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LECTURES

ON VARIOUS SUBJECTS,

AS DELIVERED

IN THE

BOTANIC GARDEN

AT

LAMBETH.

BY THE LATE

WILLIAM CURTIS, F.L.S.

DEMONSTRATOR OF BOTANY TO THE COMPANY OF APOTHECARIES;

AUTHOR OF

THE BOTANICAL MAGAZINE,

AND OF THE

FLORA LONDINENSIS,

&c. &c.

ARRANGED FROM THE MANUSCRIPTS IN THE POSSESSION OF HIS SON-IN-LAW,
SAMUEL CURTIS, FLORIST, WALWORTH.

VOL. III.

LONDON:

PRINTED FOR H. D. SYMONDS, 20, PATERNOSTER ROW;

AND

CURTIS, 3, ST. GEORGE'S CRESCENT,
ST. GEORGE'S FIELDS.

1805.

*Knight and Compton, Printers,
Cloth Fair.*

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PRACTICAL OBSERVATIONS

ON THE

BRITISH GRASSES;

Containing accurate Figures of the most approved Grasses for Meadow and Pasture Land; Hints for the Improvement and laying down of Land to the best Advantage: accompanied with a Descriptive Catalogue of all the British Grasses.

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BY SIR JOSEPH BANKS, BART.

SECTION I.

Lecture on Grasses.

THE Plants, whose structure we are to explain to you in this Lecture, are the Grasses strictly so called, not according to the extensive meaning of that word as used by farmers and others, who most unscientifically call narrow-leaved Plantain, many of the Trefoils, and indeed almost all Plants which are eaten by cattle, by the general appellation of grass. But we mean by Grasses, such plants as have a hollow-jointed stem, whose flowers for the most part have three stamina, and two feathery styles, included between chaffy husks, instead of that kind of Corolla which is common to most Flowers.

This definition not only separates the

Grasses from the Clovers, but from the Rushes, Carices, &c. which are very nearly related to them, and hence called by Botanists *Graminibus Affines*.

It is no uncommon thing for mankind to be more attracted by shew than substance, preferring gaudy trifles to objects of great utility. As the Grasses cannot boast the brilliant colours of the Tulip, or Auricula, they have few charms for such as have a taste for Flowers, not but that many English, and more Foreign ones, possess a considerable share of beauty. The different tints of green which a collection of them exhibits in the month of May, especially if gently agitated by the wind, cannot be observed, without exciting the most pleasing sensations. And the fine-leaved Fescue, the glaucous Elymus, the trembling Briza, the majestic Broom-Grass, the waving Stipa, the fine paniced Bent, and the variegated Phalaris, have charms sufficient to rivet the attention of the most indifferent

beholder. But if a person more curious than his neighbours be disposed to extend his botanical researches beyond the Flowers of the garden, and, from an idea of the great utility of the Grasses, be induced to attempt an investigation of them, he finds himself bewildered in such a labyrinth of difficulties, that he is quickly induced to give up the pursuit.

This difficulty appears to us to arise from the smallness of the parts of Frućtification in Grasses; and the great similarity there appears to exist, at first sight, between most of the species; but this apparent similarity will vanish, when you are made acquainted with the several parts of which they are composed.

The Roots of Grasses are chiefly annual or perennial; very few of them biennial; out of one hundred and seven Species which are found wild in this Country, only twenty-six are annual, and of the remaining perennial ones, there are sixteen that have strong creep-

ing Roots, similar to the *Triticum Repens*, or Couch Grass.

Grasses propagate themselves in different ways, viz.

1st. By Seed, as in the *Aira præcox*, *Poa rigida*, *Alopecurus agrestis*, and others; these indeed, being strictly annuals, cannot propagate themselves in any other way: most of the perennial Grasses are also increased by their Seeds. Grasses growing in mountainous situations are apt to become viviparous, in which case the Panicle or Spike instead of producing Seed, throws out new shoots or young plants, which by their own weight fall to the ground, and there each shoot takes Root, and answers the purpose of a Seed.

2d. Grasses growing upright, or nearly so, are increased by roots sent forth from the base of the stalk, as in *Poa annua*, *Festuca pratensis*, and several others both annual and perennial: this kind of increase is, by the farmers, called Tillering; and as this dispo-

sition of the Grass to throw out fresh roots, is increased by its lying close to the ground, it is evident that rolling as producing that effect must, in certain cases, be highly beneficial, particularly after long continued frosts, by which the soil is become loose, and the roots almost thrown out of the ground.

3d. There are several Grasses whose stems lie flat on the ground, and send forth a root from each joint, as on the *Agrostis alba*, or Marsh Bent-Grass.

4th. Grasses are increased, and that too in a most plentiful manner, by means of creeping roots, as in the Couch-Grass, Red Smooth Stalked Meadow-Grass, and many others; such then are the several modes in which the Grasses are usually propagated.

The stalk which produces the fructification, and which in other plants is known by the name of *Caulis*, in Grasses takes the name of *Culmus* or Straw. This, as in other plants, varies considerably in its appearance with

regard to its direction, shape, smoothness, and other circumstances.

When growing upright, as in Wheat, Meadow Foxtail, and the generality of Grasses, it is called *Erectus.*

When growing obliquely, as in *Poa annua* and *Festuca decumbens*, it is called *Obliquus.*

When running on the ground, and sending forth roots at the joints, as in *Agrostis alba* *Repens.*

When irregularly bent, as in *Alopecurus geniculatus* *Infractus.*

When perfectly round, as in most Grasses *Teres.*

When flattened on both sides, as in *Poa compressa* *Compressus.*

* When perfectly smooth, as in *Poa pratensis* *Lævis.*

When feeling manifestly rough to the touch, as in *Poa trivialis* *Scaber.*

When covered with soft woolly hairs, as in *Holcus lanatus* . *Tomentosus.*

When covered with large rough hairs, as in *Bromus hirsutus* *Hirsutus.*

We may remark, however, that, in general, when we speak of *Culmus lævis*, *hirsutus*, and so on, we generally mean it as covered by the sheaths of the leaves, not denuded.

The stalk is always furnished with knots or joints, which are more or less numerous, and these in general are smooth, but in some few instances are woolly, and hence afford a good specific character: thus the *Holcus mollis* is distinguished from the *Lanatus*, by the woolly joints of the latter.

Grasses, like other plants, are furnished with leaves, which though they have not that variety of shape which we find among other tribes, have a certain peculiarity of structure which they do not possess. The lower part of the leaf forms a sheath, which closely surrounds the *Culmus* in most plants,

but in some is swelled or inflated, as in the *Alopecurus*; it has a suture on one side of it, which in some instances is straight, in others oblique. The upper part of the leaf is usually flat and spreading, and most commonly when it separates from the sheath, is furnished with a membrane sometimes long, sometimes short, sometimes obtuse, sometimes pointed.

This membrane is frequently of the greatest service in distinguishing different species; its utility in this respect is admirably exemplified in the *Poa pratensis* and *trivialis*.* The base of the leaf frequently runs out into two little appendages, which sometimes embrace the stalk, and serve also in some few instances to discriminate the species, as in *Bromus giganteus*.

The leaf like the stalk, may vary in its direction, its shape, its colour, its smoothness, and a variety of other particulars not necessary now to enumerate.

The fructification of the grasses is most

* See ANNALS OF BOTANY.

commonly disposed either in a panicle or spike. When the flowers are placed on footstalks which branch several ways, we call it a panícula or panicle, and when these spread out in every direction, as in the *Poa pratensis*, we call it a panícula diffusa; when they close together, as in the *Avena clatior*, it is called a panícula coarctata; when the flowers grow on very short footstalks, so as to have no appearance of being branched, it is called a spica or spike, as in the *Alopecurus pratensis*. The filiform receptacle to which the flowers are fixed, and which remains on stripping them off, is called the Rachis. The flowers of grasses seldom grow singly, but for the most part several are contained within one common calyx; this particular kind of inflorescence is called a spicula, and is named according to the number of florets which compose it; when it contains one only as in the genus *Agrostis*, it is called uniflora; when two, as in *Aira biflora*, and when many, multiflora, as in most of the grasses.

This circumstance of the number of flowers in each spicula is often of considerable consequence in forming both the generic and specific character of many Grasses, but as founded on a number is a character not too much to be depended on. Now a single flower, or blossom of a Grass usually consists of four greenish husks; the two lowermost and outermost of which are considered as the calyx; the two uppermost and innermost, though differing very inconsiderably from the others, yet containing and being next to the fructification as the Corolla. You are particularly to observe, that if the spicula consists of two, three, or many flowers, the calyx is only the two lowermost husks which contain no stamina or pistillum, but serve only to support the others which do that are called the Calyx. Gluma is the term by which the calyx is usually called, and as the husks which constitute the calyx are sometimes called valves, so also are those of the corolla; thus we say in speaking of

the calyx—Gluma univalvis, bivalvis, or Corolla univalvis, bivalvis, &c.

Though most of the Grasses have a calyx of two valves, the Genus *Lolium* is distinguished by having one, and though most of the Grasses have a Corolla also of two valves, yet the *Alopecurus* is distinguished by having only one. Sometimes one or both of the valves of the Calyx, but more frequently those of the Corolla, are furnished with an *Arista*, *Awn*, or *Beard*, which is often of considerable consequence in forming the genus;—thus when it springs from the back of the valve of the Corolla, it forms the Genus *Avena*; when it issues from near its point, the Genus *Bromus*; when unusually long, it constitutes the Genus *Stipa*. This Awn, or Beard, is frequently much twisted, and often bent horizontally; and as it is affected by the moisture or dryness of the weather, hygrometers are usually made of it. In general each flower contains three long slender

filaments, having an oblong anthera at each extremity, which usually appear forked on shedding the pollen; the *Anthoxanthum* however has only two *stamina*.

The *Pistillum* consists of a germen and two feathery styles, sometimes long and slender at the base, but more commonly short and branched to the bottom; a very pretty microscopic object.

At the base of the germen we may observe in most Grasses by the assistance of a magnifier, two small upright membranous substances of a white colour, and very delicate, usually tapering to a point; these are considered as the nectaria of the Grasses, and are differently formed in different species; and though they are very minute, will frequently be found serviceable in distinguishing the species.

