of Foreign plants from America, collected by the Officers of the Hudson's Bay Company, has been presented by Joseph Freeman, Esq. Also specimens of *Lycopodium Circinnatum*, from the President, sent by Dr. Forbes, F.R.S. of Chichester. Specimens of three new British plants have been received, viz., *Claytonia Alsinoides*, from Mr. W. Baxter, of Oxford; also a moss new to Britain, *Cinclidium Stygium*, from Mr. Leyland, of Halifax; and specimens, of which there are many duplicates, of *Spartina Alternifolia*, from Itchin Ferry, Southampton, presented by Dr. Macreight, V. P.

The Society have also received from Mr. R. H. Schomburgk, now travelling in British Guiana, papers accompanied with drawings on the two following interesting plants, viz: *Victoria Regina* and *Loranthus Smythii*. Also donations of seeds from the Cape of Good Hope, presented by M. Schmidt.

The council have also great pleasure in announcing that the Society is much indebted to the following gentlemen for their communications,—Dr. Bossey, Dr. MacIntyre, Messrs. Schomburgk, G. E. Dennes, M. Hopkins, J. Reynolds, H. A. Meeson, A. Lewis, W. M. Chatterley, Joseph Freeman, D. Cooper, A. Irvine, A. Wallis, &c.

The report was unanimously adopted.

The chairman then announced the commencement of the ballot, for the election of officers for the ensuing year, when the following gentlemen were elected:—

John Edward Gray, Esq., F.R.S., *President.*

J. Reynolds, Esq., *Treasurer.* | Daniel Cooper, Esq., *Curator.*

G. E. Dennes, Esq., *Secretary.*

Digitized by Google

Other members of the Council—

Francis Bossey, M.D.	D. C. Macreight, M.D. F.L.S.
Edward Charlesworth, Esq., F.G.S.	Æneas MacIntyre, L.L.D. F.L.S.
W. M. Chatterley, Esq.	W. H. Ranking, M.D.
Joseph Freeman, Esq.	James Rich, Esq.
T. W. Greene, Esq., B.C.L. F.H.S.	W. H. White, Esq.
Charles Johnson, Esq.	

The President then proceeded to appoint two Vice-Presidents, from the Council, and named

Dr. D. C. MACREIGHT, F.L.S., and CHARLES JOHNSON, Esq.

A vote of thanks having been given to the President for his unremitting zeal and attention to the affairs of the Society, and also to the retiring members of the Council, the meeting adjourned.

DECEMBER 7th.

Daniel Cooper, Esq., A.L.S., Curator, in the Chair.

A translation from Sprengel's work on "Cryptogamous Plants," was read from the chairman, "*On the character, affinities, places of growth, economical uses, and geographical distribution of the Mosses.*"

DECEMBER 21st.

John Reynolds, Esq., Treasurer, in the Chair.

This meeting was chiefly occupied with the remaining portion of the Curator's translation of the former paper on the Mosses.

Digitized by Google

1838.

JANUARY 4TH.

DR. FRANCIS BOSSEY, in the Chair.

JANUARY 19TH.

DANIEL COOPER, ESQ., A.L.S., Curator, in the Chair.

These two evenings were occupied with Mr. G. E. Dennes's paper translated from the Annales des Sciences Naturelles for March 1837, "*On the structure and development of the generating organs of a species of Marsilea*" found by M. Esprit Fabre about the environs of Agde.

FEBRUARY 2ND.

W. H. WHITE, ESQ., in the Chair.

Mr. Woods presented the Society with a New Botanical Thermometer; and communicated through the Secretary the following remarks:—

On the Influence of Barometric pressure on Plants, &c.

In presenting the Botanical Society of London with an Improved Botanical Thermometer, I intend, in this short communication, to offer a few remarks on the influence of Barometric pressure on some species of plants, particularly exotics.

The effects of Barometric pressure on the animal and vegetable kingdom are plainly discovered in the instances of quadrupeds of the inferior class, and plants found on mountains, and other elevated situations. The influence of temperature, or the effects of heat, when it exceeds the mean of such localities, is not so influential on the physical growth of plants as the increase or diminution of pressure. This will appear obvious on comparing the size of plants in such situations with those of the same kind in less elevated parts

Digitized by Google

of the earth, where they are subjected to a much greater pressure;—thus the diminution in the size of plants is generally in a nearly uniform ratio with our ascent from the mean level of the globe, and vice versâ.

In a climate like England where the mean of Barometric pressure is, on an average of years, 29,500 inches, but little calculations are made for the effects of pressure, although on many occasions plants are exposed to a greater or lesser degree than at others. Many Botanists, however, consider that as heat is the *prime mover* of vegetable organization, by keeping the Thermometric column at the same height for Myrtles, as marked on the graduated scale, is all that is necessary; when, were they but to observe the effects upon the foliage when the Barometer is at twenty-nine or thirty inches, they would see the necessity of an increase of temperature when the Barometer is very low and vice versâ; unless an easterly or north-easterly wind prevail. From this it will be seen how to preserve plants reared between the tropics (where the Barometer is nearly at the same height;) for these plants are much affected by the fluctuations of the mercury in the tube of the Barometer.

In conclusion, I feel persuaded were Botanists to investigate strictly the laws of atmospherical phenomena, and combine in their researches Meteorology with the science of Botany, their field of observation would become greatly enlarged, and their plants preserved.

FEBRUARY 16TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Mr. W. H. White read a Paper, being a translation of M. Martens "*On Hybridity occurring in Ferns.*"*

FERNS are generally regarded by Botanists as Agamous plants, which cannot be reproduced by seed. The sporules with which the undersides of their leaves are studded, are generally considered analagous to the little bulbs, which are often met with upon several Phanerogamous plants. Viewed in this light, Ferns could not produce hybrids; or rather,

* From the Bulletin of the Royal Academy of Brussels, No. 2, 1837.

Digitized by Google

hybrid Ferns could never be obtained, as we obtain Phænogamous hybrids, having the seeds of one species fecundated by the seminal powder of a neighbouring species.

The following circumstance has, however, recently been verified in one of the greenhouses at the Botanical Garden at Louvain, and does not leave any doubt of the fact, that cases of *Hybridity in Ferns* are to be met with; and, therefore, that this interesting family of vegetables, ought to be ranked among those plants that are endowed with sexual organs; *which justifies the division proposed by the same Botanists, of the Acotyledonous plants of Jussieu into Cryptogamous, properly called Agamous, and ranking them in the following manner among the Mosses, Hepaticæ, Lycopodiæ,* and *Ferns,*— which are considered as having very small, but indistinct sexual organs. However this may be, *it appears there is no occasion to doubt that neighbouring species of Ferns may sometimes produce Hybrid species,* in the same manner as those plants which are furnished with very apparent sexual organs. The following fact is sufficient to dispel every doubt on the subject.

There had been cultivated for some time in one of the greenhouses of the Botanical Garden, at Louvain, two beautiful species of Ferns, the Gymnogramma chrysophylla, (Spr.) and the Gymnogramma calomelanos (Kaulf). *Two very distinct species and different from each other,* especially as one of them has the underside of the leaves or fronds covered with a most beautiful golden yellow powder, and the other has the underside of its fronds furnished with a bright silvery powder, and has besides, its foliage much larger and diversely dentated.

These two species were placed very near to each other, and there was not any other species of Fern in the greenhouse. The head gardener, Denkelaar, wishing to increase the Gymnogramma chrysophylla, on account of the beauty of its foliage, sowed the sporules with great care in several small pots under glasses. These sporules came up very plentifully, but instead of finding Ferns like the mother plant, they furnished, with two or three exceptions, Ferns, the forms of which partook of the characters of both species, in such a manner, as to be intermediate between those of G. chrysophylla and G. calomelanos, and more strongly resembled the latter than the former species, which may with propriety be termed their parent. Thus, instead of having plants whose foliage has a brilliant golden yellow on the underside, as in

Digitized by Google

the Gymnogramma chrysophylla, we had Ferns, the underside of the leaves of which showed a powder of a dull pale yellow, approaching nearer to the silver colour of the G. calomelanos.

The foliage of the new Ferns is as large, or even larger than that of the latter species, and forms a complete contrast to the delicate and elegant foliage of the G. chrysophylla. The form of the fronds also resembles more the fronds of the G. calomelanos than those of their mother plant. Their pinnules instead of being oval-shaped as in the G. chrysophylla are more or less lanceolated, elongated, and pinnatifid, as in the G. calomelanos; in such a manner one may say, as the abstraction made from the yellowish powder from the underside of the fronds, the new hybrid species of the Fern approached nearer to the G. calomelanos than to the G. chrysophylla, although proceeding from the underside of the latter species.

But to form a more correct judgment of the analogy, and the difference between our hybrid species and those from which it has been produced, I have described the distinct characters of the three species in question.

Gymnogramma chrysophylla, Spr. Frondibus bipinnatis, pinnis lanceolatis, pinnulis approximatis sessilibus ovatis incisis striatis, superioribus coadunatis, subtus aureo-farinosis.

Gymnogramma calomelanos, Kaulf. Frondibus bipinnatis, pinnis apice attenuatis, pinnulis lanceolatis acuminatis inciso-serratis, inferioribus pinnatifidis, summis confluentibus, subtus albo-farinosis.

Gymnogramma hybrida, Nobis. Frondibus bipinnatis, pinnis apice attenuatis, pinnulis ovato-lanceolatis inciso-serratis, inferioribus pinnatifidis, summis confluentibus, subtus flavicantibus.

The above remarks led to a long discussion, in which several members expressed their doubts, as to the power of plants so low in the scale producing hybrids. The Secretary then announced that Mr. D. Cooper would at the next meeting commence a course of three Lectures on Botany, one hour previous to the Chair being taken, and continue them every night of meeting, at the same time, until completed, and to which the members and their friends were invited.

Digitized by Google

MARCH 2ND.

JOHN REYNOLDS, ESQ., Treasurer, in the Chair.

Previous to the ordinary business of the evening, Mr. D. Cooper delivered the first lecture on Botany.

Mr. W. H. White read the following Paper on a new species of Epilobium, communicated to him by M. Den-Kalaar.

IN 1830, a collection of seeds was sent from the Botanical Garden of St. Petersburgh, by Dr. Fischer, to the Botanical Garden of Louvain, the greater part of them from Central Russia. Among the number of packages was one of an *Epilobium*, without any specific name, and with the indication *new species*.

The following particulars have been transmitted to me by M. Denkalaar, chief gardener at the Botanical Garden Louvain, relative to the culture of this new species of *Epilobium;* and, as it contains some interesting remarks, I thought I could not make better use of them than by laying them before this Society.

This plant has been cultivated with the greatest care; and from a minute observance of its developments, and researches made into its characters, the cultivators have become convinced that up to the present time, this species has neither been described nor cultivated elsewhere. In order, therefore, to give a faithful exposition of its characters, and to make it better known to the botanical world, the following specific denomination has been given to it, in accordance with the principles of the *angustissimum* and *rosmarinifolium*.

"Our plant has a straight stem, much branched, branches diffused and silky, furnished with alternate leaves, lanceolate, acuminate, and of a silky whiteness. Its flowers, disposed in loose ears, are at considerable distances, solitary, and of a pale rose colour; stigma quadrifid and rather bent; the pod of the same length as the peduncle.

"This description sufficiently indicates that the species in question, belongs to a generic group, designated by Decandolle, in his Prodromus, by the name of *Chamænerion*, consequently to the same series in which is placed the *Epilobium angustissimum*."—Curtis.

Digitized by Google

This last species, confounded by all authors with *Epilobium rosmarinifolium*, Haenke, (not Pursch,) until the publication of the Flora of Reichenbach, is in fact very different, as a long series of observations has proved, so that the above-named publication has become comparatively useless by the publication of the Flora Excursoria.

However this may be, I take the liberty of stating that Reichenbach has not shown the essential differences between these two species of plants.

The one, in fact the *Epilobium angustissimum*, so beautifully figured in Curtis's Bot. Mag., Pl. 76, has its ascendant stem diffuse, branched, reddish, as well as its branches; its leaves linear-lanceolate, obtuse, very smooth, marked with glandular serratures; the flowers loose, solitary upon their footstalks, and flesh-coloured; stigma quadrified and bent; the pod twice as long as the footstalk. It flowers long before the following, and grows spontaneously in Batavia, Ireland, and Scotland.

The other, the *Epilobium rosmarinifolium*, Haenke, is a plant from Bohemia and the Tyrol, and has, on the contrary, an erect stem, diffuse, very much branched; branches spread; leaves lanceolate and acuminate, nearly entire, very slightly pubescent; a long ear, flowers more compact and of a puce colour; the stigma is of the same length as the footstalk, but the pod is four times that length.

In comparing the characters of the *Epilobium angustissimum* and *rosmarinifolium* with those of the *Epilobium* now described, the result is that the latter ought accordingly to be placed as intermediate between the other two, or, at least, as allied to both species. I propose to name it *canescens*, which will give a suitable idea of its habit. In recapitulating the characteristic traits of the three above-mentioned species, I think their mutual affinities and their diagnostic characters will be fully determined as follows:—

1. *Epilobium canescens*, nob. Foliis lanceolatis, acuminatis, integerrimis; ramisque sericeo canescentibus; siliquâ pedunculi longitudine.

2. *Epilobium angustissimum*, Curtis. Foliis lanceolato-linearibus, obtusis, glanduloso serratis; ramisque glaberrimis, siliquâ pedunculo duplo longiori.

3. *Epilobium rosmarinifolium*, Haenke. Foliis lanceolatis, acuminatis, subintegerrimis, ramisque puberulis; siliquâ pedunculo quadruplo longiori.

I will now beg leave to remark with respect to the *Epi-*

Digitized by Google

lobium angustissimum of Curt., that, that species furnishes a variety with leaves still more narrow and stem feeble, which has been designated by the name of *Epilobium Dodonæi* by Allioni, of *Epilobium Lobelli* by Villars, of *E. Halleri* by Retz; and in later periods by *E. angustissimum, E. alpinum* by Sering.

And with respect to the *E. rosmarinifolium*, Haenke, I beg leave to remark that it is a species totally distinct from his homonym, the *E. rosmarinifolium*, Pursch. This last is in fact a North American plant, discovered in 1810 in the environs of Philadelphia, and since by Bigelow, who calls it *E. lineare;* some few years still later in a hundred places southwest of that city, in the territory of Boston. Nuttall has found it, and has given it the name of *E. squamatum.*

MARCH 16TH.