The Grasses have in general no other seed-vessels than what is afforded them by the valves of the Corolla. In the *Anthoxanthum*

the nectarium which is composed of two valves, finally closes, and covers the seed; in some Grasses these valves or husks, become so closely connected to the seed, as scarcely to be separated from it; in others, the seeds lie loosely between them, and easily drop out; this is exemplified in wheat and barley, in the former the valves of the Corolla do not adhere to the seed; in the latter they do.

We have now endeavoured to give you a general idea of the structure of the Grasses, the observations on the advantages which may result from introducing more generally some of the better kinds for agricultural purposes; and what those kinds are, you will find, together with a complete catalogue of the English Grasses, (in a Work entitled, *Practical Observations on the British Grasses.* By *W. Curtis.*)

H I N T S

RELATIVE TO THE

IMPROVEMENT OF PASTURE LAND.

WHEN we daily see the important advantages resulting to the community from the introduction of Wheat, Barley, Oats, Rye, Vetches, Clovers, Saintfoin, Trefoil, &c. many of which are natives of our own country; when such pains and expense are bestowed on arable lands, it seems strange that so little care should be taken for the improvement of our Meadows and Pastures. Ten thousand acres of which, or rather ten times that number, in this, and most other countries might be made to produce double or treble the crops they already do by the judicious introduction of suitable grasses.

If we examine our Meadows and Pastures,

we shall find them pretty much in a state of nature, except it be those which within these few years have been laid down with Rye Grass, and Dutch Clover, full of an indiscriminate mixture of plants, some of which may afford good, others bad food; some good crops, others scarce any crops at all. It must be allowed that there is naturally a considerable difference in them; one meadow or tract of land shall, from some particular circumstances, contain a greater number of good grasses than another; another shall be little more than a mixture of unprofitable weeds, growing in it originally, such as crowfoots, docks, thistles, nettles, sorrel, knapweed, ragwort, &c. most of which having strong perennial or creeping roots, continue in the ground, impoverish it, and overrun the good grasses, so that such a crop is scarcely of any value. If the ground be manured, the unprofitable and noxious plants are thereby benefited as well as the grasses; for it would

be the extremity of folly to suppose that manure shall produce good plants, if the seeds or roots of them were not in the ground before. It must be allowed, that if there be any strong growing grasses, by thus becoming stronger, they may overrun and destroy some annual plants, but not those just mentioned, which, instead of being destroyed, will receive additional vigour.

But it is not these kinds of weeds, perhaps, which are the most mischievous, these being visible and cognizable by the intelligent farmer may be destroyed; but at the same time the ground may be overrun with bad grasses, which not being so easily distinguished, cannot be so easily destroyed. Grasses may be considered as bad on several accounts; they may, though good in themselves, produce so small a crop as not to deserve cultivation, as the sheep's fescue grass.

They may either, from their roughness, bad taste, or some pernicious quality, be such as

cattle will either reject or be injured by eating them, as the Wall Barley Grass; they may be apt to die on the ground, and give the meadow a dead disagreeable aspect in the winter, as the Agrostis tribe, or they may blow late in the summer, and be not fit for mowing till most of the good grasses are decayed and gone off, and thus may a meadow or pasture be filled with weeds as effectually as if they were more obviously so.

Surely then it must be worth the farmer's while to be at some pains and the same expence in laying down meadow land, as he would in sowing a piece of wheat, and the more so indeed, as when once filled with good and suitable grasses, it continues a good meadow or pasture always; a meadow which will ever look pleasing, and if properly manured, and the season prove not remarkably unfavourable, shall never fail to produce a plentiful crop.

The grasses, we would recommend for this purpose, are the †

Festuca pratensis

Alopecurus pratensis

Poa pratensis

Poa trivialis

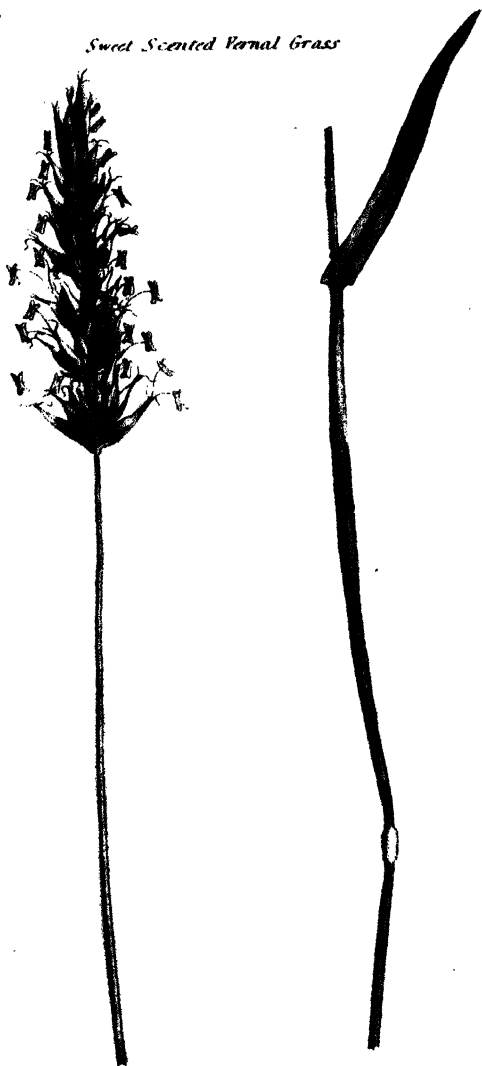
Cynofurus cristatus

Anthoxanthum odoratum.

From observation and long continued culture, we are certain that these are six of the best. We are not certain that a meadow would be improved by having a greater number of grasses. To these should be added some Dutch and Broad-leaved Clover.

Plate 1

Sweet Scented Vernal Grass



Pub. by S. Curtis

PLATE I.

ON GRASSES.

Fig. 1.—Representing the general habit of the *Anthoxanthum Odoratum*, or Sweet-scented Vernal Grass; one of the most useful Grasses in cultivation for an early crop, and the principal Grass which gives that agreeable scent to the best hay.

Plate 2

Meadow Fox Tail Grass

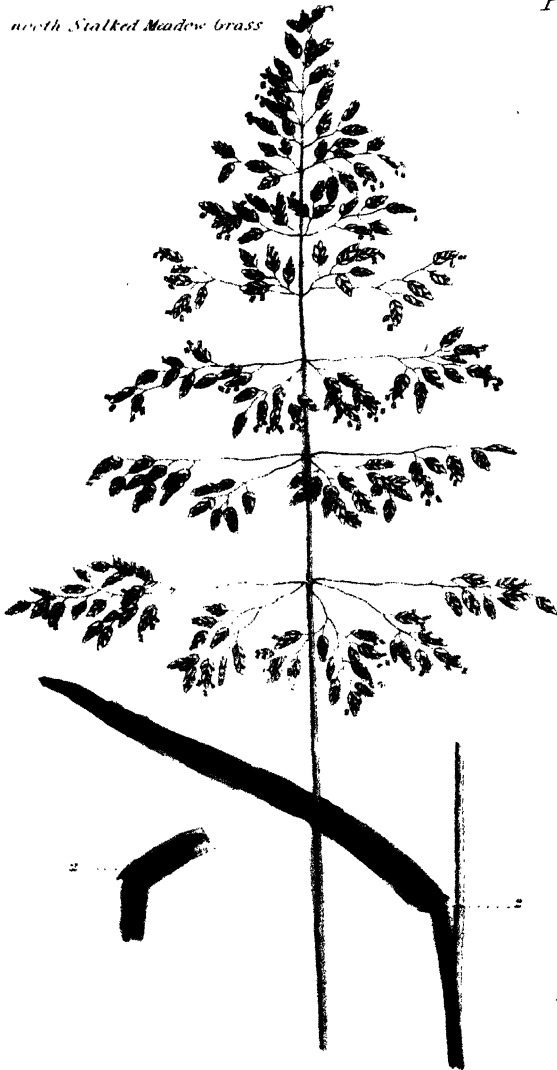


PLATE II.

ON GRASSES.

fig. 1.—*Alopecurus Pratensis*, or Meadow Fox-tail Grass; being one of the six sorts of Grasses the Author recommended in a pamphlet for the improvement of meadow and pasture land. It is an early and very useful Grass.

North Stalked Meadow Grass



Del. by Scortch. Fil. et. Wilson. & May 1857

PLATE III.
ON GRASSES.

ig. 1. — *Poa Pratensis*, or Smooth-stalked Meadow Grass, is an early Grass for pasturage, and strongly recommended by the Author; *vide* Practical Observations on the British Grasses, page 9.

Tough-Stalked Meadow Grass

Plate 4



PLATE IV.

ON GRASSES.

Fig. 1.—*Poa Trivialis*, or Rough-stalked Meadow Grass, one of the Grasses recommended by the Author for an abundant crop.

Plate 5

Meadow Fescue Grass

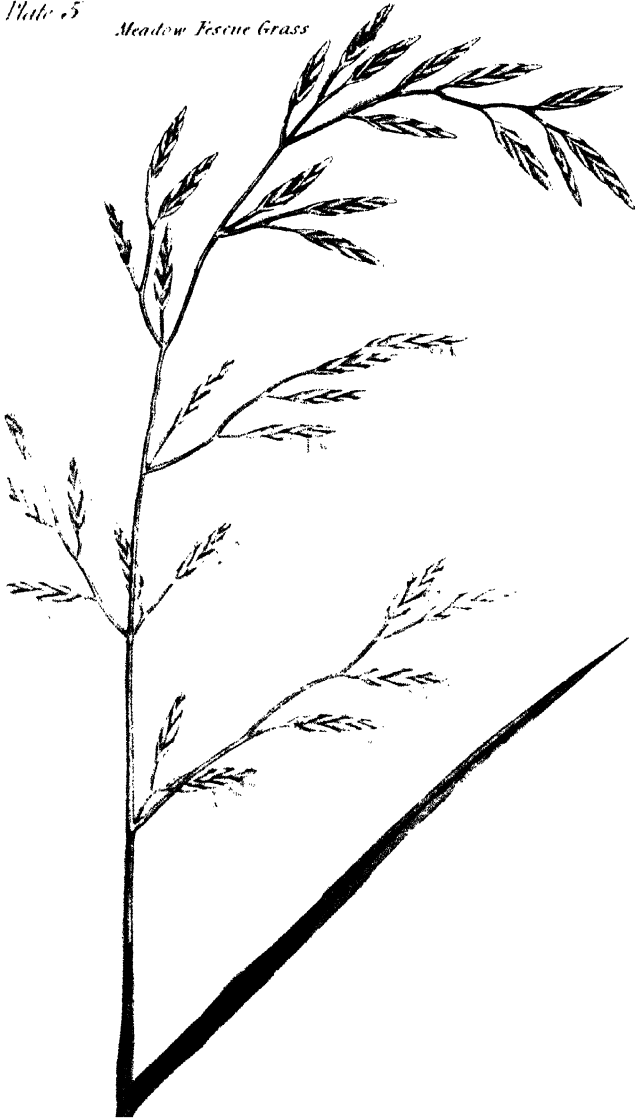


PLATE V.

ON GRASSES.

Fig. 1 — *Festuca Pratensis*, or Meadow Fescue Grass; one of the sorts recommended by the Author for the improvement of pastures.

Plate 6.

Crested Dog's Tail Grass

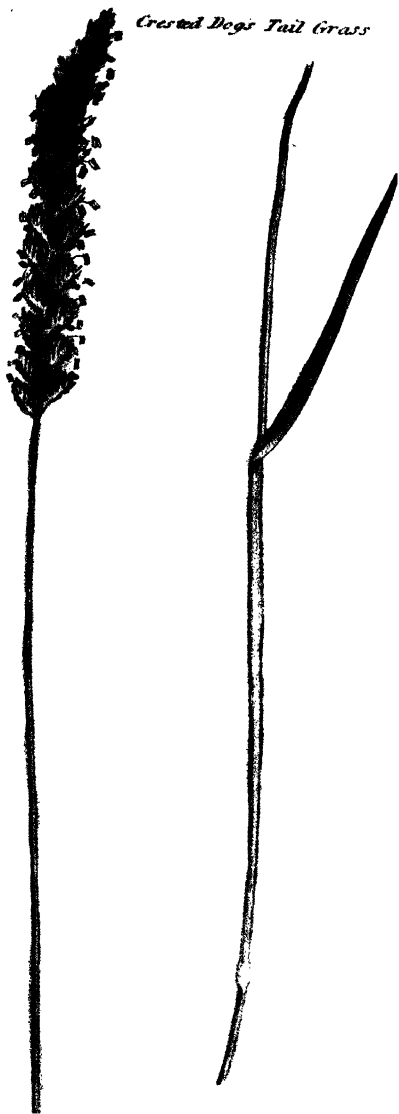


PLATE VI.

ON GRASSES.

Fig. 1.—*Cynofurus Cristatus*, or Crested Dog's-tail
Grass; one of the sorts recommended by the Author.
It is chiefly valued on account of its affording a
favorite and wholesome food for sheep.

7

Rough Cocks-foot Grass.



PLATE VII.

ON GRASSES

Fig. 1.—*Dactylis Glomerata*, or Rough Cock's-foot
Grass; a sort which has been strongly recommended
for a large crop. It appears to be a coarse Grass,
fitter for early grazing than making into hay.

Fig. 1

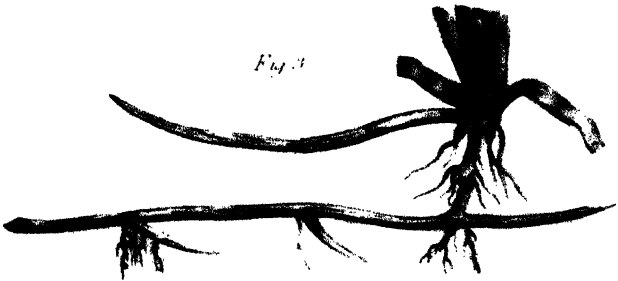
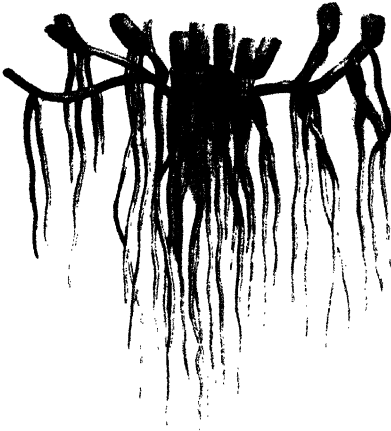


PLATE VIII.

ON GRASSES.

ig. 1.—Tillering; a mode of propagation in Grasses, wherein the bottoms of the stalks send forth fibres, and by that means increase much in extent without dividing.

ig. 2.—A mode of increase in the Grasses from a creeping stalk, wherein it sends forth fibres from each joint.

ig. 3.—A mode of increase in the Grasses from a creeping root, which puts forth shoots at unequal distances.

SECTION II.

HAVING in a former Lecture endeavoured to give you a general idea of the structure and economy of roots, and shown you the different kinds into which they are divided by Botanists, we propose in this to give you some idea of the Stalk, and of the operations of Grafting and Budding performed on it.

Observing persons must have noticed that when two trees or their branches have grown so as to intersect and come in contact with each other, a perfect union has in time taken place betwixt them.

Such natural junctions betwixt trees are by no means uncommon in woods and hedges,

and are particularly apt to take place in the Horn-beam.

These, perhaps, might originally afford a hint for attempts to make one tree grow on another, as is the case in Grafting. However this may be, the practice of Grafting, of which we shall attempt to give you some idea, is of very ancient date, most of the modes now in use are described by Pliny.

By the word *Instio*, the ancients meant the insertion either of a bud or branch of one tree into another; this term included both Grafting and Budding, but according as the one or other of these methods is practised, we use a different term. If a branch of one tree be inserted into another, we call it Grafting; if a bud only, Budding or Inoculating.

The operation then of Grafting or Budding, is when a small branch or a bud taken from one tree, by a dextrous application of it to the trunk or branch of another, unites and

coalesces with it in such a manner that both become one.

Grafting and Budding are the same in principle, the bud being a young shoot or small branch in embryo.

These operations are practised chiefly for the purpose of encreasing merely, and that with certainty, some accidental variety of fruit, flower, or foliage, either raised purposely from seeds, or accidentally discovered.

Trees or shrubs with variegated foliage, are frequently found wild by accident, and sometimes, though more rarely, with double flowers, and now and then with fruit, improved either in size or flavour. Whenever such trees or shrubs are discovered, they are considered as fit objects to be multiplied by grafting, for they are merely multiplied, not meliorated, by such a process.

The body of the tree growing in the earth, and which is generally one in its wild state, we call the stock, and the cutting shoot, or

small branch which we insert, or graft upon the stock, we call the Cion or Graft.

Though a perfect union, and of course, circulation, takes place between the stock and the graft, the qualities of each never alter; the peculiar stamina of each remain unchanged. If a wilding be grafted on an improved stock, it becomes in no respect improved, and vice versa. A common mode of obtaining improved fruits, is to sow large quantities of the seeds of some good fruit, when amongst a vast number of seedlings one or more may chance to turn out valuable, perhaps better than its parent stock.

In all kinds of grafting whatever, the liber or inner bark of the stock, and that of the graft, must come in immediate contact; this is the grand principle on which the success of grafting depends; it is almost of equal importance that the graft or cion be young; that it be part of a one, or at most a two years shoot. In grafting we must be equally attentive to

another circumstance ; the stock and the cion must be of the same genus or family, or at least of the same natural class, for the nearer the relationship, the greater success in grafting. But nature allows of large liberties in this respect ; we may graft Apples upon Pears, or Pears upon Apples, and both these on the common White Thorn, upon which we may likewise graft Medlars and Services, and upon the Pear grafts we may also engraft the Quince. All these may be made to grow on one tree by the different kinds of grafting. So the pruniferous fruits, such as Peaches, Nectarines, Apricots, Cherries of all sorts, as well as Plums, may be budded on Plums.

Bradley mentions it as something extraordinary that the *Lauro Cerasus*, which is our Common Laurel, and an Evergreen, should take on the Cherry and Plum, and be made a companion for all these of the pruniferous race : he was not aware that the *Lauro Cerasus* was no other than a *Prunus*. Instances

are related of the operations succeeding with trees of different genera, and even classes, as the Oak and Birch, Willow and Apple. Different succulent plants may also be grafted on each other with success; an ingenious operator may exhibit many pretty fancies in this way, to the no small amusement of himself and friends.

After we have applied or inserted the graft into the stock, (the different modes of doing which we shall presently shew you) we secure it in its proper place, for it is of as much consequence that they be not disjointed, as the bones in a broken limb, while a callus is forming. This is done first by a proper bandage of wet bals, the common string of gardeners, and the joint afterwards thickly covered with a mixture of clay and horse-dung, which when finished forms a lump of an oval form; this not only tends to keep the graft and the stock united, but imparts a moisture which is considered as beneficial,

and preserves them from the effects of frost, which sometimes destroys the graft.

A mixture of wax, rosin, &c. has been recommended by some, but the nurserymen, who must be allowed to be the best judges of these matters, but rarely or never use it.

We shall now attempt to shew you the several different ways of performing the operation of Grafting; the first we shall describe is,

Whip Grafting.

This is the most simple kind of grafting, requiring nothing more in the operation than that the extremity of the stock and the graft be cut off obliquely, so as to correspond with each other when applied; but from the difficulty of keeping the barks of the stock and the graft in close union, this method is very rarely practised, and has generally given way to Tongue grafting.

2d, Tongue Grafting,

Is the most practised of all the kinds, being found to be the most successful and least troublesome. To succeed in this, first perform the operation as for Whip Grafting, cutting off the tip of the sloped end of the stock, then with a knife make a slip parallel with the slope in the middle of the stock downwards, and a similar one in the graft upwards; by these slips two tongues are formed, which being inserted into the slits, the graft is pushed close on the stock, taking care that the rinds, on one side at least, closely meet.