J. E. GRAY, ESQ., F.R.S., President in the Chair.

Previous to the meeting, Mr. D. Cooper delivered his second lecture on Botany. After which the following remarks were read from J. Riley, Esq., of Nottingham, in a letter communicated to the Secretary:—

I remark in the Literary Gazette of 24th February, that a Paper was read at the meeting of the Society "*On Hybridity in Ferns,*" communicated by M. Martens of the Royal Academy, Brussels. He states as a "verified fact" that a Hybrid Fern has been raised at the Botanical Gardens, Louvain, so as to leave "no doubt" on the subject,—and draws his conclusion that therefore Ferns ought to be classed amongst those plants which are endowed with sexual organs—and he states hybrids to be caused by the "seeds" of one species being fecundated by the "active powder" of a neighbouring species. The whole of these conclusions I do "doubt," and I hope to state to you in a rather clearer light the true state of the matter.

I think your Society will scarcely allow that "seeds" when arrived at maturity, can be fecundated, or that the "powder" on the under surface of the fronds of the Gymno-

Digitized by Google

grammæ has any "activity;" for that purpose I will first set right the two species of Ferns which are *both* of the arrangement of Kaulfuss, not Sprengel.

Stehlin, Hill, Maratti, Gleichen, Bernhardi, have each stated their discoveries of the anthers of Ferns, but all failed in establishing its truth, and their several theories have in the more advanced state of microscopic researches become obsolete.

You are aware the sori of the genus Gymnogramma have no indusium or cover, and until the contraction of their elastic ring causes the capsules to burst, the seeds (or sporules more correctly speaking) are closely enclosed from outward contact. The seeds thus only become visible when arrived at maturity, and surely no one can imagine that the perfect seed of another plant placed beside them could produce in either one or the other, a hybrid plant. That a third Fern grew in the pot in which the sporules had been sown, I have no doubt, and to those at all conversant with such Botanical pursuits, it will not appear surprising, for I have frequently found Ferns, not only of another species, but of another genus spring up in the place of those I wished to grow.

Having for a length of time been engaged in growing Ferns from seed, as the only way (except by importation) of obtaining many species new to this country, I send you specimens of three species of Gymnogramma, all raised by me from seed off fronds of their respective sorts, viz, Gymnogramma chrysophylla and Gymnogramma calomelanos of Kaulfus, and Gymnogramma sulphurea of Desv. The latter one I consider the species, supposed by M. Martens to be his "Hybrid," as he probably was previously unacquainted with it. It partakes, as he describes, more of the nature of G. calomelanos than of G. chrysophylla, but is a most distinct species from either.

By close examination of the capsules and sori of Ferns in their different stages of growth, and from the general belief also that generating organs in Ferns have never by the most minute inspection been discovered, I am clearly of opinion M. Martens has been deceived in his "fact," and that it is much more easily to be accounted for by any person who has paid any attention to the very numerous and extremely minute particles of Fern seed, than in the loose and unscientific manner described by M. M.

I should scarcely have thought it necessary to give this contradictory opinion to M. M., had not the statement ap-

Digitized by Google

peared in the columns of the Literary Gazette, and that emanating from so scientific a Society as the one you are connected with, might give the opinion of "Hybridity in Ferns" a weight I am persuaded it does not deserve.

Mr. Riley forwarded to the Society specimens of *Gymnogramma calomelanos, G. chrysophylla, and G. sulphurea,* for comparison.

Mr. Cooper exhibited and explained M. Dutrochet's *Endosmometer.*

APRIL 6TH.

J. E. GRAY, Esq., F.R.S., President, in the Chair.

Previous to the meeting Mr. D. Cooper delivered the third and concluding lecture on Botany.

The following Paper was read "*On the Ant Tree of Guiana,*" (Triplaris Americana). By ROBERT SCHOMBURGK, Esq.

TRIPLARIS, Linn.

Class IX. Ord. II. Ord. Nat. POLYGONEÆ, Juss.

Flores dioici. Calyx basi tubulosus, pilosus. *Flores Masc.* Calyx limbo 6-partitus. Corolla 0. Stamina 9. *Flores Fem.* Calyx 3-partitus. Corolla 3-petala. Ovarium 3-quetrum. Styli tres. Akenium 3-quetrum, calyce aucto tectum.

T. Americana, foliis alternis, integerrimis, oblongis, acutis, nervosis; stipulis lanceolatis laceris, spicis terminalibus axillaribusque brachiatis.

Triplaris Americana, *Linn. Sp. Pl.* p. 130. *Aubl. Guian.* ii. p. 915. t. 347.—T. Pyramidalis, *Jacq. Amer.* 13. t. 173. f. 5.

A TREE from fifty to sixty feet in height; its trunk smooth, of a greyish colour; the branches erect, frequently in the form of a pyramid; leaves entire, oblong and narrow, from nine to twelve inches long, of a dark green colour; petiole dilated at the base, somewhat amplexicaule, with ochreate stipulæ, and marks at the opposite direction, as of fallen-off pe-

Digitized by Google

tioles; flowers unisexual. *Males:* calyx hairy, tubular, surrounded by a laciniated bractea, six-parted; corolla absent; stamens nine, divided in three parcels of different sizes, the large ones opposite the segments of the calyx, filaments somewhat crooked; anthers ovate, two-celled, dehiscing lengthwise. *Females:* calyx provided with the bractea, three-parted; petals three, lanceolate; ovarium superior; styles or stigmas three; akenia triangular, protected by the calyx; seed farinaceous.

Dr. Lindley, in his Natural System of Botany, in speaking of the geographical distribution of *Polygoneæ*, observes, "There are few parts of the world that do not acknowledge the presence of plants of this order. In Europe, Africa, North America, and Asia, they fill the ditches, hedges, and waste grounds, in the form of Docks and Persicarias: the fields, mountains, and heaths, as Sorrels and training and twining Polygonums; in South America and the West Indies they take the form of Coccolabas or sea-side grapes; in the Levant of Rhubarbs; and even in the desolate regions of the North Pole they are found in the shape of Oxyria."

The object of my description adds another instance to illustrate these remarks; the *Triplaris*, which pronounces, in its habits of growth, leaves, stipulæ, its triangular nut protected by the calyx, the farinaceous albumen, &c. its relationship to that tribe, extends from Columbia to the verge of Brazil's western boundary. The sandy banks of the inland rivers of Guiana are peopled with them; and when shrubs, stunted in growth by the poverty of the soil, scarcely reach the height of five or six feet, the *Triplaris* overtops them forty or fifty feet. The trunk is slender and grows up straight, and its erect branches form a pyramid. As already observed, it is unisexual, and the flowers of both sexes are insignificant: those of the male last only for a few days, when they dry up; this is likewise the case with the petals of the females: the segments of the calyx however continue to grow, changing in their growth from green to white and vermilion, and become so attenuated that the branched nerves are easily perceptible. In that state they are three times as large as the fruit, which is still protected by the tube of the calyx, and the whole might in appearance be resembled to a shuttlecock. The risps are dense, and the tree presents now a most elegant appearance. One unacquainted with the contrary, would consider the tree covered with white blossoms, tinged with red, among which the dark green leaves have only occasion-

Digitized by Google

ally room to make themselves visible. The uncautious botanist, who, allured by the deceptive appearance, should approach the tree to pluck the blossoms, would bitterly rue his attempt. The trunk and branches of the tree are hollow, like those of the trumpet tree (*Cecropia*), and provided between space and space with partitions, which answer to the position of the leaves on the outside.

These hollows are inhabited by a light brownish ant, about two or three tenths of an inch long, which inflicts the most painful bites. Its antennæ are placed near the middle of the anterior portion of the head; mandibles triangular; peduncle of the abdomen with two rings; the anus hairy and provided with a sting or piercer (*Myrmica*, Latr., nova species). They fall upon their prey with the greatest virulence, and insert their mandibles almost instantly, as soon as they come in contact with any soft substance, emitting a whitish fluid; their bite causes swelling and itching for several days. If they find themselves captured, they attack and kill one another like the scorpions.

The Arawak Indians call the tree Jacuna, and the ant Jacuna sae; the Warrows, Epouahari, the literal translation being Ant tree; the Caribis, Itassi; the colonists, from its growth, "long John."

The presence of the scarious stipulæ, in the form of an ochrea, is sufficient to determine the natural order to which *Triplaris* belongs; other evidences, namely, the formation of its leaves, its organs of fructification, and particularly the erect ovulum and the superior radicle, put its relationship to *Polygoneæ* beyond doubt. It resembles strikingly the *Coccoloba* in the form of its petiole, and the manner in which it is attached to the stem; we have in *Coccoloba* a similar mark opposite the petiole, and those asperities which are to be found below the latter organ are likewise observable in *Triplaris*. In *Coccoloba* the calyx swells and forms a juicy berry, in *Triplaris* it becomes three times as large as the nut. In its hollow trunk and branches, and the septums of the latter; in the division of the sexes, it resembles *Cecropia;* but to these affinities in appearance but little importance can be attached.

Triplaris has received hitherto a very meagre description. Jacquin gives the representation of its fruit, and Aublet a branch; it is however evident that the flowers of the male were described from those of the female flower: the bractea, present in both, has been completely passed over; the calyx

Digitized by Google

of the male is stated to be three-parted, while it is six-parted; and the pubescence, which is present in the calyx of both sexes, has been also omitted; the bractea is likewise covered with hair.

EXPLANATION OF PLATE 2.

Fig. 1. *Female Flowers of Triplaris Americana.*
2. *Male Flowers.*
3. *Male Flower magnified.*
4. *Calyx cut open to show the position of the Stamens.*
5. *Anther.*
6. *Female Flower.*
7. *ditto cut open and greatly magnified.*
8. *Seed vessel with enlarged Calyx.*
9. *Nut cut transversely.*

River Quitaro, Lat. 2° 50′ N., November 1837.

A specimen of the *leaf* of *Victoria Regina* was exhibited, received from Mr. Schomburgk, which the Council deemed advisable to deposit in the Herbarium of the British Museum.

APRIL 20TH.

DR. ÆNEAS MACINTYRE, F.L.S., in the Chair.

The following gentlemen were elected Foreign members:

Charles A. Agardh, *Lund.*
Dr. C. L. Blume.
Adolphe Brogniart, *Paris.*
August P. De Candolle, *Geneva.*
Dr. G. F. De Waldheim, *Moscow.*
Benjamin De Lessert, *Paris.*
Dr. Elias Fries, *Lund.*
James W. Hornemann, *Copenhagen.*
Alex. Baron de Humboldt, *Berlin.*
Adrian de Jussieu, *Paris.*
Charles G. Kunth, *Berlin.*
Dr. H. F. Link, *Berlin.*
Dr. C. F. De Martius, *Munich.*
C. F. B. Mirbel, *Paris.*
Dr. C. G. Nees Von Esenbeck, *Breslau.*
C. G. C. Reinwardt, *Leyden.*
Dr. G. Wahlenberg, *Upsal.*
Don. M. La Gasca, *Madrid.*
Baron Von Ludwig, *Cape of Good Hope.*
R. H. Schomburgk, *British Guiana.*

Digitized by Google

The Secretary then read the following Paper from Mr. A. Wallis, on the Genus *Myosotis*:—

There are but few of our British genera, that have received so many additions of late years, as that of the genus *Myosotis*. Linnæus, in his great work on Natural History, has described but two species, and includes under them one or two varieties, which have since been established as species. The two individuals which he has admitted into his work, are *M. palustris* and *M. arvensis*, these then may be taken as types of the genus,—the other species possessing a claim to that name only, from some slight variations in their respective characters. I propose, in this paper, to confine my remarks to three of the newly-admitted species, viz. *M. sylvatica*, *M. versicolor*, & *M. collina*, and I do so with some degree of reluctance, when I consider that they have been pronounced as specifically distinct, by some of the ablest and most experienced Botanists in the land. But as objects in nature are at all times open to enquiry, I have deemed it not altogether presumptuous to state my individual views on this subject, conceiving that the observations of the many, will more effectually tend to elicit truth, than when made only by one or two.

If then, we take *M. arvensis* as a type of the genus, we are led to consider what are the distinctive characters which separate the before-mentioned species from it. The *M. arvensis* we most usually find in corn-fields, or other highly cultivated land, where it sometimes reaches a considerable height. Now, the *M. sylvatica* is mostly found in shady places, where it assumes a stouter form than *arvensis*; the bristles of the stem are shorter, and the leaves will generally be found larger than those of *M. arvensis*. But would not the difference of soil and situation account for the more luxuriant growth of the one than of the other? There is another distinction, also, for which neither soil nor locality would account; it is that the calyx of *M. sylvatica*, is more deeply cleft then *arvensis*, and the tube of the corolla is longer in the former than in the latter; but I have been disposed to doubt, whether these are sufficient to justify a specific distinction, and the more particularly so, when we recollect that many plants are subject to slight variations in their structural minutiæ. Again, the *M. collina* is established as a species by modern Botanists; and, indeed, on comparing it at first sight with *M. versicolor*, one would scarcely presume

Digitized by Google

to doubt the accuracy of the distinction. But if we examine them closely, both as regards their comparative structure, also in relation to their places of growth, the first apparent difference will considerably vanish. The situation in which I have invariably found *M. collina*, is on high and arid banks, formed of a light shingle; and as this soil is less calculated to produce a radiation of heat than many others, the plant is generally forced into bloom by April,—much earlier than the rest of the genus. As the summer advances, however, the moisture of the bank becomes absorbed, and the plant speedily dies. This individual, when growing in these situations, seldom attains a greater height than two inches; its general appearance is very compact, and the leaves densely crowded. Its beautifully minute and modest flowers, form a most interesting object in the early part of the spring; they will sometimes be found to grow so abundantly, that the bank is covered with their bright cerulean petals; and the somewhat broad and thickly matted leaves with which the ground is covered, tend to constitute a *tout ensemble* which every true lover of nature must admire. This is, indeed, one of those plants which may be said to be "*simplex munditiis*," as its minuteness and symmetry, (if I may use the term) give it the elegance for which it is noted.

As respects the *M. versicolor*, it must be admitted that its habit varies considerably from the last-named species; as instead of the stunted and bushy growth which characterises *M. collina*, it assumes an erect form, and the pedicels have more of the divergence which is to be seen in the former species. I have most usually found this plant on moist clayey banks; sometimes attaining a height of six or eight inches, with numerous small branches issuing from the root and stem. The leaves, also, are proportionably narrower than those of *M. collina*, a consequence, I presume, arising from its more elongated form. In other respects, I can observe no striking difference between the two; in both we find the uncinated bristles mentioned by Borrer; and both will be found to accord, as regards the smoothness of the fruit, and the concave limb of the corolla. Again, a marked distinction has been assigned to *M. versicolor*, from its uppermost flowers being of a light buff colour, while those which were more fully developed were blue; this would certainly seem rather conclusive; but, having minutely noticed the genus during the summer of 1837, I found it was not uncommon for *M. collina* to have its uppermost florets tinged

Digitized by Google

the same hue as those of its nearest ally (*M. versicolor*). This fact appears not to have been before observed.

Such, then, being the uniformity of character, which appears to me to exist in the individuals in question, I am led to consider that the apparent distinction between them, arises solely from their respective peculiarities of soil and situation. The one puts forth its early blossoms in a soil which is loose and arid, and thus affording no sustenance for a more perfect development, while the other is found in deep and cohesive loam, capable of retaining moisture throughout the summer, and from which a greater portion of nourishment can be obtained.

Admitting, then, that a difference of *soil* operates so powerfully in producing such varied, and perhaps permanent distinctions of character, it will become a subject worthy of attention, how this peculiar operation takes place; and whether, by close observation on the SOIL, as well as locality, we may not be able to establish geological laws.

MAY 4TH.

W. H. WHITE, ESQ., in the Chair.

A communication was read from the Chairman, being a translation of a paper read before the Academy at Brussels, by Professor Kickx, entitled "*A note on the Hybridity of Ferns.*"

M. Kickx presented the following observations to the Royal Academy at Brussels, at their sitting in February 1837, and which is published in the Bulletin of the Royal Academy for March.

"I have a few observations to add to those which M. Martens has laid before you, on a case of Hybridity in Ferns. My observations are as follows, viz:—

"1st. That I have witnessed the spontaneous crossings of the *Gymnogramma chrysophylla* and *calomelanos* cultivated in our greenhouse.

"2nd. That the seeds of the *Hybrida,* collected by M.

Digitized by Google

Denkalaar, gardener to the University of Gand, offers a solution of a doubly interesting question: First, to decide whether the produce of the Hybrid will be fruitful, and Secondly, to show, in such case, towards which of the two types, maternal or paternal, it will have a tendency to return. We know, indeed, that the tendency to become like the seeds of the maternal type is, in general the most frequent; although, on the other hand, one may, by repeated artificial fecundations, bring back again certain Hybrids indifferently to either.

"3rdly. That I have attested the same kinds of Hybridation between two ferns of our own country: the *Asplenium-Ruta-muraria*, and the *Asplenium Germanicum*, running into each other in the year 1835, upon the walls of the cemetery at Scharbeck.

"The Hybrid produce tending to the *Asplenium-ruta-muraria*, by the two inferior pairs of winged leaflets, and to the *Asplenium Germanicum* by the form of the pinnules of those leaflets, which, instead of being (as in the *A. ruta-muraria*) oblong rhomboidal, obtuse, and irregularly denticulated, were, on the contrary, contracted at their base, and simply dentated at the summit.

"These remarks are given to support those of Mr. Martens, which I had intended to lay before the Academy in a more detailed form, if I had not been preceded by our honourable colleague."

The reading of this communication confirming the views entertained by M. Martens, led to a long and interesting discussion, in which several Members expressed their doubts as to the Hybridity above mentioned.

JUNE 1st.

J. E. Gray, Esq., F.R.S., President, in the Chair.

The usual business of the evening having been dismissed, the Secretary proceeded to read a letter of thanks from the British Museum, for the specimen of the *leaf* of *Victoria Regina* which the Council thought advisable to deposit in the Botanical department of that institution, and which had been transmitted to the Society by Mr. R. Schomburgk, now travelling in British Guiana.

Digitized by Google

Mr. Dennes then read a Memoir on *Polygonum Owenii*, which on account of its interest he had translated from the "Annales des Sciences Naturelles." The Secretary also communicated "*Notes on Lythrum Salicaria.*" In this communication Mr. Dennes alluded to the varieties of this plant mentioned by Withering; and stated that he had observed specimens collected near the metropolis, having the leaves *alternate, opposite, and three in a whorl.* The plant is usually described as having *opposite* leaves, at least by Hooker. Mr. D. proposed that they should be considered as distinct varieties, and named them as follows:—

Lythrum Salicaria.

1. *α alternifolia.*
2. *β verticillata.*

Mr. Daniel Cooper exhibited and offered for distribution to the members several of the rarer plants found about Reigate, Surrey, which he had that day expressly collected for the purpose: and stated that it was the intention of several of the members to collect in a similar way the rarer plants of the vicinity of London, and exhibit them at the monthly nights of meeting throughout the summer. Mr. C. called the attention of the members to specimens of *Paris Quadrifolia*, of which there were plants on the table having from three to seven leaves, but in no instance had he observed more than five portions of the calyx, and not, as recorded by some authors, a division of the calyx for each leaf found upon the stem. Mr. Gray noticed a peculiarity in the flower of *Adoxa Moschatellina*, and expressed his approbation of the plan of procuring living specimens of the rarer species for distribution at the summer monthly meetings, as it would enable many of the members to examine and make such observations upon the plants as they might think necessary, and who might be prevented from collecting them at the proper period. Among Mr. C.'s collection were specimens of the early Orchideous plants from the Chalk range of Surrey Hills about Reigate, comprising *Ophrys apifera, O. muscifera, Orchis ustulata, Platanthera bifolia, Listera ovata, Aceras anthropophora, &c.* Specimens of *Leucojum Æstivum* were also exhibited by the Secretary, which were obtained from the old station in Greenwich marshes, opposite Blackwall.

Digitized by Google

JULY 6TH.

J. E. GRAY, Esq., F.R.S., President, in the Chair.

The following Paper (accompanied by Drawings) was read "*On Bertholletia excelsa,*" by R. H. SCHOMBURGK, Esq.

BERTHOLLETIA EXCELSA.—Humb. and Bonpl. Pl. Æq. Cl. xiii. ORD. i. ORD. NAT. LECYTHIDEÆ.—Richard.

Fructus Globosus, drupaceus, lævissimus, quadrilocularis, non dehiscens; loculis 6—8, spermis; dissepimentis in fructu maturo obliteratis; columella centrali libera, sarcocarpio crasso; endocarpio duro, externe sulcis ramosis notato, evalvi. Semina subreniforma-triquetra, rugosissima, columellæ centrali affixa.

Integumentum exterius lignosum, interius membranaseum, utrumque e laminis duabus compositum. Embryo caruosus, partibus, omnibus invicem conferruminatis.

Arbor altissima; ramis alternis; junioribus apice foliosis. Folia alterna, magna, oblonga, intgerrima, non punctata, coricacea. Stipulæ nullæ Flores Flavi? Fructus magni.

HUMB. et BONPL.

Calix superus bilobus deciduus petala sex calyci inserta, subæqualia, discus annularis intus staminibus creberis obsitus, hinc diliatatus in ligulam membranaceum papilloso lamellatam. Ovarium inferum sub 4 loculare; ovulis axi centrali affixis, Stylus 1, Stigma obtusum. Mihi.

A tree of the first size, the trunk is straight, the bark deeply furrowed, and of a dark grey colour; it reaches the height of ninety to one hundred feet, before it divides into spreading alternate branches; the leaves are petiolated eight to ten inches long, alternate, oblong, coriaceous, somewhat wavy, the margin obsolete repand, without pellucid dots; petiole semiterate, canaliculate, amplexicaule, without stipulæ; from petiole to petiole of the alternate leaves extends a coloured streak; flowers in racemes, terminal; calyx supe-

Digitized by Google

rior, two-leaved, the apex of the limb three-parted; corolla consisting of six petals somewhat revolute, the petals slightly cohering at the base, imbricate in æstivation, stamens indefinite, thickly inserted on a petaloid body, which, at its base is elongated, ends in a hood, and covers these organs. Filaments curved, anther two-celled, dehiscence lengthways; ovarium inferior, obsolete, four-celled; ovula attached to a central axis; stigma simple obtuse. Fruit globose, fifteen to eighteen inches in circumference. The epicarpium is rugose; the mesocarpium which is fleshy in its unripe state, changes into fibres, resembling those of the cocoa-nut, (Mesoc. fungoso-fibrosum); the endocarpium or putamen, is slightly umbonate. The locuments which the green fruit possess are only thin membranous bodies, searcely to be recognised when it has come to maturity; the nuts are placed around the quadrangular spumaphorum in four rows one over the other; there are generally from twenty to twenty-four nuts, seldom more, — they are three-cornered, rugose of somewhat reniform shape; the kernel is sweet and does not possess the bitter aftertaste of the other Lecythideæ. At maturity the nut falls to the ground, and the spermaphorum commences to dry up; the putamen is perforated at the top, and when the moisture causes the seeds to germinate, they burst the shell. Many are opened by monkeys, peccaries, and other animals, which appear to be very fond of them.

The bark is easily separable like all Lecythideae, and the liber is beaten by the Indians into a mass, which they use in lieu of tinder. They make of the shell of the nut arm-rings, and use it in various other ways; the wood is bitter, soft, and inside generally hollow. This noble tree does not promise, therefore, to become useful for architecture; the nuts are, however, delicious, chiefly when they have come to full maturity, and are a few weeks from the tree; for my part I do not like them so well when quite fresh. I have met with the tree from 3° N. Lat. to the Equator, and it appears to thrive best in rich mountain valleys, and at the declivity of hills. I observed, however, none at the height of three to four thousand feet; they blossom in January, and the fruit comes to maturity in five to six months. The Caribees call the fruit and tree Batouka, the Wapeshanas Minja, and the Macousis Impiema.

Digitized by Google

EXPLANATION OF PLATES 3 AND 4.

Plate 3. *Flowering branch of Bertholletia excelsa.*

Plate 4. *Fig.* 1. *Bud.*
2. *Perfect flower.*
3. *ditto cut longitudinally.*
4. *The Petaloid unilateral body, on which the stamens are fixed.*
5. *Calyx with Style.*
6. *Stamens* (a) *front view.*
(b) *side view.*
7. *Ovarium after the petals and Calyx have fallen off.*
8. *Ovarium cut longitudinally.*
9. *Fruit.*
10. *Fruit cut vertically open, to show the position of the seeds.*
11. *Fruit; the seeds removed to show the rudiments of Locuments.*
12. *Seed.*
13. *Seed cut longitudinally.*

Curassawka lower Prupununy, *Feb.* 22*nd*, 1838.

AUGUST 3RD.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Specimens of *Polypogon Monspeliensis*, *Poa distans*, *P. procumbens*, *Setaria viridis*, &c., were exhibited by Dr. Bossey, collected near Woolwich. Mr. J. Anderson also exhibited numerous living specimens of *Utricularia vulgaris* and *Myriophyllum verticillatum*, obtained from the old locality in the ditch around Kew Gardens, near Richmond, Surrey, which were distributed.

A communication was then read by Mr. D. Cooper, being some notes on a large variety of *Ranunculus Flammula*, which he had found near Reigate, Surrey, and which approached near to *R. Lingua* as regards its habit; the size of the flower however being a sufficient character to consider it as the former species, although the whole character of the her-

Digitized by Google

bage resembled much the latter species; the stem varying from ten to nineteen inches in height, and the leaves of considerable size. Mr. C. also observed that the variety of *R. Flammula* β *reptans* Lightfoot, was exceedingly plentiful on Hampstead and other Heaths near London.

The following Paper was also read, being "*Details of the First Excursion made this Summer by the Members of the Botanical Society of London: with Observations on varieties of Plants.*" By DANIEL COOPER, Esq., A.L.S., Curator to the Society.

THE first excursion made by the members of this Society was to a spot situated about twenty-five miles from London, called Woking. This spot was chosen on account of the easy access by the London and Southampton railway. Upon alighting at the station at Woking Common, Surrey, and proceeding to the right of the carriage-road leading to Guildford, on to the common, great abundance of *Ulex nanus*, *Carex Œderi*, *Aira caryophyllea* and *Aira præcox* were observed. One of the party discovered a single specimen of *Teesdalia nudicaulis*, which appeared to be very scarce in this locality, as no other specimen was noticed by any other individual.

Passing beneath the archway of the railroad, (the railroad dividing the common into two parts,) and turning a short distance to the left, on the borders of small water-courses *Lycopodium clavatum* and *Lyc. Selago* are to be sparingly found; the latter species being exceedingly unfrequent in the neighbourhood of London, never having before met with it. It would be as well to state that it was not in fructification, while the other species also, *Lyc. clavatum*, was in excellent condition. I do not see any reason why *Lycopodium inundatum*, which is so plentiful on Wimbledon and other commons around London, should not be found on Woking Common, as the subsoil and situation are very similar.

In the opposite direction, towards the small wooden bridge that crosses the canal, a large sandy plot of ground will be observed, abounding in *Littorella lacustris*, *Hypericum, elodes*, *Anagallis tenella*, *Helosciadium inundatum*, *Carex stellulata*, *C. flava*, *C. Œderi*, *Juncus uliginosus* var, *bulbosus*, *Juncus bufonius*, *Eleocharis palustris* and *cæspitosa*, *Ranunculus Flammula* var. *reptans*, and *Scirpus fluitans*. In dry sandy ground *Blechnum boreale*. On the slopes of the canal

Digitized by Google

near the wooden bridge, *Ervum hirsutum*, and the variety β of *Luzula campestris*, called *Luz. congesta*, (from the flowers being capitate, and the *capituli* being collected into an orbicular sessile head) were noticed. This is the *Luciola congesta* of 'English Botany,' plate 2718. In the canal *Myriophyllum spicatum*, *Ranunculus aquatilis* and *Potamogeton densum* were observed. I have no doubt that in the months of July and August this locality offers an extensive field for the practical botanist.

I must not however leave this locality without noticing a variety of the *Calluna vulgaris* altogether new to me, although mentioned by the older writers to occur occasionally on the heaths and commons in various parts of the country:—I allude to the β *Erica vulgaris* of Gerarde, 1380, and mentioned in Ray's 'Synopsis Stirpium Britannicarum,' p. 471, as follows:—

"Myricæ folio hirsuto, Carolus Bauhin, 485. Myricæ folio tomentosis et incanis foliis Clusii, Johannes Bauhin, 1, 355. Vulgaris hirsutior. Parkinson, 1480. Common rough-leaved heath. Cum priore, a qua certe non puto specie differe (Doodio vero Synopsis ed. 2, Appendix, 345), diversa fuit visa, propterea præcipue quia per totum ericetum *Bagshot* ut et *Redhill*, per 6 aut 8 milliarum iter, vix alia occurat Erica. Eaque Chamæcyparissum canitie æmuletur."