This is clearly nothing more than Whip Grafting, with the improvement of the tongues, and which indeed is a great improvement, as it serves admirably to keep the graft and stock united.

Care must be taken that the graft be not in the least displaced in the application of the clay.

3d, *Cleft Grafting.*

Cleft grafting is chiefly used when Tongue grafting is not so applicable; as when the stocks are large, and you are desirous of obtaining a tree speedily.

It is performed by cutting off the head of the stock, first obliquely, then the sloped part horizontally, so that the horizontal surface shall be half the size of the whole surface of the stock; then with a knife make a slit on the middle of the crown downwards, in a contrary direction to the sloped part, which is to be kept open by inserting the knife or a small wedge. The stock being thus prepared, the graft to be inserted, first has its extremity for about an inch and half, cut into the form of a wedge, the knife is then carried in a circular direction round three parts of the stock at the base of the wedge, for the rind on one side must not be cut through. The intent of this circular incision is to form a shoulder on each side of the tongue, which

the wedge is now to be shaped into, and which must be left about the eighth of an inch thick more or less on the outer barked side, bringing it to an edge on the inside.

The graft thus prepared is to be let into the slit in the stock, when the knife being withdrawn, the stock closes on the graft and keeps it firm.

4th, *Rind Grafting,*

By some called *Crown Grafting*, is performed by inserting several grafts round the crown of a stalk, betwixt the wood and the rind, and is calculated for such large stocks as are too big and stubborn to cleave, or to perform upon large branches of Apple or Pear trees; when it is intended to renew the head on any particular branches thereof, and is performed in the following manner.

Cut off the head of the stock horizontally; a stock will usually sustain four grafts; thrust an ivory bodkin down betwixt the bark and

the wood, in four different places, so as to make a separation for the reception of the grafts. To prepare the graft, cut it within about an inch and a half of its extremity, circularly through the rind, not deeper than the rind on one side, but half way through, or just beyond the pith on the other; then carry the knife to the middle of the extremity of the graft, and split it up, so as to leave about one third of the end of the graft, which must be pointed, and sloped a little to the point on the outside, but the inside, which comes in contact with the wood of the stock when inserted, must be left straight. The grafts are then inserted into the openings made by the bodkin.

5th, *Saddle Grafting,*

Is chiefly practised in the grafting of oranges, for which purpose it is found to have advantages superior to other modes.

It is performed by cutting the top of the

stock into a wedge-like form, and making a corresponding notch in the end of the graft to receive it.

6th, Shoulder Grafting,

By some called *Cheek Grafting*, is somewhat like Whip or Splice grafting, is chiefly used as a matter of curiosity, and is thus performed; cut off the head of the stock first horizontally, then slope off one side of it, sloping the graft in the same manner with a shoulder at top, apply it to the stock, resting the shoulder on the crown of it, rind to rind, at each edge.

7th, Terebration,

Is said to be the oldest method of grafting, but is now in disuse. Performed thus—the head of the stalk is to be cut off horizontally, and a hole bored in the center of it; the graft, which must be of the same thickness, has a circular incision cut round it, within about an inch and a half of its extremity, and

the wood cut away, so as to leave only a peg in the center, of a size adapted to the hole bored in the stock; the graft is then applied by inserting the peg into the hole of the stock, and the graft and stock being of the same size, the barks come in contact and readily unite; but as grafts seldom correspond in size with the stock, this mode can rarely be practised.

8th, *Side Grafting,*

Is performed by inserting a graft into the side of a branch or body of a stock without heading, and is practised occasionally to fill any vacancies in the lower part of old fruit-bearing trees, or to produce a variety of fruits on a tree.

To perform it, fix on any small branches, slope off the bark and a little of the wood, an inch and a half or two inches; cut a slit downward, then cut the graft to fit the parts, with a tongue for the slit in the branch; join it thereto, tie them close, and clay them over.

9th, *Root Grafting,*

Practised sometimes by way of experiment, or out of curiosity. To perform it, cut off a piece of a root of a tree that has good fibres, insert a graft on it by shoulder grafting, or any other mode, place it thus grafted within the earth, just above the joint, with the top of the graft above ground. The root will grow and the graft take.

Many valuable trees and shrubs, which are with difficulty propagated by any of the modes of grafting, will readily grow from cuttings of the roots properly treated.

10th, *Grafting by Approach.*

This species is only applied to such trees as do not succeed in the common modes of grafting, such as the *Arbutus*, *Andrachne*, &c. some cases of this sort it is an operation of great consequence.

It is performed chiefly by planting the stock in a pot, and placing it so near the tree or shrub, that one of them may be united by tongue-grafting. If the branches are too high for the length of the stalk, the pot must be elevated, or may be tied on the tree if stout enough to bear it.

Inarching,

Is an operation performed for the purpose of uniting two or more trees or shrubs while growing in the earth ; it differs from grafting and budding in this, that it is performed on two trees or shrubs either growing in the earth near each other, or if in pots, brought together, so that their branches may come in contact ; they are then to be united by tongue-grafting, or any other mode that may be preferred. It is customary to fasten the branch of each tree to a pole purposely erected, to prevent their being shaken by the wind, which would be apt to prevent their

union. Such then are the several different kinds of grafting more or less in use ; we proceed now to the operation of Budding or Inoculating.

Budding or Inoculating.

We before observed to you that budding or inoculating depended on the same principle as grafting : that the only difference betwixt a bud and a graft was, that the bud was a shoot in embryo ; in budding, the union takes place betwixt the barks exactly as it does in grafting.

Budding is preferred to grafting in several cases ; many trees do not readily succeed by grafting, especially such as distil a gummy substance, as Apricots, Nectarines, Peaches, Plums, and Cherries ; though the two latter are frequently grafted. Grafting, where it will succeed, is always to be preferred, as grafts produce fruit generally two years sooner than buds.

To perform the operation of Budding, we are first to select a proper stock, with its head on, (which if the budding succeed is to be cut off the ensuing spring) then on some smooth part of it we begin by making a transverse incision through the bark down to the wood; from this, with the point of the knife, we make a longitudinal one downwards, about an inch and a half long, so that the incision shall resemble the letter T; we then with the handle of the budding knife raise the bark a little on each side of the longitudinal incision; it is then fitted for the reception of the bud. The buds to be inserted are taken from shoots of a year's growth, those about the middle of the shoot are to be preferred, as those from the top or bottom of the shoot seldom produce good fruit-bearing trees, being very apt to run too much to wood. Having fixed on a proper bud, insert the knife about half an inch above it, cut off a thin slice of the bark and wood, bringing the knife out about an

inch and a half below the bud; the slice thus cut off with the bud on it is called a bud. If the part below the bud happens to be cut off too long, it is to be shortened, we then cut off the leaf, leaving the stalk of it about half an inch long. Before the bud is fit for insertion, we must take the wood out of it, which is done in this manner, with the thumb and forefinger of the left hand, we hold the very extremity of the bud, which has the shortest tail by the bark, while with the thumb and forefinger of the right hand, we strip the wood out of it by pulling it downwards; if this be properly performed, no wood is left except in the eye of the bud, which should appear full; if as it sometimes happens in this operation, too much of the wood be pulled out of the bud, a hole will be visible, and such buds are spoiled; this last accident will generally happen, if the wood be pulled upwards instead of downwards; the tail or lower part of the bud is now to

Fig 1



Fig 4

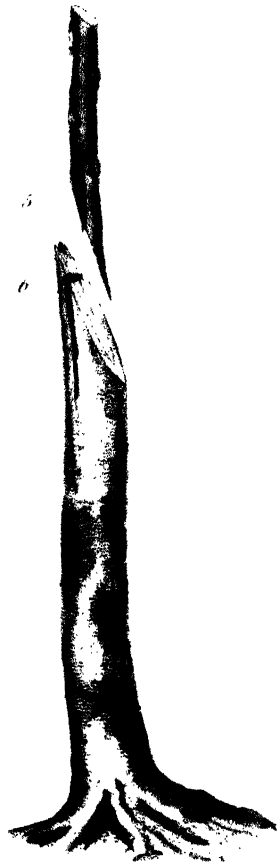


PLATE IX.

ON GRAFTING.

g. 1.—Whip Grafting, the most simple kind of grafting, consisting principally in keeping the barks of the stock and graft in contact, after cutting them off obliquely, as at 2 and 3.

ig. 4.—Tongue Grafting; the most common kind of grafting now in use, consisting of the same process as for Whip Grafting, with the addition of a slit corresponding in both, so as to form a tongue in the graft, which is pushed into the slit in the stock, thereby holding it firm with the rinds of both connected, in which manner it is secured, vide 5 and 6.

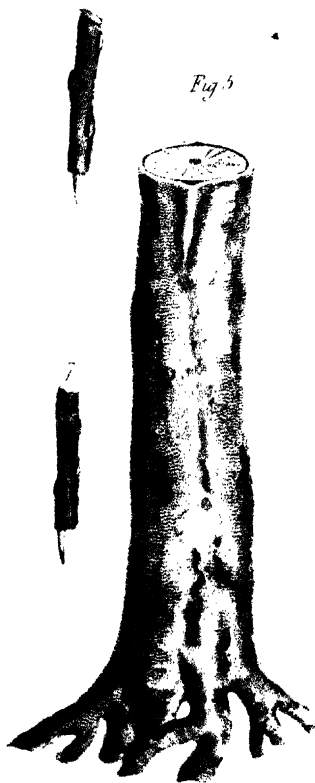
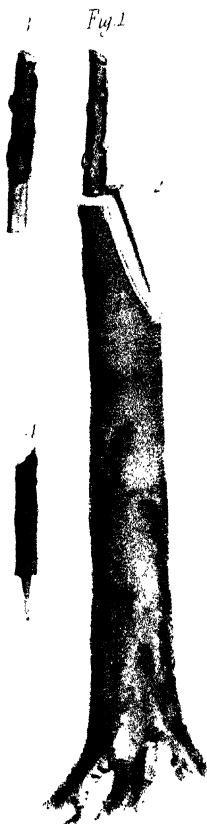


PLATE X.

ON GRAFTING.