Again, in Ray's 'Catalogus Plantarum Angliæ,' 2nd ed., published in 1677, he further adds:—

"Locis incultis supra Windesoram invenit Clusius. Quin et passim occurrit non minus frequens quam vulgaris glabra, a qua, nostra sententia, non differt specifie, cum ei præter hirsutiem per omnia similis sit: nam glabra quoque alibi elatior est, alibi humilior et nunc dilutiore nunc saturatiore, ac proinde notæ illæ Clusii nihil valent."

Smith, in his 'English Flora,' vol. ii. p. 225, mentions the *Erica vulgaris hirsuta*, Ray's Synopsis; *Erica ciliaris*, Hudson, ed. 1, 144, not of Linnæus.

From these observations of the older botanists it appears that the variety *Calluna vulgaris hirsuta*, or as they term it, *Erica vulgaris hirsuta*, was known to them; and from the description given in the two works of Ray, corresponds exactly to the variety in question. But although this variety is mentioned as far back as the year 1677, yet it has not found a place in any of the recently published Floras. In Macgillevray's edition of Withering's Botany, published in 1833, there is no mention of it. Dr. Macreight, in his 'Manual of British Botany,' published in 1837, does not notice it. Nor does Dr. Lindley, in his 'Synopsis of the British

Digitized by Google

Flora.' Dr. Hooker, however, in his 'British Flora,' 3rd ed., p. 181, mentions var. β, Smith, *as being hairy*, and states that it is the *Erica ciliaris* of Hudson, not of Linnæus. This extreme degree of hairiness is, I think, a sufficient character to warrant its introduction into the other British Floras, as the *Calluna vulgaris*, var. β, *hirsuta*, (Gerarde).

Proceeding by the carriage-road to Guildford, *Littorella lacustris* was also observed on the right, in low marshy spots by the wayside, near to the village of Stoke; together with *Huttonia palustris*, in a ditch by the road. Between Stoke and Merrow, shortly after leaving the former place, on the left is a barren piece of land, upon which was found *Trigonella ornithopodiöides;* and on the right, a large marshy plot of ground, covered to the extent of two acres or more with *Littorella lacustris*, both in and out of the water.

Taking the path to the left, which leads to a large park, through which passes the river Wey, *Cardamine hirsuta*, *Ervum hirsutum*, and *Erv. tetraspermum* were observed.—In the meadows, one specimen of *Orchis Morio* was found, with delicate fawn-coloured flowers, a state in which I had never before observed that plant. There were numerous specimens in the ordinary state, but only one with the fawn-coloured flowers. I cannot find this variety mentioned in any of our British Floras; I therefore conclude that it is exceedingly rare, as it would undoubtedly be recorded, if it were only for its extremely delicate colour. Numbers of the *Orchis mascula* were also found interspersed with it, as was also a white variety of *Ajuga reptans*.

The only remaining plant to be noticed is the *Hyoscyamus niger*, three specimens of which were found nearer to Guildford.

SEPTEMBER 7TH.

CHARLES JOHNSON, ESQ., V. P., in the Chair.

The following Paper was read "*On a principle of fencing, formed according to the laws of Vegetable Physiology*," with observations and remarks by DANIEL COOPER, A.L.S. Curator.

During a short visit at Brentwood, Essex, I was solicited by Mr. Breese, of the Nursery of that place, to inspect a fence he had constructed, which was termed by him a

Digitized by Google

"*Natural living Fence*," an appellation which it well deserved. It consists simply of planting for the purpose trees or shoots of the same species, or species of the same genus, or genera of the same natural family, and causing them to unite by means of the process of "*grafting by approach or inarching*," a process well understood by gardeners and Horticulturists. The fact having been briefly stated, it is necessary in the next place, to enter more fully into an explanation of the plan to be adopted. In the first instance it is requisite to cultivate a portion of land, for the purpose of rearing the shoots intended for forming the fence. Those which I had the opportunity of observing (on the estate of Sir Thomas Neave's, Dagnam Park, Essex, constructed by his gardener and planter Mr. Breese), were formed of ash, but of course any other tree would similarly unite and answer the end required. The faster the tree grows, and produces new wood, the stronger and better the fence necessarily becomes. The shoots or small trees are run up, (as termed by gardeners) and kept trimmed so as to produce stems as straight as possible. These are trained to the height required, depending upon the intended height of the fence. As soon as they have acquired sufficient age they are carefully transplanted, a trench of two feet in width being previously made in the line of the intended fence, it being found necessary to surround the roots with earth of a richer nature than that usually met with, where fences are to be placed, such as the outskirts of woods, plantations, parks, &c. The trench having been made and prepared, the stems are then carefully removed; one set being planted at the required distance, a foot for instance from each other, these we may suppose to slope to the north; the other set, for example, are planted sloping towards the south, at the same distance from each other, so that when the shoots proceed from the ground, they are in contact by their internal part.

The several stems having been thus arranged, the next and most important step is that of causing them to unite; this of course is requisite in order to produce strength, and is accomplished by the process of *grafting by approach*, or what is the same thing, that of *inarching*. For this purpose it is necessary to remove a small plate of bark at the proper season, on each stem where their inner portions are in contact; this having been carefully performed, approximate the two stems, so that the denuded portions of each shall exactly meet; tie the stems together at these places, and keep them

Digitized by Google

for a short time from the action of the atmosphere by means of a piece of clay. In the course of a few weeks, if these precautions have been attended to, adhesion takes place, and the result is, that a natural living fence has been formed, having openings of a diamond shape, which may be made of course of any size that may be required; it being only requisite to place the stems in the earth at a greater or less distance from each other.

The adhesion takes place in the following manner according to the laws of Vegetable Physiology. The plates of bark being removed on each stem, and the stems approximated to each other at that part, it follows, that as the fluids rise in the stems of exogenous trees, within the woody portion of the trunk and descend within the bark,—that the stems being closely tied to each other, and kept at their point of union from the action of the air, the *Cambium* exudes, forms new wood, and the stems unite by the natural process.

The advantages which I consider this kind of fencing to possess over that in ordinary use are the following:—

1st. That it is rustic, and has not the hard and stiff appearance of the fencing made by carpenters.

2nd. That so long as the trees of which it is formed are alive, it never requires to be in any way repaired, as living wood resists the action of the weather. The young shoots, should any spring forth, to be removed by the pruning knife.

3rd. That it may be carried to any height without additional expense, by training or running up the stems to the required height.

4th. That it acquires strength and thickness by the deposition of new wood annually; so, that in the course of years, when the stems have acquired the greatest degree of thickness, and have obliterated the openings, in the first instance made, a complete solid living wooden wall will be the result.

5th. That owing to the well known durability and power of resisting the action of the weather of the bark, and external portions of living trees, a fence made on this plan does not require to be covered with tar, or any other preparations requiring much time, labour, expense, and annoyance in the operation.

6th. That the first expense is the last, and is much cheaper also, in the first instance, than the ordinary kind of fencing employed, not requiring an annual expenditure to keep it in order; living wood, as before observed, withstand-

Digitized by Google

ing the effects of the weather to a much greater extent than dead wood.

7th. That a fence to orchards may be formed of fruit trees of the same genus, or genera in the same natural family; the lower portions or stems of which form the fence, (and may be carried as before observed, to the requisite height) whilst the upper part may be allowed to send forth its shoots and bear fruit.

8th. That owing to the open nature of this kind of fence, (which openings may be formed of any size) shrubs and other plants usually planted close up to fencework, for the purpose of concealing it, will receive a larger proportion of air and light so necessary to the growth of vegetables, which cannot be the case with the ordinary method of enclosing parks, &c., with palings.

9th. That should one of the bars by any cause become dead or destroyed, the circulation is carried on by the contiguous bar or stem; so, that if a bar dies, it still remains in its situation, although it does not increase in thickness as takes place in those around it; this dead bar may then be compared as to durability, to the fencing until the present time formed of dead wood.

From the well known nature and structure of wood, I consider the application of the process of *grafting by approach*, or *inarching* in the construction of fences of all descriptions, to be one of the leading improvements of late years made in the science of gardening; and as such, should strongly recommend it to the notice of those individuals possessing landed property, and also to the Directors of Railroads and other undertakings, where both man and cattle are intended to be kept off, and by the judicious selection of stems armed with prickles &c., a most effectual barrier would ultimately be the result.

Mr. Cooper exhibited specimens of *Polypgon Littoralis*, found below Woolwich, Kent. Some observations were also made on the variety of *Polygonum aviculare*, called *P. marinum* of Hudson, which led to some discussion.

OCTOBER 5TH.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

Some further remarks on the advantages of the natural living fence described at the last meeting were made, and a

Digitized by Google

specimen exhibited, being a portion of the original fence constructed by Mr. Breese, on the estate of Sir Thomas Neave's, at Dagnam Park, Essex. The Secretary read the following translation from the Annales des Sciences Naturelles, vol. 8, "*On the Formation of Crystals in the Cellules of Plants,*" by Dr. F. UNGER, (translated by Mr. J. Rich).

Some authors have wrongly maintained that the crystals which exist in plants are not found in the cellules themselves, but only in the intercellular passages; that which has possibly led them into error is that these groups of crystals are sometimes so voluminous as to distend the cellule and give it the appearance of being six times the size it is in the natural state. Generally these crystal cellules do not contain other organic substances; nevertheless I have found them in the same cellule, mixed with numerous grains of chlorophylle. Meyen first discovered crystals in the epidermal cellules, for up to that time it was thought that they belonged exclusively to those of the *parenchyma.* To the two plants, the *Maranta zibrina* and *Tradescantia discolor,* which he has signalized as presenting this peculiarity, I can add a third, the *Goodyera repens.* However, it is commonly in the cellules of the *parenchyma* that these inorganic bodies are observed. They exist in all the divisions of the vegetable kingdom from the most simple Algæ (Nostoc muscorum Confera crystallifera) to the most perfect vegetables. It is seldom that a single crystal is found in a cellule, but this peculiarity is remarked in the *Papyrus Antiquorum* and the *Ficus Bengalensis*; but in general each cellule contains several, even in the vegetables we have just named. In plants which have ethereal cavities the crystal cellules are often empty, and make a projection in the interior of these cavities; this is particularly the case in acicular crystals, as M. Meyen has shown in his Phytotomia. I have observed it also in the crystals disposed in stars of the *Myriophyllum spicatum.* The existence of crystals appears to be connected with that of the cellules containing sediment, and other substances, such as rosin, chlorophylle, &c. The vascular bundles on the contrary have nothing to do with the crystalline formations. Let us first occupy ourselves with the form of these crystals whose extreme smallness renders it exclusively difficult to determine, for nothing positive could have been said on this point if the angles that the surfaces make between them had not been measured. M. Raspail invented for this purpose his goniometrical microscope; but this instrument is very difficult to manage, so that the limit of his errors be less than the differences which exist

Digitized by Google

between the different vegetable crystals. One may be convinced by reflecting that the largest crystals I have examined had 0. 11 of a line in length, a great many 0. 023, and all the intermediate sizes up to the infinitely small. My conclusions on this point are exactly in accordance with those of M. Raspail. (I have given drawings as exact as possible of the crystals found in the cellules of the following plants; ficus bengalensis, Maranta zebrina, Musa paradisiaca, M. coccinea, Lucca gloriosa, Strelitzra regina, Papyrus antiquorum, Tritoma Uvaria, Aloe pulchra.) In these vegetables the crystals are separated, or at least free in the interior of the cellules, but they are often grouped and balanced between them as is seen in the several Rheums, in the *Myriophyllum spicatum, Herniaria glabra, Mercurialis perennis, Viburnum lantana, Cactus pendulus, Caladium nymphœfolium.* The chemical examination of these bodies offers no less difficulty than the determination of their physical form. Buchner, Schubler, Saigey, De la Fosse, Ness d'Esenbeck, and Raspail, are the only persons who have occupied themselves with it; their bases are lime, magnesia, and sometimes, though seldom, silex. The carbonic, oxalic, phosphoric, and tartaric acids, are combined with them. The method I have adopted differs from that of Raspail; I left the crystalliferous tissue to concoct in weakened nitric acid, filtered it, and then treated it with *ammonia.* I gathered the white precipitate, which then formed itself, and warmed it upon a plate of platina. The effervescence proved to me the existence of vegetable acid, which must be either tartaric or oxalic. The author adds in a casual manner some observations on the vessels of the *latex* in conformity with a plate which accompanies his paper. This is the substance of it. These vessels described by Schultz and Meyen are quite different to the vasa propria, as M. Mohl has proved; they contained a more mucilaginous juice, with a resinous or gum substance. The proper vessels form a part, thus to speak, of the vascular bundles, and probably perform a part in the transfer of the juices. The vessels of the latex, on the contrary, never accompany the other vascular bundles. They are constantly separated by cellular tissue, and develop themselves by *anastomosin,* with several cellules placed end to end. They appeared to me to belong to the cellular rather than the vascular system. In one of the figures the author has represented these newly formed vessels, such as those he had observed in the pith of the Ficus bengalensis; these are

Digitized by Google

quadrilateral cellules placed end to end; they do not differ from the other parenchymacal cellules, if it is not in their containing already a great number of these round granules, which form the greater part of the latex. This mode of formation is in harmony with what we observe in other organs, such as the spiral vessels, which are nothing but *anartomosed* cellules placed end to end. However, M. Unger has never been able to prove the movement of the *latex*, and he purposes recurring to the subject at a future time.

Mr. Wm. Baxter of Oxford forwarded a specimen of *Matricaria Chamomilla* (of which he found only a solitary plant in Cowley field near Oxford, on the 12th July, 1838,) differing from the common state of the species in the florets of the ray being very short and rather fewer than in the common one. Mr. Baxter stated that he had never observed it in that state before, neither could he find it noticed in any of the Floras. The same gentleman also forwarded forty-four species of British willows which were obtained from specimens sent to the Oxford Botanic Garden about three years since by Mr. Borrer, and kindly promised to augment the number the first opportunity.

NOVEMBER 2ND.

J. E. GRAY, ESQ., F.R.S., President, in the Chair.

The Secretary read the following remarks from a Member of the Society, on a "*Botanical Excursion to Cobham and Cuxton, Kent,*" in company with *several Members.*

The very general and indefinite manner in which our Floræ refer to the localities producing the plants they describe, has rendered a more particular and exact directory necessary for the purposes of the practical student, whose object is not merely to amass a certain number of species, but also personally to visit and investigate the locality in which each is produced, in order that he may observe the relation subsisting between its vegetable productions, its geological character and its geographical position, and thus be enabled to deduce inferences respecting the natural distribution and artificial culture of plants. Such directories some of our local Floræ and Botanical Guides profess to be, but

Digitized by Google

every one present, who like myself has often spent hours in the unsuccessful search after plants whose place of growth is described in some such general terms as "Tonbridge Wells," "about Dartford" or "between Cobham and Cuxton," will at once admit, that with reference to those plants which occur only in one or two localities, even these directories are by no means sufficiently precise and exact.

And I would ask, why is not the habitat of a plant pointed out with as much precision as the position of a rock? and why is not the former discovered by the Botanist as readily as the latter is avoided by the navigator. It is simply because the Botanist has hitherto been contented with a mere verbal description of the locality to which he referred, while the mariner has by means of the compass laid down on his chart, the exact relation of the spot he describes to some of the known objects by which it is surrounded, and by which it may certainly be recognized by subsequent observers.

These remarks on the imperfect methods at present employed by Botanists to point out the stations at which particular plants are produced, were suggested to me by the difficulty we experienced in discovering the Althæa hirsuta and Salvia pratensis in our late excursions to Cobham, and I have been induced to contrast their inaccuracy with that of the mariner, in order more clearly to point out the advantages which would result from making the compass the companion of the vasculum, and to justify me in suggesting that in all our future attempts to describe localities we should carefully select two of the more conspicuous objects in the neigbourhood, and accurately note their relation (as ascertained by the magnetic needle) to the spot described.

By the adoption of this means not only may a church or a castle, a windmill or a barn, a mountain point, a water stream, or line of road, be made an almost infallible guide to a fertile spot which it might cost the inquirer hours to discover; but the limits over which some of the more strictly local plants are now diffused being thus accurately noted, their further extension may hereafter be observed, and possibly our knowledge of the laws which regulate the dispersion of plants may thus be increased.

Having made these remarks on the advantages which would result to Botanists from a more frequent use of the compass, I proceed now to the proper object of this narrative, which is to place on record among the papers of this Society a brief memorandum of the place of growth of some

Digitized by Google

of the more rare and interesting plants observed during the two excursions to Cobham, which have been made by myself in company with other members of this Society during the present year. On the first of these excursions I proceeded from Woolwich by way of Plumstead-Common, Welling, Bexley, Crayford, Dartford Heath, Wilmington, Sutton at Hone, Darent, Stone and Northfleet; and on the second, when I had the pleasure of being accompanied throughout by our Curator, our route was by way of Plumstead Marshes, Wickham, Welling, Dartford, Darent, Longfield Hill, and Merstead to Cobham. Having promised this general view of our course on each of these excursions, I shall now commence the enumeration of the several species which deserve particular notice.

Polypogon Monspeliensis. We found this rare and beautiful grass growing abundantly on the banks of ditches, and in boggy places in the Marshes East of Woolwich, particularly in front (i. e.) south of the Butt or Mound in the Plumstead Practice-ground.

Polypogon littoralis. "Near the Magazine, four miles below Woolwich," has often been referred to as one of the few places producing this species, and Sowerby has figured a specimen from that locality; I have, however, often searched for it there in vain, and was therefore greatly delighted at finding it associated with the former species in the bay, immediately in front of the Butt to which I have before alluded.

On ditch banks forming the East border of the Practice-ground, we observed *Poa distans, procumbens* and *maritima,* and in the water *Zannichellia palustris, Potamogeton pectinatum* and *Scripus lacustris* with the *Polygonum maritimum* of *Ray,* described at our last meeting.

At a considerable distance from this marsh, about the middle of the Sandy Hill leading from Woolwich to Plumstead Common, we found in the hedge-banks on the left a small plot of *Erysimum Cheiranthoides,* a plant whose foliage and flowers rival each other in elegance.

Passing over Plumstead Common to a road called the King's High-way, I found in a little wood on the right of this road the *Orobus tenuifolius* of *Roth.* This plant which Wildenow, Smith, and Hooker, agree in regarding as a narrow-leaved variety of *Orobus tuberosus,* is considered by Don and others as a distinct species. The following characters which are permanent in cultivated plants are given by Mr. D. Don in the 3rd vol. of the Memoirs of the Wernerian Society, and sufficiently distinguish this from the common species.

Digitized by Google

O. tuberosus *Roth. Flor. Germ.* 1-305. Foliis impari-pinnatis, pinnis anguste linearibus supra canaliculatis, apice muscronatis; stipulis lanceolatis mucronatis posticibus bidentatis, racemis paucifloris.

Radix tuberosa, caules decumbentes debiles angulati angulis alatis, folia alterna impari-pinnata, pinnis anguste linearibus supra canaliculatis nervosis subtus hirsutis apice mucronatis externi minutissimo; stipulæ semi sagittatæ lanceolatæ mucronatæ margine ciliatæ, posticibus bidentatis; racemi axillares pauciflori; flores lilacini, vexillo alisque striatis.

The next plant whose place of growth I shall name, is *Campanula Rapunculus*. This is stated in Turner and Dilwyn's Botanist's Guide, to occur in hedges between Bexley and Dartford. I may add for the sake of rendering this direction a little more exact that I found it abundant on the border of a small wood adjoining the first field through which the footpath passes from Bexley Church to Dartford Heath.

On Dartford Heath, *Ulex nanus* and *Genista anglica* were seen between the Folly House and Wilmington workhouse, and *Bupleurum rotundifolium* on the side of a lane between Mount Pleasant and Northhell's Farm, both near Wilmington. Passing from this lane towards Sutton Church through some chalky corn-fields called the Hollow Denes, I observed *Fœdia dentata, Bromus erectus* and *secalinus, Agrostis Spica-venti, Plantago media, Linaria minor, L. Elatine* and *L. spuria, Euphorbia exigua, Cistus Helianthemum, Adonis autumnalis* and *Ajuga Chamæpitys*, all of them common plants in this neighbourhood.

In addition to most of these, *Galium tricorne, Anagallis cærulea, Papaver hybridum* and *somniferum*, were also found in the first corn-field to the left of the Fox and Hounds at Darent Lane's End, while the wood above this field afforded *Astragalus glycyphyllus, Asperula Cynanchica* and *Rubus cæsius?* on its borders. Leaving this productive spot, and returning to the high road, we saw the white cliffs of Northfleet varied with the red and yellow flowers of *Valeriana rubra* and *Crepis biennis*. The approach of night prevented my observing any other plants between Northfleet and Cobham; but the following day, in company with several members, we found *Brachypodium pinnatum* and *Dianthus Armeria* on the side of the road leading from Cobham to the Park;

Digitized by Google

and crossing the Park by the first path on the right, we entered the small copse by which this portion of it is skirted, and about a chalk pit near the gate observed *Bromus erectus*, *Orchis conopsea*, *Listera ovata*, *Astragalus glycyphyllus*, and a variety of *Origanum vulgare* with white flowers, and in the field below *Papaver hybridum* and *somniferum*, with *Bupleurum rotundifolium* and *Fædia dentata*, while the hedge bordering this field afforded *Rosa spinosissima* and *Campanula Trachelium*. Leaving this field and passing by the footpath towards Cuxton, we found in the field above the lodge near the style joining the high road, so much of the *Brachypodium pinnatum* that the turf was coloured of a beautiful pale green by its abundance, and on the bank bordering the corn-fields at the back of the lodge, *Atropa Belladonna* and *Marrubium vulgare* occurred plentifully.

In a hilly field immediately behind Brick House Farm on the Cuxton Road, which has recently been converted into a fir plantation, we found *Salvia pratensis* and *Rosa Rubiginosa*, particularly at the upper part of the field about forty paces from the hedge bordering it on the left. All over this field *Campanula glomerata* and *Chlora perfoliata* were abundant.

Returning again towards Cuxton, we picked on our way one plant of *Orobanche major*, and on the banks of the Medway saw *Triticum junceum*, *Beta maritima*, *Statice Armeria* and *Limonium* and *Artemisia maritima* in abundance.

Following the line of road pursued in our second excursion, I may remark that in addition to many of the plants already named, we found on the road side between Darent and Longfield Hill, *Artemisia Absinthium* and *Bupleurum rotundifolium*, and at Cobham, *Althæa hirsuta* and *Salvia pratensis* in a different spot to that formerly described. I shall point out the station in which these plants were described, and then conclude.

"Near the junction of the three parishes of Cobham, Cuxton, and Stroud," has long been the direction given for finding these rare plants. Its inefficiency is proved by the circumstance of five individuals who were present in our first excursion having sought for it by this direction in vain, I shall therefore note the line of road by which we discovered them. Entering the Park by the gate nearest to Cobham, we passed by the road near the Mausoleum to the large beech tree which forms the point of junction of the three parishes I have named, following this road to the

Digitized by Google

border of the wood, we inclined to the right, along the upper end of the field to which it leads, and here in a spot directly North of Cuxton Church, both plants occurred in abundance.

NOVEMBER 16TH.

J. E. GREY, ESQ., F.R.S., President, in the Chair.

Mr. W. M. Chatterley read the following Paper "*On the Advantages of Botanical Statistics, illustrated by the Order Coniferæ.*"

IN alluding to the tribe of the Coniferæ, I do not intend on the present occasion, to call your attention either to Botanical structure or affinities of the plants comprising that order; indeed, were I to do so, I could but repeat the words of Lambert, Richard, Brongniart or Brown, to whose works I beg to refer you for any information on this subject; to those of the latter especially, whose able scientific memoir on this subject, is attached as a part of the Appendix to Captain King's Voyage to New Holland.

I wish only to draw the attention of the Society to the statistics of this tribe in particular, and to the subject of the general connection between the science of Botany and that of statistics, a connection which I am inclined to think has not met with that attention, which its importance would seem to have demanded. Surely, if it be interesting, as it cannot be doubted but that it is to all men of enlarged and philanthropic views, to know that through their own labours, and the labour of their predecessors and coadjutors a large amount of benefit has accrued to society; so it can be no less interesting, nay important, to attempt to appreciate, as far as data will permit the amount of good thence derived, and to calculate its progressive increase.

This we are enabled to do though imperfectly, by reference to Statistical Tables; I say imperfectly, for these Tables are themselves as yet imperfect, even as far as regards the commercial relations of our own country, and it is but in few others that their importance is acknowledged by the ruling

Digitized by Google

powers. Under some governments it is thought sufficient to keep an imperfect account of the births and burials of their subjects; under others even this is not attended to, and it is impracticable. As we are thus, to a great extent excluded from Foreign Statistical data, we must necessarily confine our investigations to those of our own country.

We have in this country a set of Statistical Tables, prepared by Mr. Porter, and presented by command of the government to both Houses of Parliament; they include the statistics of the last seventeen years; the first volume containing ten years, from 1821 to 1831, since when, five others have appeared, more perfect in their details than the first, and bringing the tables up to a later date, 1835; but as these are prepared for the most part from the data to be found in the various government offices, such as the Excise, Customs, and other tax offices, together with some documents prepared especially for this purpose by order of the government, and though no one can doubt but that these data are exceedingly numerous, yet, they are defective in many of the details, and certainly so in any scientific arrangement: hence it becomes eminently the duty of all those whose peculiar studies may have fitted them for the investigations of particular subjects, to carry out the data thus furnished them; as it is the business of the chemist to investigate the proportionate consumption of those articles more immediately appertaining to his science, so it should seem to be no less the duty of the Botanist to carry out similar investigations, with respect to those appertaining to the object of his own studies; to the philanthropist, whatever branch of science he may pursue, the importance must be obvious, and further explanation useless.

It is, however, the more incumbent on each to make these investigations for his own science, not only that each would be better qualified to give a proper scientific arrangement to the results, but that there is so limited a number of persons who confine their attention solely to statistical investigations, that it cannot be expected that they should be able to perform the whole of the operations necessary to produce the most perfect results.

The science of statistics too, is not a science difficult to be acquired, requiring little besides mere diligent and plodding labour to produce the desired results; in this it scarcely differs from any other study, though it is wanting in the

Digitized by Google

other pleasing accompaniments afforded by the study of Botany.

I trust I have now shown, that it is not on the statist *alone* that we should rely for satisfactorily investigating the connection between the two sciences of Botany and Statistics, and their general relation to the welfare of mankind.

The importance of the subject and the necessity for its pursuit by other than the mere statist, being acknowledged, the facilities for the investigation afforded to the Botanist, by the natural classification of plants, according as it does with their general properties, would seem immediately to direct us to the consideration of the statistics of each order, and to the grouping of the results in accordance with such natural arrangement; with this view I have made the following very *imperfect* attempt with an order, exceedingly important from the various economical purposes to which the products of the various plants composing it are applied.

The order Coniferæ is divided into two sections, the Abietinæ and Cupressinæ: the chief of the properties which render this tribe so important reside in the first section, the Abietinæ, and are chiefly confined to the genera Abies, Larix and Pinus in that section.

These properties seem very simply to be divided into two distinct kinds, viz., 1st, those which reside in the wood as timber; and 2ndly, those which reside in the eliminated juices.

The first consists of that kind of timber imported into this country under the several names of deals and deal ends, batten and batten ends, masts, lathwood, and fir timber.

The deals are the trunks of the trees sawn into planks, varying in length from 6 feet to 45 and upwards, having a breadth of 7 inches, and a thickness of from 3¼ in. to 4 in., and thus pay a duty, varying in accordance with the sizes of the deals, from £2 to £10 per 120, if imported from our British Possessions in North America; but if imported from foreign countries the duties are much higher, varying from £8 2s. 6d. to £44 per 120.

The deal ends are planks shorter than 6 feet, having similar width and thickness with the deals, and pay a less amount of duty per 120 than the deals. When coming from British North America they pay a duty of from 15s. to £1 10s.; and from foreign countries from £6 to £12. The number of deals and deal ends imported has gradually increased from the year 1820 to 1835.