Fig. 1.—Cleft Grafting is chiefly used when Tongue Grafting is not so practicable, as when the stock is large. After cutting the head of the stock, and making a slit as at 2, the graft to be inserted is to be shaped as at 3 and 4, and introduced so as the rinds of the stock and graft may come in contact, as at Fig. 1.

Fig. 5.—Rind Grafting; this is also performed where the stock is very large, and where more sorts than one are desired on the same head. The operation is on the same principle as the last, but instead of the slit being made in the head, a bodkin is inserted betwixt the wood and the rind, the graft, shaped as at 6 and 7, thrust into the head as soon as the bodkin is removed, and the rinds come in contact as in the last.

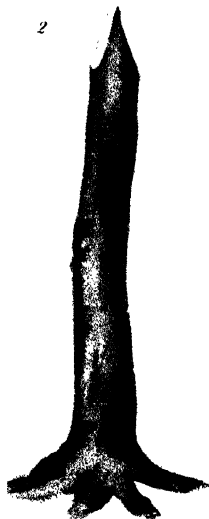
Fig 1



Fig 3



2



4



PLATE XI.

ON GRAFTING.

Fig. 1.—Saddle Grafting; this is but little used now; the art consists in making the notch in the graft, and the wedge on the top of the stock, so as to fit each other, and bring the rinds in contact, as at 2.

Fig. 3.—Shoulder Grafting is an operation seldom performed: it is done by cutting the graft and stock more than half through horizontally, leaving a tongue on the graft; then cut a piece out of the side of the stock, as at 4, corresponding with the tongue on the graft, and fasten them together.

Fig 1

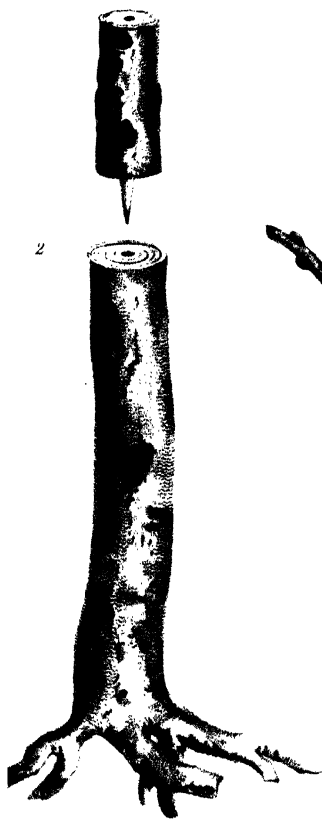


Fig. 3.



PLATE XII.

ON GRAFTING.

Fig. 1.—Terebration, or Peg Grafting. For this operation the stock and graft should be of the same thickness. The head is first to be cut off horizontally, and a hole bored in its center; the graft is to have an incision to within about an inch of its center, and the wood cut away so as to leave a peg, which is to be adapted to the size of the hole in the stock. This is a troublesome method and but seldom practised.

Fig. 3.—Side Grafting is simply Tongue Grafting, performed in the side of a tree, without its head being cut off, as at 4 and 5.

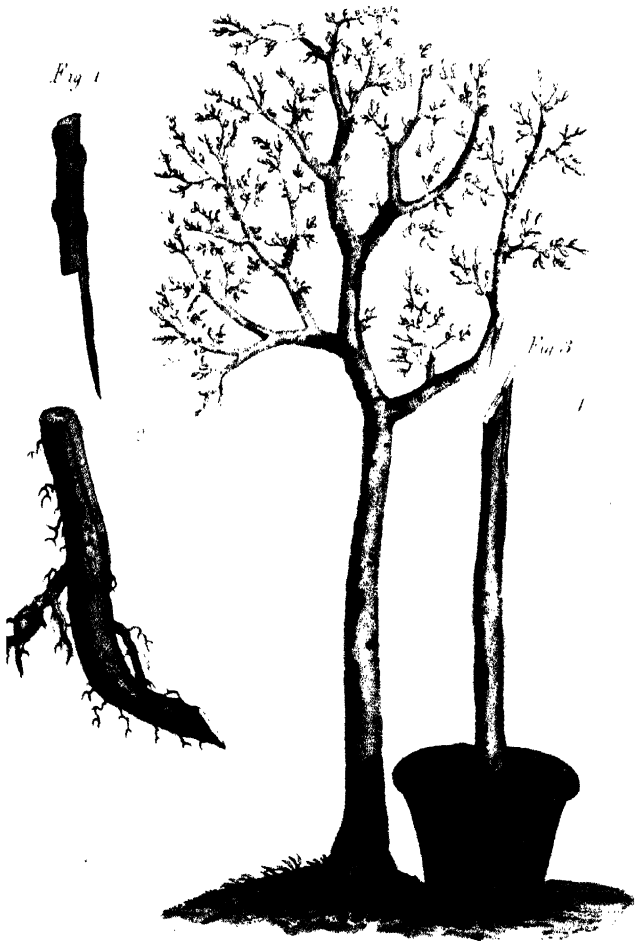
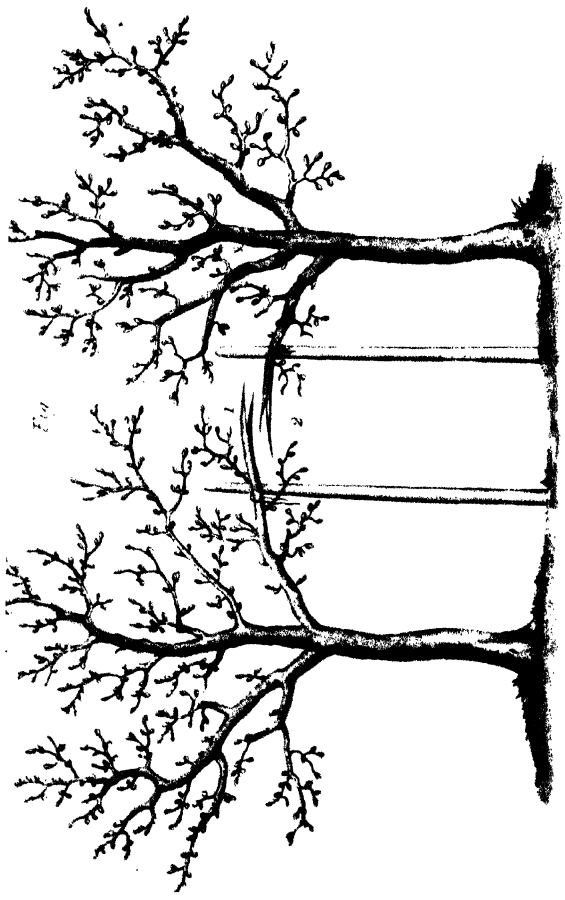


PLATE XIII.

ON GRAFTING.

Fig. 1.—Root Grafting; this mode is seldom practised; it is performed where a root comes in a suitable situation by any of the modes of grafting. That here represented is by Shoulder Grafting, 2.

Fig. 3.—Grafting by Approach. This is an operation frequently of considerable consequence, being chiefly used for grafting scarce shrubs and trees. The stock should be well established in its pot previous to the operation, and brought so close to the graft as to unite them by Tongue Grafting, without cutting the graft off as at 4.



Sed Edwards del. Pub. by Scurth. Florist Walworth Mar. 3 1824 F. Juniperus nana

PLATE XIV.

ON GRAFTING.

Fig. 1.—Inarching. This is performed on trees growing near each other, more as a curiosity than real use; it consists in joining the ends of two twigs by Tongue Grafting, as at 2. It is necessary to support them by placing a pole to each, to prevent their disunion by the wind.

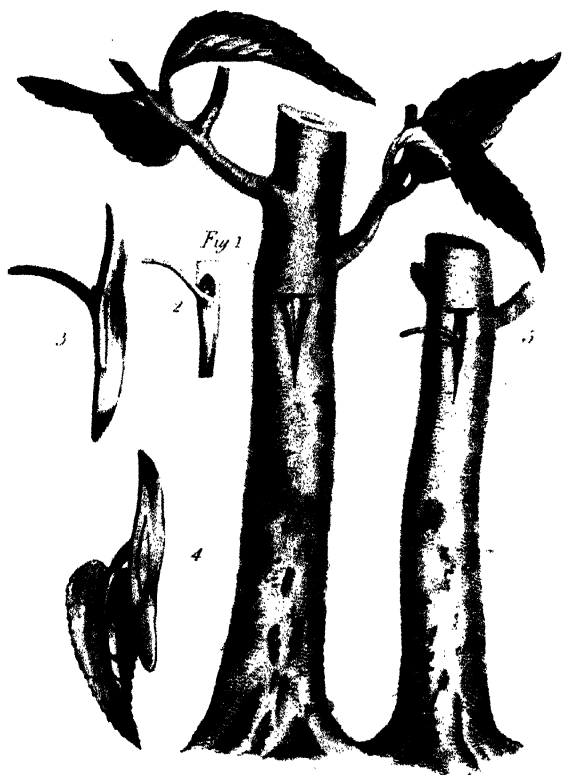


PLATE XV.

ON GRAFTING.

Fig. 1.—Budding or Inoculating. This operation is on the same principle as grafting, the bud being a shoot in embryo. The bud when taken from the shoot is to be cleared of its wood, as at 3 and 4, and cut to the shape of Fig. 2. The incision is then to be made in the side of the stock, as at Fig. 1, and the bud inserted as at Fig. 5, binding it round above and below the bud until the barks unite.

be placed in the upper part of the incision made in the stock to receive it, and pushed downwards; the upper part is then to be cut off transversely, and the bud pushed upwards so that the bark of the bud and the bark of the stock come in close contact. In this situation the bud is to be secured by a piece of bafs steeped in water, to make it pliable; no clay is used on this occasion. In about three weeks from the operation, the bafs is to be slackened, such buds as have taken will appear swelled, and the footstalk of the leaf will drop off on the slightest touch.

Budding is generally performed from the first week in July to the middle of August: grafting, from the second week in March to the middle of April. Thus, gentlemen, we have endeavoured to give you some general ideas of the nature of grafting and budding;—operations chiefly practised by gardeners, but not unworthy the attention of persons more liberally educated.

SECTION III.

On the Culture of Plants.