Digitized by Google

The following is the amount of importation and net revenue for several of the intermediate years, viz.:

	Great Hundreds.	Net Revenue. £
1820	36,265	405,751
1825 (a very large amount)	77,074	942,934
1830	56,204	560,521
1834	67,105	601,914
1835	61,731	582,485

The average importation, consumption, and revenue for the fifteen years from 1821 to 1835 inclusive, is as follows:

Import. Gt. Hunds.	Consumption. Gt. Hunds.	Net Revenue. £
53,868	53,440	629,266

But it should be observed that though the consumption is on the average less than the importations, still in many years it is much greater, and this must be attributed either to the working up of the old stock, or the use of home grown timber; although I am not sure that the imports of the latter are included in this estimate. The amount of exportations it is scarcely worth while to consider in so general a view as the present, it being not more than 750 gt. hunds., about 1 in every 72.

The countries whence deals and deal ends are principally procured for our home consumption are our North American possessions, as might be inferred from the immense difference in the duties on timber brought thence and that coming from foreign countries; this difference has been instituted for the purpose of protecting the trade in these Colonies, which consists chiefly of timber; and the very great disproportion in the duties has been found necessary from the very great superiority of the Baltic timber, that is the timber from the north of Europe; which superiority would counterbalance a very large increase of outlay in the first instance, hence we have an exorbitant duty laid upon good timber, for the purpose of forcing us to use bad timber; or as it is said, to protect the North American trade. It may be useful to compare the accounts of the importations of deals and deal ends for any one year from the countries bor-

Digitized by Google

dered by the Baltic Sea, and those bordered by the St. Lawrence river; for instance, the year 1833, when we imported from

	Gt. Hunds.	
Russia	10,815	
Sweden	2,633	
Norway	7,124	
Prussia	4,229	
Total from Countries bordered by the Baltic		24,801
British Possessions, N. A. .		30,974

So we import bad timber some 4,000 miles at a great expense, while we could have a superior article from places less than one-fourth of that distance; in fact, the annual loss to the community has been under estimated at £1,000,000 sterling.

Deals are also obtained, though in small quantities, from the following countries, besides those already mentioned:— Germany, Holland, Belgium, France, Portugal, Italy, East India Company's territories and Ceylon, British West Indies, Isles of Guernsey, Jersey, Alderney, and Man; but from all these, in the same year as that above quoted, viz. 1832, the whole amount of deals imported was not more than 15 Great Hundreds.

(To be continued.)

NOVEMBER 29TH.

J. E. GRAY, Esq., F.R.S., President, in the Chair.

Anniversary Meeting.

The Secretary read the Annual Report (as appended to these Proceedings), which was unanimously adopted.

After which the Society proceeded to ballot for the election of Officers, when the following gentlemen were declared duly elected:—

Digitized by Google

John Edward Gray, Esq., F.R.S., *President.*

J. Reynolds, Esq., *Treasurer.* | Daniel Cooper, Esq., *Curator.*

G. E. Dennes, Esq., *Secretary.*

Other members of the Council—

John Anderson, Esq., M.E.S.	Charles Johnson, Esq.
Francis Bossey, M.D.	H. A. Meeson, M.D.
W. M. Chatterley, Esq.	William Ord, M.D.
J. E. Children, Esq., V.P.R.S., &c.	D. C. Macreight, M.D. F.L.S.
Joseph Freeman, Esq.	W. H. White, Esq.
T. W. Greene, Esq., B.C.L. F.H.S.	

The President then appointed the two following gentlemen as Vice-Presidents,

J. G. CHILDREN, Esq., V.P.R.S., &c. | Dr. D. C. MACREIGHT, F.L.S., &c.

The following Address was then delivered by the President:—

Gentlemen,

It may be expected that I should, on this occasion, make a few remarks on the progress and prospects of the Society, as you have done me the honour to elect me a third time as your President, although I should have wished the choice had fallen on one who was more actively engaged in Botany, and who could devote more of his time to your services; though, at the same time, allow me to say that there are few persons more desirous of making himself useful to this and other institutions devoted to education in all its multifarious branches than myself. From the report read by the Secretary, I am glad to find the Society has been gradually and steadily increasing, the number of members amounting to one hundred, of which forty-two are resident, thirty-four corresponding and twenty-four foreign, forty-seven of which have been elected since the last anniversary. The Curator in his report has referred to the great additions which have been made to the Herbarium, both British and Foreign, during the past year; and he informs me that the number of British plants received this year consists of eighteen thousand five hundred and ninety-two specimens, containing one thousand and fifty species, four hundred and twenty-two genera, and ninety-eight natural orders.

Digitized by Google

The Foreign Herbarium consists of upwards of ten thousand specimens, but, as we must be all aware who know the numerous occupations of our Curator, that he has not as yet, from the want of time, been able to arrange and distribute them into their genera and families: indeed, when we consider that the Curator only holds an honorary office, and is engaged in his medical avocations, &c., and the time and great labour required to arrange and distribute the British plants alone, we can only thank him for his industry, and wait until he has more leisure to attack the Foreign Herbarium, which, though not at present arranged, is rapidly increasing in extent, and will, no doubt, be eventually a very large and useful collection. To facilitate the arrangement of the British species, the Council deputed Mr. D. Cooper to print a list of the Natural and Linnæan Orders,* for labeling collections; and for the purpose of giving the same assistance to the members, they have caused to be printed several copies which may be procured at a reasonable price.

It is with great pleasure I refer to the kind manner in which the Botanical Society of Edinburgh has responded to our invitation to open a correspondence between the *two* Societies, and more especially to the result of that correspondence which has been the reception of a large parcel of British and Foreign plants from their stores. I hope this will be the commencement of a long and beneficial intercourse, which cannot but be mutually advantageous to the two Societies.

While speaking of the great additions to the Herbarium, I cannot avoid alluding to the continued exertions made by our Local Secretaries resident in different parts of Britain, &c., and who being for the most part the best practical Botanists in the different counties in which they reside, are exerting their endeavours to forward our views.

Indeed, in taking a review of the proceedings of the past year, the pleasant and friendly meetings we have had in this room, the interesting papers which have been read, the discussions which have ensued, the instructive lectures which were given to the members by our excellent and industrious Curator, and the pleasant Botanical excursions which have been taken by the various members of the Society, in com-

* List of Decandolle's Natural Orders and Genera, together with the whole of the Linnæan Classes and Orders for labeling British Collections. Double demy sheet. Longman and Co.; Machlachlan and Co. Price One Shilling.

Digitized by Google

pany with one another (judging from the delightful recollections I have of the one I was enabled to join in), I cannot but consider that the Society has had a beneficial influence on the progress of Botany, by making new votaries in the train, and has not been deficient in *social comfort*, which should be one of our most ardent desires.

At the request of several of the original members of the Society, the Council have determined on publishing the first part of its Proceedings, which, they trust, will show that they have not altogether been in the back ground, considering the short time the Society has been in existence. They moreover trust that each individual member will subscribe for a copy, and will likewise use his endeavours with his friends to do as much as possible in helping to defray the expenses attendant on them; owing to the low annual subscription and the several advantages the members receive for it, they are not enabled to present them gratuitously to the members.

With regard to the Botanic Garden, as proposed as one of the objects of this Society, your Council have been delayed from entering into any speculations of the kind until they feel assured of its success, but have determined to proceed surely but slowly in working out that desideratum and have set aside all idea at present of carrying it into effect; moreover, I find a Society is attempted to be established in this metropolis under the name of the Royal Botanic Society, for the express purpose of forming a garden in the Regent's Park, which will, I am told, be open to visitors on the same terms as the gardens of the Zoological Society. But while wishing that Society every success, as I always have wished every Society that has been established for the spread of knowledge and pleasure among the people, I think it incumbent on myself to mention, that in their Prospectus I find they have placed my name down amongst the list of its "*Proposed Fellows*," without the slightest authority on my part, and I am informed that the same has been done with one of my friends, a member of this society; which is the more to be regretted, as from the expensive manner in which the Society appears to proceed, I have determined not to be in any way connected with it until it be firmly established.

Having now referred to each of the heads which appear most important in direct communication with the Society, I wish to say a few words on the progress which Botany has made during the past year. Before so doing, it may be as

Digitized by Google

well to state, that there has been in the course of the year two works published on the subject, giving a history of Botanical Science during the preceding year. They are of very different character, each having its peculiar interest to the Botanical student. One by J. E. Wickstrom in the Transactions of the Royal Society of Stockholm, giving a good abstract, in systematic order, of the various works and papers, similar, but at greater length than in my outline of Progress of Botany for the year 1820, published in the the Annals of Philosophy for 1821; and the other above alluded to, is by Professor Meyen, appended to Professor Weigman's Archives. It is chiefly interesting as containing the theoretical views of the author. This latter is about to be translated into the English language by Mr. W. Francis.

It is my intention only to refer to the more important works and papers, as otherwise, I fear I should be detaining you longer than would be agreeable to your patience. Commencing with the labours of our native Botanists, I may observe that, they form a very important item in the history of the science, as is proved to have been the case in former years, by the numerous references that are made to them in the histories of the progress of Botany, before referred to.

Sir. W. J. Hooker, has published a new edition of his excellent and useful *Flora*, and which he has rendered more serviceable by the addition of plates, illustrating the genera of *Gramineæ* and *Umbelliferæ*, which are generally so difficult for the *Tyro* to understand. Dr. D. C. Macreight, our industrious Vice-President, has also published a very useful manual of British Botany, in which the whole of the British plants, and those ordinarily cultivated in Britain, are arranged according to the natural system of Decandolle, with excellent Analytical Tables, for the more easy making out of the species.

Mr. William Baxter has proceeded regularly with his illustrations of the genera of *British flowering plants*, and Mr. C. E. Sowerby continues the republication of the *English Botany* on a cheap plan. These two works are so well known as to require no comment from me. But we have had new additions to the works, giving figures of British plants in the "*Ferns*," and "*Little English Flora*," of Mr. G. Francis' works, which for the beauty and accuracy of the figures, and neatness of description, and cheapness, deserve the greatest praise. The Rev. M. J. Berkeley has, with his usual accuracy, been examining and giving some details of the more

Digitized by Google

minute part of the organs of fructification of the *Fungi*, which must be considered as very valuable additions to our knowledge of the history of these curious, but little known tribe of vegetables.

Of the works of English Botanists on general and exotic Botany, I need only refer to the completion of Dr. Hooker's *Flora of North America*; to Dr. Lindley's *Monographic Illustrations of Orchideæ*; to Mr. Bateman's magnificent work on the *Orchideæ of Mexico*; to Mr. Bentham's important labours on the *Labiatæ* and *Scrophularineæ;* of the physiology of plants, to the very interesting and philosophical papers of Mr. Griffiths on the *development of the Ovulum*, in the transactions of the Linnæan Society, and in the Asiatic Researches. But of the works which I consider of the greatest importance in this class, is the *Descriptions of the Plants collected in Java* by Dr. Horsfield, and published by Mr. Bennett, with observations on their structure and affinity, by Mr. R. Brown, which, to use the words of a celebrated Practical Botanist, "Is one of the most valuable contributions, not only to the plants of the East, but to Botany in the abstract, which has appeared in this country; for the fruits of Dr. Horsfield's researches in Java, have elicited some of those profound observations on structure from Mr. Brown, which are alone sufficient to stamp the work with a classical authority. But, independent of these contributions from this eminent naturalist, we view Dr. Horsfield's works with peculiar satisfaction, from the evidence it affords of the sagacity and research of Mr. Bennett, who has given ample proofs, in this work, of his capacity to follow in the steps of his distinguished principal. It is with no little pride, that we hail the dawn of a reputation, which is to reflect lustre on our National Establishment."

Amongst the more striking works of the Foreign Botanists, I need refer only to the continuation of Decandolle's *Prodromus*, which is completed to the end of the *Compositæ;* and when we consider the immense labour of this gigantic undertaking, all Botanists must be thankful for the completion of any one of the families. Professor Kunth has published a work on the *Species of Cyperaceæ*. M. Martius has continued his magnificent work on the *Palms*. Endlicher has commenced a new *Genera Plantarum;* and in company with our illustrious countryman, Mr. Bentham, has published *Illustrations of Pöppig*, and *Ungel's Collections of Plants*. In the physiology of plants, Professor Schleiden has made some important remarks on their development.

Digitized by Google

At the present moment there is an active controversy in progress, especially among the German Botanists, as to the use of the *Stamens* and *Germen*. Professors Schleiden and Endlicher having broached the theory, that the stamens, instead of being the *male* organs, are similar to the *ovaria*, the *style* as the *fallopian tubes*, and *germen* the *ovary* of the vertebrated animals. They state that the *male organs* of the plant are to be searched for in the *stigma*.

Having now referred to some of the most important works, which have appeared during the past year or two, I have a more melancholy duty to perform, namely, to refer to the great losses, which it has been our misfortune to have experienced during the same period, and you may estimate the extent of our deprivation, when I inform you, that France alone has lost A. L. de Jussieu, Labillardier, and Desfontaines, three men who have exerted the greatest influence on the progress of Botany in that country, and the world. They all lived to, and almost beyond the usual age of man; yet, when I recollect the pleasure I have experienced, especially with the first, I can but feel as though I had lost a private friend. It would be useless were I to point out the labours of these illustrious men. Their works have had, more especially, the greatest effect on the science of Botany of any other individuals since the time of Linnæus.

Digitized by Google

Digitized by Google

Botanical Society of London.

Instituted, November 29th, 1836.

75, NEWMAN STREET, OXFORD STREET.

1839.

President,

JOHN EDWARD GRAY, Esq., F.R.S. &c.

Vice-Presidents,

J. G. CHILDREN, Esq., V.P., R.S. | D. C. MACREIGHT, M.D., F.L.S.

Treasurer,

JOHN REYNOLDS, Esq.

Curator,

DANIEL COOPER, Esq., A.L.S.

Secretary.

GEORGE E. DENNES, Esq., F.L.S.

Other Members of the Council,

JOHN ANDERSON, Esq. M.E.S.
FRANCIS BOSSEY, M.D.
W. M. CHATTERLEY, Esq.
T. W. GREENE, Esq. B.C.L. F.H.S.
JOSEPH FREEMAN, Esq.
H. A. MEESON, M.D.
WILLIAM ORD, M.D.
W. H. WHITE, Esq.
W. H. WILLSHIRE, M.D.