THE wisdom of God in the formation of the universe has been copiously treated of by a variety of learned and sensible authors, particularly Ray and Derham. The contemplative and curious enquirers will however find abundant matter to add to the observations of these ingenious naturalists. Among other parts of this infinite wisdom we may admire the manner in which the earth is covered with verdure. We find plants adapted to every soil and situation; scarcely a

speck but what gives life to some vegetable, and which again serves for the support of some animal or other: if we examine the wide extended ocean, the rapid river, the silent pool, the suffocating bog, the cloud capt mountain, the barren rock, the sandy desert, the fertile field, the dark and impenetrable wood, we find each productive of its respective plants, which will flourish in no other situations. In the hot scorching climates we find the earth chiefly covered with trees, shrubs, and ferns, whose roots penetrating deep into the ground, are thereby not affected by the dryness of the surface, which would destroy the grasses which particularly abound in more temperate climates, and afford the richest and most beautiful covering; if we go farther northward, we find the liverworts and mosses chiefly predominant, and which, like the animals of the country, are capable of sustaining the severest cold.

Thus then as different latitudes as well as

different soils and situations produce different plants, the first essential in the cultivation of them is an attention to these circumstances. Nature however is not so very nice in her choice as always to require a latitude, soil, or situation, exactly similar. Plants which grow in much warmer and much colder climates than ours, thrive well in our gardens; such as grow naturally in ponds, will succeed in a moist shady border; and such as are found in woods, will grow well in a northern aspect shaded from the sun; such as are found in chalk, will generally succeed in leam; and so on: but for the most part, the nearer we approach to or imitate Nature in this respect the better, for we shall find our success in gardening will be invariably in proportion to a proper use of the knowledge we have of the soil, situation, and climate, which naturally suits the plant we wish to cultivate.

This is the basis on which all rational gardening, and indeed a great part of agriculture,

must be built. Plants, growing in a warmer climate than our own, require, if planted in the open ground, to be covered or sheltered in the winter, but as it has been found inconvenient, and scarcely practicable, to secure such, in severe winters, in this way, green-houses and stoves have been invented, and are now in general use; these, however, are of no long standing in this country; the first figure of a green-house is, we believe, in Evelyn's Gardeners' Calendar, published in 1664.

But strange as it may appear, plants coming from a much *colder* climate than our own, are apt to suffer from the severity of our winters; this is easily accounted for, in the northern regions, where the weather in general is not so variable as with us; plants, during the whole of the winter, are covered with snow, frequently to a great depth; thus protected, they brave the most intense frosts.

In this island, especially the more southern

parts of it, from the extreme variableness of the weather in the winter season, plants have not the same salutary covering afforded them. If protected by a fall of snow from the keen north-easterly winds for a few days, the wind suddenly veers round to the south, warm weather succeeds, and the snow is dissolved; perhaps the next night the wind returns to its former quarter, and the unprotected plants are frequently destroyed.

It therefore frequently becomes as necessary to secure the plants from Siberia in a greenhouse, or common hot-bed frame, as those from Virginia or Carolina.

If, however, a greenhouse, or a hot-bed frame be wanting, or the plants cannot well be removed from the borders in which they grow, they should be covered with a hand-glass, which may be considered as a kind of greenhouse in miniature; but in very severe frosts these will require the additional covering of a mat, or some other substance.

It frequently happens that in the spring months very keen north-easterly winds prevail, which though they do not absolutely kill plants, disfigure them exceedingly, especially if they have been brought forward by the mildness of the winter; in such seasons we find a hand-glass, open at top, extremely useful; the particular advantage of such a glass is, that admitting the air it does not draw the plant up, and make it tender as a close glass does. These glasses are also useful in another respect; in the spring and summer we have frequent occasion to introduce plants into our garden; these when first planted require to be screened from the heat of the sun; this purpose is effectually answered by one of these glasses whitened over on the inside with whiting and water, which may at any time be washed off, at the same time that the solar rays are thus excluded, light and air are admitted in sufficient quantity to make the plant grow; the best substitute for

a glass of this sort is a garden pot without a bottom.

Notwithstanding all the advantages of foil, situation, and shelter, plants are liable to be obstructed in their growth by a variety of causes, sometimes by diseases arising from causes unknown to us, sometimes from excess of cold, heat, or moisture, but most commonly from insects and other animals.

Vegetables appear to be formed principally for the support of animals; hence we find almost every plant eaten either by its particular insect, or by several sorts; thus an oak affords sustenance to at least 50 different species, the willow to about 30, while the mullen supports one species only. Some insects are attached to one particular plant only, as the *Phalæna Typhæ* and *Arctii*; some will feed on two sorts, as the *Phalæna Verbasci*, which feeds indiscriminately on the mullen and water-betony; others again are not nice in their choice, but will feed on

almost any green vegetable, as the *Phalæna Lulnapeda* and *Phalæna Neuftria*.

There is no plant but what is liable to be eaten by insects; some feed particularly on the root, as the *Tipula oleracea*; some on the pith of the stalk, as the *Phal. arctii*; some on the wood of the trunk itself, as the *Phalæna coffus*; some, as the generality of caterpillars, on the substance of the leaves; others on the parenchymatous substance betwixt the two skins of the leaf, as in the fly, which feeds on the lovage; others on the flower, as the forficula, or earwig; others on the seeds or kernels, as the lychnis moth caterpillar, the weevil, and the hazel-nut grub; and plants which appear to be but of little service in other respects, and considered by some as useless, afford sustenance to a variety of insects; thus three different species of butterflies feed on the stinging nettle in their caterpillar state, viz. the *atalanta*, the *io*, and the *urticæ*; thus we find there is scarcely a plant, or part

of a plant, but what is liable to be destroyed by some insect or other, and hence it must be obvious, that a general knowledge of insects is intimately connected with the Cultivation of Plants.

It is very common in this country to call almost every disease to which a plant is subject by the name of a blight, and many very absurd opinions are entertained on this subject. Now blights may arise from various causes; they may arise from very cold north-easterly winds in the spring, when the trees and plants are in leaf, succeeding to a very mild season; the foliage in this case is disfigured, the parts of the fructification injured, and the fruit rendered abortive, and all this will be effected by cold merely.

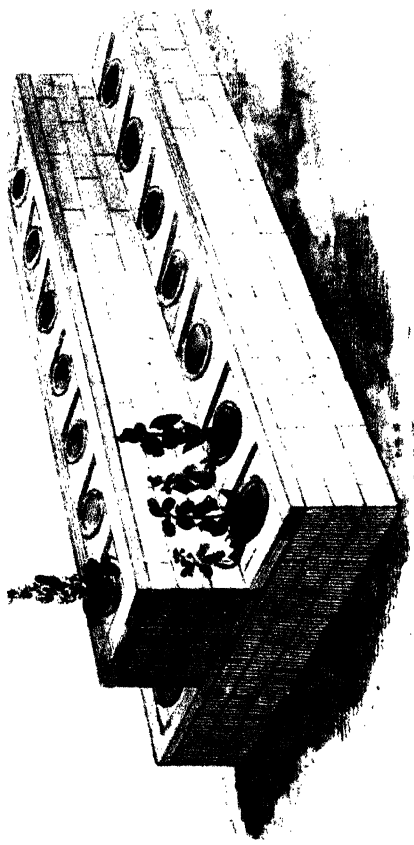
Blights may also arise from hot sun-shining weather, succeeding to long continued rains, when the foliage, being full of juices, cannot bear the sudden intense heat, but are scorched

by the solar rays; we have seen several instances of blight arising from this cause.

But by far the most common cause of blights arises from insects, especially the aphid, or plant-louse; a general and very erroneous opinion prevails, that these insects are brought by the east winds, but in fact the wind has nothing to do with this kind of blight.

The aphides are an extremely numerous family, and though they do not devour the foliage, and other parts of plants, as caterpillars, and many other insects do, yet by sucking the juices, they occasion the leaves to curl up, whereby the plant is disfigured, and, if not destroyed, frequently rendered abortive. Most of this family attach themselves to the stalk, leaves, and other parts of the plant above ground, but the root is also subject to the attacks of some of the species. We have frequently found them on the roots of lettuces, to which they prove uncommonly

destructive, but, as we before observed, they are much more commonly found either thickly surrounding the stalk, or on the under side of the leaf, as being the most vulnerable. These insects are said to be oviparous in the autumn, and viviparous in the spring; in their perfect state, they are winged; being viviparous, they are enabled to multiply exceedingly fast, and being winged, they are capable of flying from plant to plant, and extending their pernicious effects all over the green-house, the hot-house, or even the garden itself.



Exl. Edmuni. 401. Pich by S. Curtis. Ernest Hilworth. June 30, 1904. F. 1006m. 404

PLATE XVI.

ON THE CULTURE OF PLANTS.

Fig. 1.—Represents a very ornamental wall for exhibiting Alpine and other hardy plants in the garden; it consists of three rows of pots, plunged to their rims in gravel or sand, that in the center to stand highest. If expence were no object, five or more rows might be constructed on the same plan, making the ascent gradual; or if the back is placed against a fence, the same plan might be adopted, like so many shelves, the lower ones projecting a foot beyond the upper.

Fig 1



Fig 1



Fig 2



Fig 3



PLATE XVII.

ON THE CULTURE OF PLANTS.

Fig. 1.—Representing the nest of a very destructive Caterpillar, which feeds on most sorts of fruit trees. After they are hatched they proceed with great avidity to devour the foliage, as at Fig. 2. Acquiring the size of Fig. 3. it goes into the chrysalis state, and produces the Brown-tailed Moth, Fig. 4.



PLATE XVIII.

ON THE CULTURE OF PLANTS.

Representing a sprig of a Rose infested with the **Aphides**, or Plant-Lice; they attach themselves to the stalk, leaves, &c. and suck the juices so as to stop vegetation; few plants escape them in sheltered situations.



PLATE XIX.

ON THE CULTURE OF PLANTS.

Representing the Insect which perforates the Oak leaves, thereby raising what are termed Galls. When the egg deposited in the perforated leaf is hatched, and the insect become sufficiently strong, it eats its way through and escapes.



PLATE XX.

ON THE CULTURE OF PLANTS.

Representing Insects particularly destructive to Nuts and Apples, perforating them in a young state, and feeding on them till they arrive at maturity in the state of maggots; after going through the chrysalis state they become winged.

SECTION IV.

Lecture on Insects.

THE several productions of nature are arranged by naturalists under three principal heads, or divisions, to which they have given the names of kingdoms, viz. the Animal, the Vegetable, and the Mineral, and each of these has been divided into several grand sections or classes. The animal kingdom contains six classes, viz. Quadrupeds, Birds, Fishes, Amphibious Animals, Insects, and Worms; Insects then form a particular class of the animal kingdom.

The name of Insects, in Latin *Insecta*, has been given to this class of small animals from the form of their bodies, which is composed of several sections or parts, joined together by a kind of strangling or slender interstice, so that the animal, in some instances, appears almost cut in two, as in Ichnumon Libellula.

Of these insects some are composed of rings, which join one into another, and these are such as may in strict propriety be called insects, as their bodies are really composed of several portions; others, which may be called shell insects, have no similar rings, but are covered entirely with a kind of crust, frequently of considerable hardness, as in Crabs and Spiders; we may remark, however, that in the Spider the slender interstices connecting the thorax to the abdomen, is very apparent.

One character then of these animals is to have their bodies composed of distinct annuli, or rings, but this character is not the only

one, there is another no less essential to insects, and which is constant to most of them, which is, to have their head furnished with a kind of moveable horns, composed of several articulations, more or less numerous, which naturalists call antennæ. These antennæ vary extremely in size and form, their shape is of great service in determining the several genera. It is by the character of the antennæ that the class of Vermes or Worms is distinguished from that of insects, to which they have some affinity, and with which they have been injudiciously classed by some naturalists; any one totally unacquainted with natural history may easily acquire a knowledge of these antennæ from examining any one Butterfly; he will find the head of the insect is ornamented with two moveable threads, tolerably long, and thickest at the extremity, these are the antennæ of the Butterfly *Papillo Phalæna*.

• Besides these characters, some naturalists

add another, which is, having pores or holes, spiracula, situated along each side of the body, through which they breathe.

Insects then, whose essential characters we have now given you, are composed of three principal parts, viz. Caput, Thorax, Abdomen.

Caput, the head. This part in insects is without brain; the difference between the brain and spinal marrow consists in the former being a medullary part organized. We do not deny the existence of a medullary thread in the head of insects, but we never could discover it to be organized; hence the *Hippoboscæ Equina*, or Horse Fly, will live, run, nay even copulate, after being deprived of his head; to say nothing of many others which are capable of living a long while in the same situation. As they are not furnished with ears, we apprehend them incapable of hearing; as we can no more conceive that sense to exist without ears, than vision with-

out eyes. They are nevertheless susceptible of any shrill or loud noise, as well as fishes, but in a manner different from that of hearing. We are also dubious if they have the sense of smell, no organ being found in them adapted for that purpose; they nevertheless perceive agreeable and fœtid effluvia, but in a manner wholly unknown to us. Many insects have no tongue, nor make any sound with their mouth; but for this purpose some use their feet, others their wings, and others some elastic instrument, with which they are naturally furnished. Most insects have two eyes, but the Gyrinus has four, the Scorpion six, the Spider eight, and the Scolapendra three. They have no eye-brows, but the external tunic of their eyes is hard and transparent, like a watch-glass. Their eyes have no external motion, unless it be in the Crab; they consist, in the most part, of one lens only, but in those of the Butterflies dipteræ and many of the Beetles, they are more nu-

merous. Pugett discovered 17,325 lenses in the cornea of a Butterfly, and Lewenhock 800 in a fly.

It is on the head, as we before observed, that we find the antennæ, which are commonly two in number, in some four, as in the *Oniscus Aquatilis*, a species of aquatic insect, somewhat like the Millipedes or Hog Loufe. We shall not here pretend to determine the use of the antennæ, since the most eminent naturalists are not agreed about it; most probably they serve them as hands, to touch and examine bodies with: when these little animals walk, they stretch forward their antennæ, move them to and fro continually, seem to sound the ground on which they are to tread, and touch the surrounding bodies with them. As the antennæ are of great moment in distinguishing the various kinds of insects, we shall enumerate and explain the several different forms of them.

SETACÆ are those which grow gradually taper towards the extremity.

FILIFORMES, such as are of the same thickness throughout.

MONILIFORMES are filiform like the preceding, but consist of a series of round knobs like a necklace of beads.

CLAVATÆ, such as gradually increase in size toward the extremity.

CAPITATÆ are Clavatæ, but have the extremity somewhat round.

FISSILES are Capitataæ, but have the capitulum, or knob, divided longitudinally into three or four parts or lamina, as in the Scarabæi.

PERFOLIATA are also Capitataæ, but have the capitulum horizontally divided, as in the Dermestes.

PECTINATA, so called from their similitude to a comb, though they more properly resemble a feather, as in the Moths and Elateres; this is most obvious in the male.

ARISTATÆ, such as have a lateral hair, which is either naked or furnished with lesser hairs, as in the fly.

BREVIORES, those which are shorter than the body.

LONGIORES, those which are longer than the body.

MEDIOCRES, those which are of the same length with the body, all three of which varieties are distinguishable in the Cerambyces.

FEELERS, so first named by Linnæus, resemble filiform articulated moveable antennæ; they are most commonly four in number, sometimes six; they are sufficiently distinguished from antennæ, in being naked, short, and always placed at the mouth.

Os, the mouth, is generally placed in the anterior part of the head, extending somewhat downwards. In some insects it is placed under the breast, as in the Chermes, Coccus, Cancer (Crab), and Curculiæ.

ROSTRUM, or **PROBOSCIS**, is the mouth drawn out to a rigid point; in many of the hemiptera class it is bent downward towards

the breast and belly, as in the Cicada, Nepa, Motonecta, Cimex (Bug), Aphis, and remarkably so in some Curculiones.

MAXILLÆ, the Jaws, are two in number, sometimes four, and at other times none; they are placed horizontally; the inner edge of them, in some insects, is ferrated, or furnished with little teeth.

LINGUA, the Tongue, in some insects is taper and spiral, as in the Butterfly; in others it is fleshy, resembling a proboscis, as in the Fly.

LABIUM SUPERIUS, the upper Lipthis, is situated above the jaws, as in the Scarabæus and Gryllus.

STEMMATA, or Crown, are three smooth hemispheric dots, placed generally on the top of the head, as in most of the hymenoptera, and others; the name was first introduced by Linnæus.

TRUNCUS, the Trunk, is that part which comprehends the breast or the thorax; it is

situated between the head and abdomen, and has the legs inserted into it, that its parts may be distinctly determined; it is divided into Thorax, Scutellum, and Sternum.

THORAX. The Thorax is the back part of the breast; it is very various in its shape, and is called *Dentatus* when its sides are armed with points; *Spinosus* when its back is furnished with them, as in the *Cerambyx* and *Marginatus*, having its margin laterally dilated, as in the *Silpha* and *Cassida*.

SCUTELLUM, OR ESCUTCHEON, is the posterior part of the thorax; it is frequently triangular, and appears to be divided by an intervening suture, as in most of the *Coleoptera*.

STERNUM. The Sternum is situated in the interior part of the thorax; it is pointed behind in the *Elateres*, and bifid in some of the *Dytisci*.

ABDOMEN. The Abdomen is in most insects distinct from the thorax; it is the pos-

terior part of the body of the insect, and is composed of a number of annular segments, which serve occasionally to lengthen or shorten it, and to contain the organs of chylification.

SPIRACULA are little holes or pores, placed singly on each side of every segment of the abdomen; through these the insect breathes, and if oil be applied, so as to stop them up, it proves fatal to most of them.

TERGUM, the Back, is the superior part of the abdomen.

VENTER, the Belly, is the inferior part.

ANUS is the posterior part of the abdomen, perforated for the evacuation of the excrement; this part also frequently contains the organs of generation.

Having observed the general structure of Insects, it remains that we consider them systematically.

A judicious classification of them gives life and spirit to the science, and makes each

insect as it were declare its own name. For this part we are entirely indebted to Linnæus, who first reduced them into generæ, by giving them distinct characters.

The Classes of Insects are seven.

1. COLEOPTERA have crustaceous elybea, which join together, and form as it were a longitudinal future down the back of the insect.

2. HIMIPTERA have most commonly their upper wings crustaceous at the base, or of a middle substance, between elytra, which are of a coriaceous, and soft wings, which are of a membranous texture. The upper wings do not meet by any longitudinal future, and the mouth is either situated in the breast or inclining to it.

3. LEPIDOPTERA have four farinaceous wings, which are covered with very fine scales, laid over one another. In the mouth is contained a spiral tongue, or at least the rudiments of one.

4. **NEUROPTERA** have four membranous transparent wings (not farinaceous); they are with difficulty distinguished from the Hymenoptera by description, but having been once seen they are easily known. The tail, therefore, in these insects being without sting, we make use of it the more easily to distinguish this order.

5. **HYMENOPTERA**. These, besides having four membranous wings, have their tail armed with a sting, which however is not always made use of to instil poison, but frequently to pierce the bark and leaves of trees, and the bodies of other animals, in which it deposits its eggs, as in the Cynips, Tenthreds, Ichneumon, &c.

6. **DIPTERA**. This order is easily distinguished from the others, the insects of it having two wings instead of four; but principally by their halteres, or poisers, a distinction which excludes the male Coccus from this order.

7. **APTERA** is distinguished by having no wings at all.

These Classes are again subdivided into different Orders.

The **COLEOPTRA** are distinguished according to the shape of their antennæ, which are either filiformes, clavatæ, or setaceæ.

The **HEMIPTERA** are divided into two orders; 1st. those whose mouth is furnished with jaws, or, 2d. formed of a beak, which is either reflected under the mouth or placed in the breast.

The **LEPIDOPTERA** according to the shape of their antennæ.

The **NEUROPTERA**, according to the mouth having no teeth, having many jaws, having two teeth, or being formed into a beak.

HYMENOPTERA, according to the sting, being either venomous or harmless.

DIPTERA into those which have beaks and those which have none.

APTERA according to the number of their feet.