Local Secretaries,

MR. W. BAXTER, A.L.S. Botanic Garden, Oxford.
T. BODENHAM, Esq., Abbey Fore Gate, Shrewsbury.
MR. J. A. BREWER, Reigate, Surrey.
JAMES BUCKMAN, Esq., Cheltenham.
MR. ISAAC BROWN, Hitchin, Herts.
G. H. BETTS, Esq., M.R.C.S. Watford, Herts.
C. CONWAY, Esq., Pontnewydd, Monmouthshire.
T. J. DYKE, Esq., M.R.C.S., Merthyr Tydvil, Glamorganshire.
H. B. FIELDING, Esq., F.L.S., Stodday Lodge, Lancaster.
W. B. LUMB, Esq., M.R.C.S. Rochdale. Lancashire.
T. G. R. RYLANDS, Esq., Bewsey House, Warrington.
M. H. COWELL, Esq., Faversham, Kent.
J. W. HOWELL, Esq., M.R.C.S., Bath.
G. H. K. THWAITES, Esq., Bristol,
ROBERTS LEYLAND, Esq., Halifax, Yorkshire.
EDWIN LEES., Esq., F.L.S., Dryadville Cottage, Worcester.
F. C. LUKIS, Esq., Guernsey.
T. B. SALTER, M.D. F.L.S. Poole, Dorsetshire.
M. J. F. SIDNEY, Esq., Cowpen, near Morpeth, Northumberland.
D. STOCK, Esq, Bungay, Suffolk.
DR. FERDINAND KRAUSS, Cape of Good Hope.
JOHN KNOTT, Esq., M.R.C.S., Adelaide Town, South Australia.
JOHN J. LAUGHTON, Esq., Kingston, Jamaica.
MR. ARTHUR WALLIS, Chelmsford, Essex.
T. B. HALL, Esq, Coggeshall, do.

THE BOTANICAL SOCIETY OF LONDON is instituted for the promotion and diffusion of Botanical Science, by the

Digitized by Google

formation of an Herbarium; the exchange of specimens with other Societies, or with individuals; the reading of original and other Papers; the formation also of a Library and Museum; and by the establishment of a Botanic Garden, as soon as the funds of the Society will permit.

Extract from the Second Annual Report, read 29th November, 1838.

The number of Members amounts to one hundred, of which forty-two are Resident, thirty-four Corresponding, and twenty-four Foreign, forty-seven of which have been elected since the last Anniversary; and the Council are happy to state that they have received no notice of secession of Members.

The Council refer with pleasure to the list of donations to the Library, Herbarium, and Museum. The names of the various donors to the Library are as follow:—Messrs. J. E. Gray, E. Charlesworth, W. Baxter, D. Cooper, G. E. Dennes, J. Rich, W. F. Rock, N. Wood, Dr. Krauss, and the Botanical Society of Edinburgh.

Donations of British Plants have been received from the following Ladies and Gentlemen, arranged in the order of the number and value of the specimens sent:—

H. B. Fielding.
C. Conway.
T. B. Salter.
D. Cooper.
Edwin Lees.
Daniel Stock.
D. C. Macreight.
G. E. Dennes.
T. Bodenham.
W. B. Lumb.
W. Baxter.
J. A. Brewer.
M. H. Holman.
Joseph Freeman.
J. E. Gray.
W. M. Chatterley.
M. H. Cowell.
A. Rutherford.
J. G. Children.
R. J. Streeten.
T. B. Hall.
F. Bossey.
A. Wallis.
Rev. G. Gordon.
T. Corder.
Isaac Brown.
J. F. Young.
G. H. K. Thwaites.
R. Ranking.
J. Buckman.
J. Seeley.
John Anderson.
E. Rogers.
J. Riley.
J. Rich.
W. D. Paine.
Miss C. Perry.
T. Sansom.

Digitized by Google

The number of Specimens received, amounts to 18,592, including 1050 species, from which the Society's collection has been considerably enriched; especially through the kindness of Mr. Baxter, in presenting a valuable collection of British *Salices*, comprising forty-four species, from specimens presented by Mr. Borrer to the Oxford Botanic Garden. The Society has also received nearly the whole of the British *Carices*, and solicit the attention of Members in completing the genera *Rosa* and *Rubus*, together with the *Cryptogamia*; and in order to afford every facility for examining the Herbarium, the rooms of the Society will be open two hours previous to the chair being taken at the ordinary meetings, when the Curator and Secretary will attend, to render any required assistance.

The distribution will take place in the month of January next, when each Member will receive such of his desiderata, as may be contained in the Herbarium, in proportion to his contribution. Those Member who have not contributed to the Herbarium, receiving their duplicates after the distribution to the contributors has taken place.

The number of the Foreign plants received, amounts to upwards of 10,000 specimens, principally from the collection of the Botanical Society of Edinburgh (who also largely contributed to the British Herbarium), H. B. Fielding, Esq. Baron Macedo, Mr. Adam White, Mr. D. Cooper, and Mr. J. Rich. The Council have much gratification in informing the Members that they have made arrangements with the Council of the Botanical Society of Edinburgh, who have promised them every assistance, and that a mutual exchange of specimens will annually take place, which cannot fail to be of great advantage to the Members of both Societies.

To Robert H. Schomburgk, Esq., the Society is much indebted for communications, accompanied by drawings of *Triplaris Americana*, and *Bertholletia excelsa*, the latter accompanied by specimens of the fruit, bark, and liber, of that tree; and from whom a specimen of the leaf of *Victoria Regina* has been received, which the Council deemed advisable to deposit in the Herbarium of the British Museum.

From D. Stock, Esq., the Society has also received a valuable collection of Seeds.

In order to advance as much as possible the interests of the Society, the Council have caused to be published a sheet of the whole of "*De Candolle's Natural Orders and Genera*," together with the whole of the "*Linnæan Classes and Orders*," in such a form as will serve the purpose of arranging

Digitized by Google

British collections.* This, in conjunction with the list of species published by the Botanical Society of Edinburgh, will furnish the British collector with a complete series of printed labels of the Natural and Artificial orders, genera, and species, for the wrappers of his collection.

In conclusion, the Council have to state that they are much indebted to the following Members for their interesting communications, some of which will be published in the forthcoming proceedings of the Society.

Dr. F. Bossey, Messrs. W. M. Chatterley, D. Cooper, George E. Dennes, J. Riley, Robert H. Schomburgk, J. Rich, A. Wallis, W. H. White, &c. &c.

The Meetings of the Society are held on the first and third Friday of the month, from November to June; and on the first Friday of every other month, at their rooms, 75, Newman Street, Oxford Street, at 8 o'clock, P.M. precisely; where communications to the Secretary are requested to be addressed.

Ladies are eligible as Members upon the same terms, and possess the same privileges as gentlemen.

Annual Subscriptions:

Resident Members, One Guinea; Life Subscription, Seven Guineas; Corresponding Members, Half a Guinea; Life Subscriptions, Three Guineas and a half; Admission Fee, One Guinea.

* The Catalogue of Plants above alluded to, may be had of Longman and Co., London; Maclachlan and Co., Edinburgh; Currie and Co., Dublin. Price One Shilling.

Digitized by Google

LIST OF MEMBERS

OF THE

BOTANICAL SOCIETY OF LONDON,

FEBRUARY 1839.

I.—HONORARY MEMBERS.

BRITISH.

1838. His Grace the Duke of Northumberland.
His Grace the Duke of Bedford.
His Grace the Duke of Devonshire.
Sir Wm. Jackson Hooker, F.R.S., F.R.A.S. F.L.S. &c. &c., Regius Professor of Botany in the University of Glasgow.
Alymer Bourke Lambert, F.R.S., Vice President of the Linnæan Society.
John Joseph Bennett, F.L.S., M.R.G.S., &c.
Robert Graham, M.D., F.R.S.E., Pres. Bot. Soc. Edin., Professor of Botany in the University of Edinburgh.
Thomas Coulter, M.D., M.R.I.A.

FOREIGN.

1838.
April 20th. Carolus Adolphus Agardh, *Acad. Reg. Sc. Holm. Soc. Episcopus Carlstadiensis*, Lund.
Carolus Ludovicus Blume, M.D., *Instit. Reg. Batav. Soc.*, Lugduni, Batavorum.

Digitized by Google

1838.

April 20. Adolphus Brogniart, M.D., Professor of Botany at the Garden of Plants, Paris.

Auguste Pyrame De Candolle, F.R.S., F.L.S., Member of the Institute of France, and Professor of Natural History, at Geneva.

Gotthelf Fischer De Waldheim, M.D., Professor of Natural History, Moscow.

Baron Benjamin De Lessert, Hon. Memb. of the Academy of Science, Paris.

Elias Fries, M.D., Professor of Botany, Lund.

Don M. La Gasca, F.L.S., Professor of Botany, Madrid.

Asa Gray, M. D., New York.

James Wilken Hornemann, F.L.S., Professor of Botany, Copenhagen.

Alexander Baron De Humboldt, F.R.S., F.L.S. Member of the Institute of France, and of the Royal Academy of Sciences, Berlin.

Adrian De Jussieu, M.D., Member of the Institute of France, and Professor of Botany at Paris.

Carolus S. Kunth, Corresponding Member of the Institute of France, Berlin.

Henry Frederick Link, M.D., F.L.S., Professor of Botany, and Member of the Royal Academy of Sciences, Berlin.

Baron Von Ludwig, Cape of Good Hope.

Baron Macedo, Lisbon.

C. F. P. De Martius, M.D., F.L.S., Member of the Royal Academy of Sciences, and Director of the Botanic Garden, Munich.

C. F. Brisseau Mirbel, F.L.S., Member of the Institute of France, and Professor of Botany at the Sorbonne, Paris.

C. G. Nees Von Esenbeck, M.D., F.L.S., President of the Imperial Academy Naturæ Curiosorum, and Professor of Botany, Breslau.

Robert H. Schomburgk, British Guiana.

Georgius Wahlenberg, M.D., Professor of Botany, Upsal.

Digitized by Google

II.—RESIDENT MEMBERS.

1836.

Original Members.

John Edward Gray, Esq., F.R.S., F.G.S., F.Z.S., &c., &c., President.
Daniel Chambers Macreight, M.D., F.L.S., F.B.S.E. Vice President.
John Reynolds, For. Sec., M.S.L., Treasurer.
Daniel Cooper, A.L.S., Curator.
George Edgar Dennes, F.L.S., &c., Secretary.
Francis Bossey, M.D.
William Maddox Chatterley.
Thomas Webb Greene, B.C.L., F.H.S.
Joseph Freeman.
Henry Ashton Meeson, M.D.
A. Gerard.
W. H. White, Sec., M.S.L.
James Forbes Young, M.D.
Æneas Mac Intyre, LL.D., F.L.S., V.P.M.S.L.
Edward Charlesworth, F.G.S.
S. Sly.
Robert Davis.
John Kernan.
James Rich.
J. S. Wilkinson, F.L.S.
George Rich.
C. F. Pollard.
W. F. Rock.
Mrs. Gawler.
Mrs. Dennison.
Miss Branfill.

Dec. 15. Arnold.

1837.

Jan. 5. William Dunkeley Paine.
William Frodsham.

Jan. 19. John Simon.

March 2. Edward Rogers.
James Dean.

March 16. R. E. Crawley,
Harvey Gem.
Charles Lingwood.

Digitized by Google

May 4. F. J. Staniforth.
Nov. 16. Thomas Sansom.
John Anderson, M.E.S.
George Cooper.

1838.

August 3. John George Children, V.P.R.S., F.L.S., H.M.C.P.S., &c., &c., Vice President.
John Green, M.M.S.
Nov. 2. William Ord, M.D.
Nov. 16. W. H. Willshire, M.D.

1839.

Jan, 4. W. H. Harton.
Feb. 1. Adam White, M.E.S.

III.—CORRESPONDING MEMBERS.

Elected previous to Thomas Bell Salter, M.D., F.L.S., F.B.S.E., Poole, Dorsetshire.
Nov. 1836. Miss Charlotte Perry, Stroud, near Haslemere, Surrey.
Dec. 15. Charles Conway, Pontnewydd, Monmouthshire.

1837.

Jan. 5. William Baxter, F.H.S., A.L.S., Botanic Garden, Oxford.
Jan. 19. Robert Ranking, F.L.S., Hastings, Sussex.
F. C. Lukis, Guernsey.
Feb. 2. Arthur Wallis, Chelmsford, Essex.
Feb. 16. James Seeley, Thames Ditton, Surrey.
March 16. Roberts Leyland, Halifax, Yorkshire.
July 6. James Buckman, Cheltenham.
Dec. 21. James A. Brewer, Reigate, Surrey.
Thomas Bodenham, Abbey Fore Gate, Shrewsbury.
Edwin Lees, F.L.S., F.B.S.E., Forthampton, near Tewkesbury.

1838.

March 2. Henry B. Fielding, F.L.S., Stodday Lodge, Lancaster.
R. J. N. Streeten, M.D., F.B.S.E., Worcester.

Digitized by Google

April 20.	M. J. F. Sidney, F.B.S.E., Cowpen, near Morpeth, Northumberland.
	J. W. Howell, M.R.C.S., Bath.
May 18.	J. Riley, Papplewick, near Nottingham.
	Daniel Stock, Bungay, Suffolk.
July 6.	J. Comfield, Cheltenham.
	Isaac Brown, Hitchin, Herts.
	Thomas Corder, A.L.S., Writtle, Essex.
Aug. 3.	M. H. Cowell, Faversham, Kent.
	John Knott, M.R.C.S., Adelaide Town, South Australia.
Sept. 7.	George Harvey Betts, M.R.C.S., Watford, Herts.
	Henry Martin Holman, Reigate, Surrey.
Oct. 5.	G. H. K. Thwaites, M.E.S., Bristol.
Nov. 2.	T. B. Hall, Coggeshall, Essex.
Nov. 16.	Miss Elizabeth Harvey, Deal, Kent.
	Harry Baber, F.B.S.E., Ely, Cambridgeshire.
	C. A. Stevens, F.B.S.E., Rochester, Kent.
	W. B. Lumb, M.R.C.S., Rochdale, Lancashire.
	Thomas Jones Dyke, M.R.C.S., Merthyr Tydvil, Glamorganshire.
Dec. 7.	T. G. R. Rylands, Bewsey House, Warrington.
1839.	
Jan. 4.	John J. Laughton, Kingston, Jamaica.
Feb. 1.	Henry Kingsley, Uxbridge, Middlesex.
Feb. 15.	F. J. White, F.L.S., F.B.S.E., Edinburgh.
	H. B. Harris, F.B.S.E., Edinburgh.

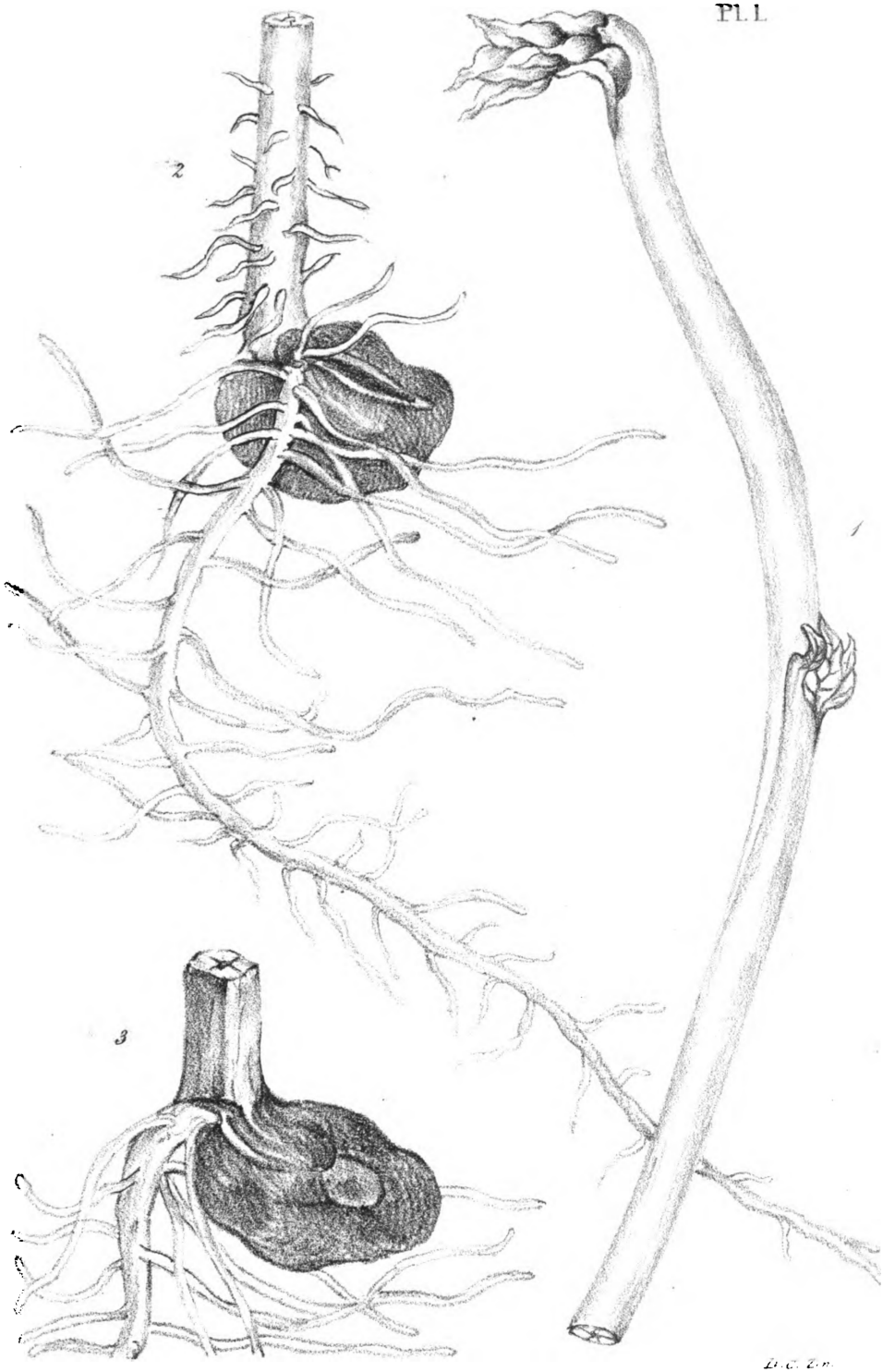
Digitized by Google



Digitized by Google

Effects of the absence of light on the Bean.

PL. L

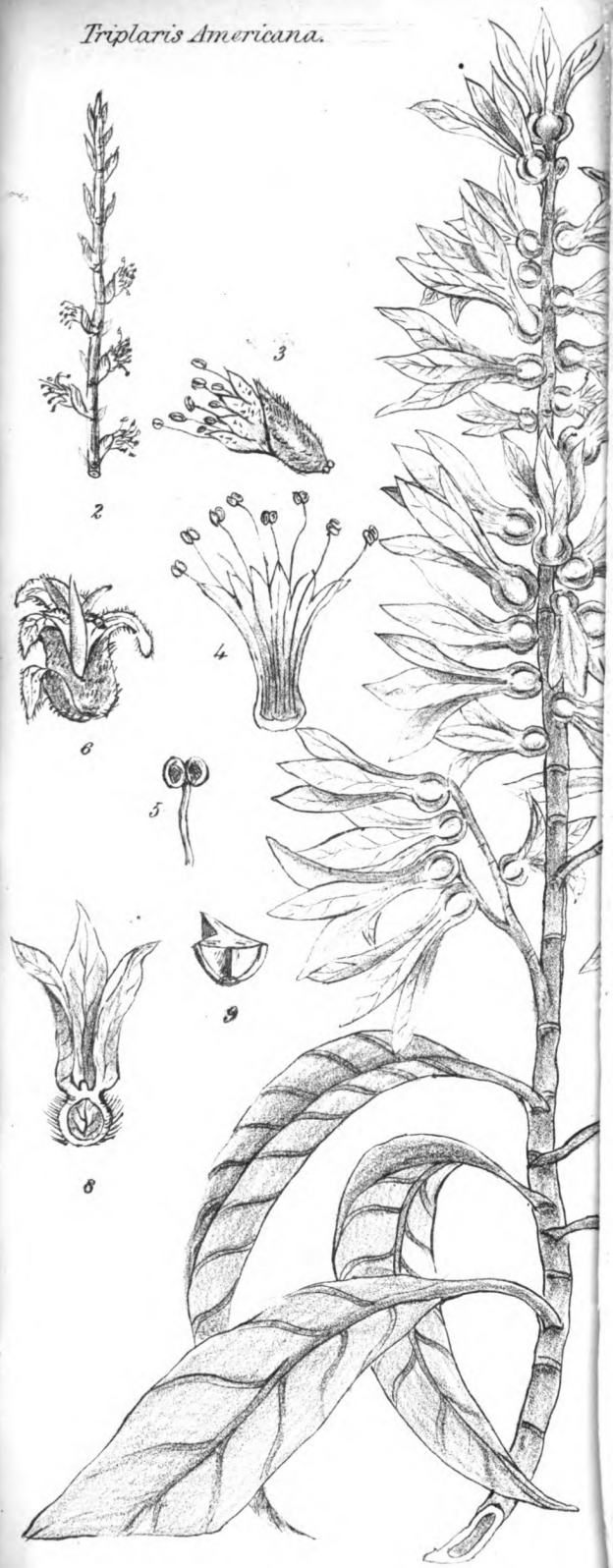


Digitized by Google

Digitized by Google

Triplaris Americana.

Pl. 4.





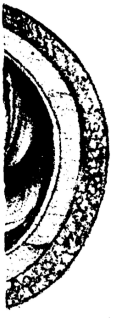
Linc.

Digitized by Google

Digitized by Google









Tune.

Digitized by Google

Digitized by Google

Bertholletia excelsa.

Pl. 4.

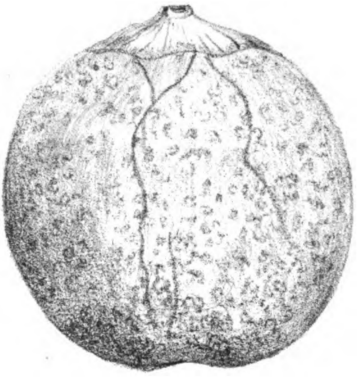
13



12



9



4



1



10.



5



2



7



3



8



11



6a



6b



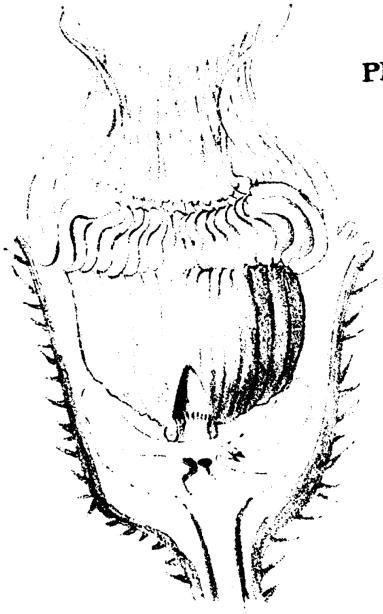
J. Reynolds. lith.

Digitized by Google

Digitized by Google



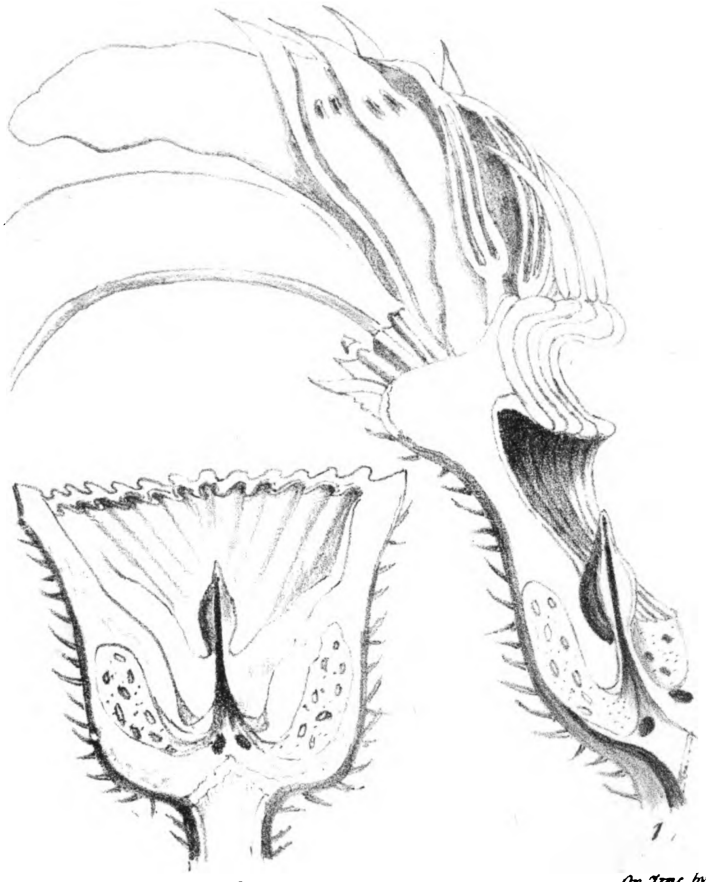
4



2



5



1.

3

Victoria Regia. Schomburgk.

Digitized by Google

A MANUAL OF BRITISH BOTANY,

In which the Orders and Genera are arranged and described according to the Natural System of DECANDOLLE, with a Series of Analytical Tables for the assistance of the Student in the examination of the plants indigenous to, or commonly cultivated in Great Britain. BY D. C. MACREIGHT, M.D., V.P., &c. London, 1837, John Churchill, Prince's Street, Soho. Price 7s. 6d., 12mo, neatly bound in cloth.

FLORA METROPOLITANA,

WITH SUPPLEMENT: or BOTANICAL RAMBLES WITHIN THIRTY MILES OF LONDON. By DANIEL COOPER, Lecturer on Botany, &c. London, 1837. Darton and Clark, Holborn Hill; S. Highley, Fleet Street. Price 6s. 12mo, neatly bound in cloth.

May be had Separate,

SUPPLEMENT TO THE FLORA METROPOLITANA,

Containing an Index of the English and Latin names, their time of flowering, colour of the flower, and heights in feet of the principal localities around the Metropolis; together with additional localities for 1836. Price 1s. 6d. sewed.

Printed for the Society.

A CATALOGUE OF THE BRITISH NATURAL ORDERS AND GENERA,

Arranged according to the SYSTEM OF DECANDOLLE, together with the LINNÆAN CLASSES AND ORDERS, intended to serve as labels for arranging British Collections, either according to the Natural or Artificial Systems. Longman and Co.; Machlachlan and Co. Price 1s each, on a double demy sheet.

By Subscription.

CONTRIBUTIONS TO A FLORA OF LIVERPOOL,

By T. B. HALL, Corr. Mem. Bot. Soc. Lond., and Local Secretary for Coggeshall, Essex, &c. Price 4s.

Subscribers' names received by Mr. G. White, 12, Hatton Garden, London.

Published on the first of every month, Vol. 3, New Series,

THE MAGAZINE OF NATURAL HISTORY,

Conducted by EDWARD CHARLESWORTH. F.G.S., &c., formerly by J. C. LOUDON, F.L.S. London, Longman and Co., Paternoster Row. Price 2s.

N.B.—Volumes 1 and 2 of the New Series may be had of the Publishers.

Digitized by Google

A FLORAL GUIDE FOR EAST KENT, &c.

Being a record of the habitats of Indigenous Plants found in the Eastern division of the County of Kent, with those of Faversham minutely detailed, and definitely exhibited; together with brief remarks on the uses of the several Species in Domestic Economy, Agriculture, Medicine, and Manufactures; deduced from various authorities. Illustrated by Two Maps. By M. H. Cowell, Corresponding Member of the Botanical Society of London, and Local Secretary for Faversham. Price 5s. Fine Paper, 8vo, Boards.

On the First of every month,

FIGURES AND DESCRIPTIONS OF THE GENERA OF BRITISH FLOWERING PLANTS,

By W. Baxter, F.H.S., A.L.S., &c., Curator of the Botanic Garden, Oxford, aud Local Secretary for Oxford. Price 1s. 6d. coloured, 1s. plain.

The First and Second Volume, Price £1 1s, coloured, or 10s. 6d. plain.

Vol. 3, 8vo, cloth, with 80 coloured plates, £1 11s. 6d., or with plain plates, £1 1s. Whitaker and Co., London.

THE LITTLE BOOK OF BOTANY,

Or, FAMILIAR EXPOSITION OF BOTANICAL SCIENCE, simplified and written expressly for Young Botanists. With Plates. By Daniel Cooper, Lecturer on Botany, &c. Darton and Clark, Holborn Hill. Price 1s. 6d. cloth.

Also, by Subscription only;

ACTUAL SPECIMENS OF MOST OF THE BRITISH LAND AND FRESH WATER SHELLS,

(100 in number.)

Arranged in a Book Box, the size of an 8vo. volume, with seven shelves, bound, lettered, &c., with a Catalogue, forming a neat and interesting collection. Price £2 2s.

Subscribers' names received by Mr. D. Cooper, 82, Blackfriars Road, London.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google


Digitized by Google