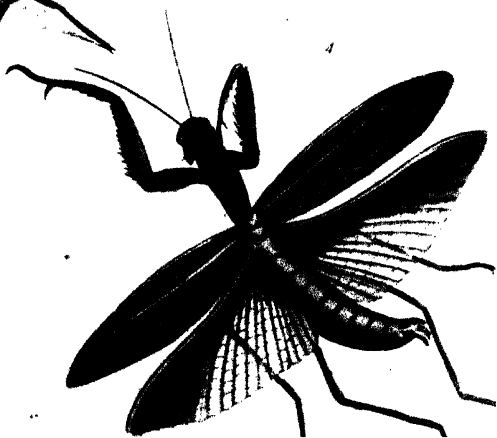


PLATE XXI.

ON INSECTS.

Order 1. COLEOPTERA.—Fig. 1. Genus *Cerambyx*.—
Fig. 2. Genus *Lucanus*, the Stag Beetle.

Order 2. HEMIPTERA.—Fig. 3. Genus *Fulgora*, Lan-
thorn Fly.—Fig. 4. Genus *Mantis*.

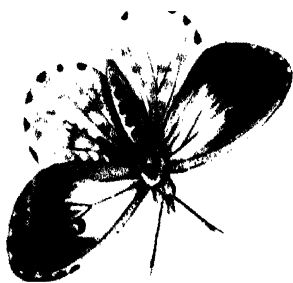


PLATE XXII.

ON INSECTS.

Order 3. LEPIDOPTERA.—Fig. 1. Genus *Phalena*, the Moth.—Fig. 2. Genus *Sphinx*, Hawke Moth.—Fig. 3 and 4. Genus *Papilio*.

1



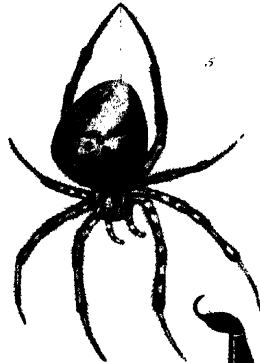
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6



PLATE XXIII.

ON INSECTS.

Order 6. DIPTERA.—Fig. 1. Genus *Tabanus*, Whame Fly.—Fig. 2. Genus *Musca*, Fly.—Fig. 3. Genus *Tipula*, Crane Fly.

Order 7. APTERA.—Fig. 4. Genus *Scolopendra*.—Fig. 5. Genus *Aranea*, Spider. — Fig. 6. Genus *Scorpio*, the Scorpion.

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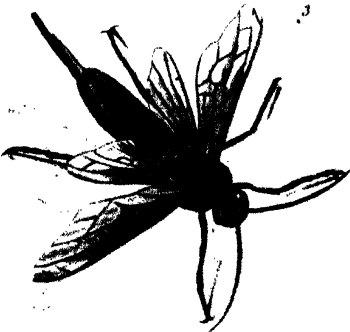
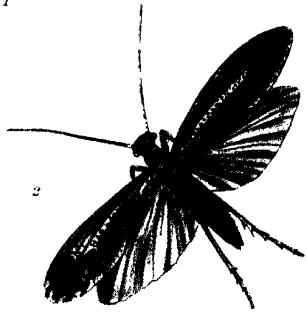
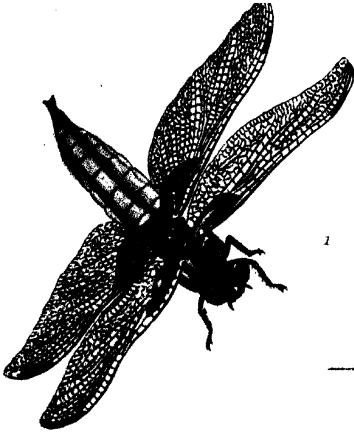


PLATE XXIV.

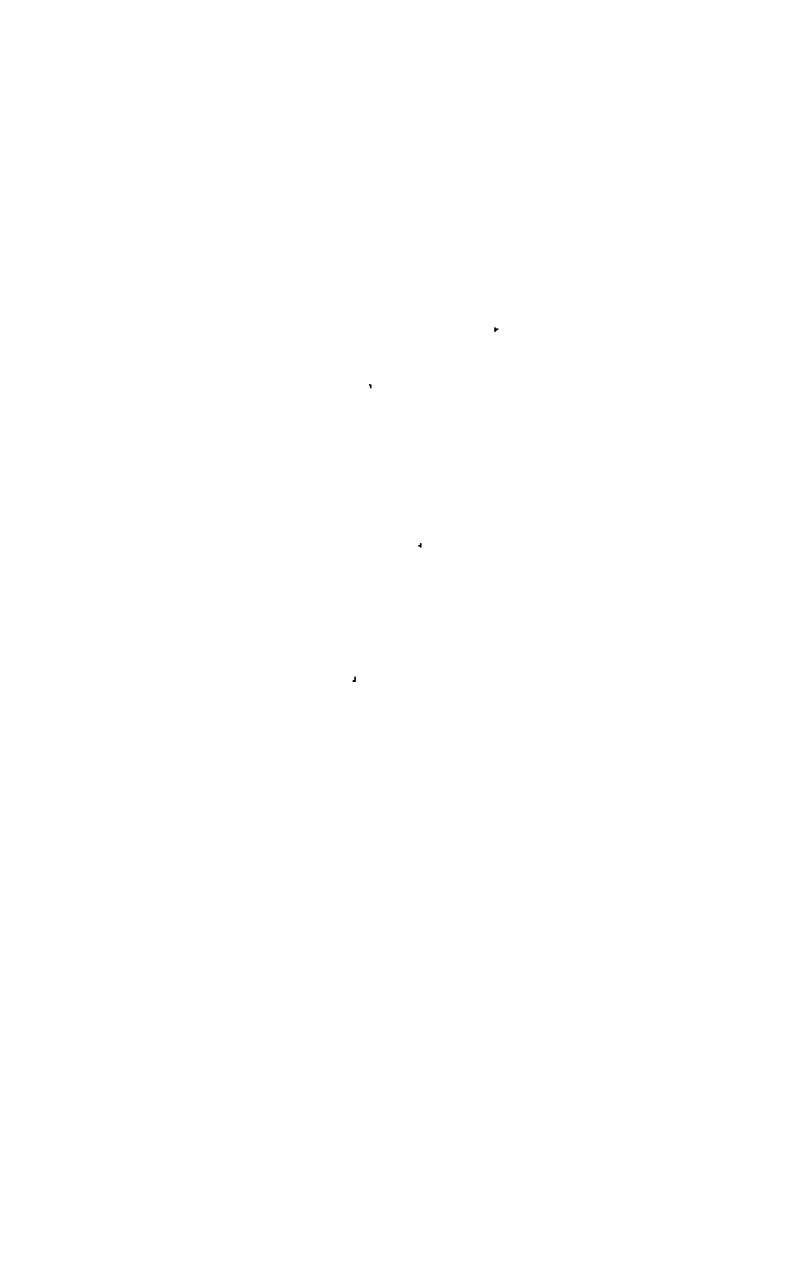
ON INSECTS.

Order 4. NUROPTERA.—Fig. 1. Genus Libellulæ, the Dragon Fly.—Fig. 2. Genus Ephemera, the May Fly.

Order 5. HYMENOPTERA.—Fig. 3. Genus Sirex.—
Fig. 4. Genus Vespa, the Wasp.

As there have been so many excellent treatises on the subject of Insects since the present Lecture was written, particularly that by the ingenious Mr. Donovan, to enter into the minute parts of the Lecture, which is very long, probably would trespass on the reader's time to but little advantage. We consider the Lecture, at the time it was written, as valuable as any of the others; but when we consider that the information it contains was made public twenty years ago, and all its merits since published in other works, it may be a sufficient apology for discontinuing it. It may be said the Lectures on Botany contain no more than what other works contain, but we consider the collection of the Lectures on Botany more divested of technical terms, as far as relates to a repetition of them, and on a more familiar plan than any other publication extant.

FINIS.



SKETCH
OF THE
LIFE AND WRITINGS
OF
THE LATE MR. WILLIAM CURTIS.

~~~~~  
BY DR. THORNTON\*.

Though hard the task with ripen'd worth to part,  
Though buried beauty rive the bleeding heart!  
Yet let not *rebel* man reproach his God,  
But prostrate bend, and kiss the chast'ning rod!  
The stroke that bids *our* hearts with grief o'erflow,  
Bids *their* freed souls with *joys immortal* glow;  
Bids *them* to being's *boundless source* return,  
With *saints* to mingle, and with *scraps* burn!

MAURICE.

VERY seldom does it occur that the memoirs of literary characters afford any entertainment. However authors may have to struggle with a world too generally neglectful of their merits whilst alive; however keen their sensations in the contest after reputation; such records would only after death excite a smile in the reader. It is, however, useful to science to trace the progressive steps of literary characters, amidst every embarrassment, and to point out the new paths they have opened, the several improvements they have made, or suggested: and at this time a recital of the great attempts and achievements of the late Mr. Curtis cannot be suspected as proceeding from any other than the purest motives. Linnaeus has accurately observed, and made it the ending of the preface to his

\* This gentleman is Lecturer on Botany at Guy's Hospital; Author of The Philosophy of Botany; The Temple of Flora; The Genera of British Plants; The Genera of Foreign Plants; The Grammar of Botany; The Philosophy of Medicines; and of The Philosophy of Politics.

Philosophia Botanica, the philosophic principles of botany,

Pascitur in vivis livor, post fata quiescit,  
Tum suis ex merito quemque tuetur honos :

“That malice and envy injure the living ; but, after death, each enjoys the honour which is due to him.”

WILLIAM CURTIS was the eldest son of a respectable tanner, of Alton, in Hampshire, who had, besides, three other sons, and two daughters. Notwithstanding this large family, he contrived to give them all good educations ; and William was put to a grammar school at Burford, in Oxfordshire, where he first evinced a genius toward the study of botany and natural history, which presaged future greatness. All his pocket-money he devoted to the purchase of books of that kind ; and, in the time of vacation, he made friends with a man of the name of Legg, of inferior circumstances, but who had a great knowledge of indigenous plants, and insects, and would often tease him to go out with, and parse to him, the many fine passages in that best book laid open by the bountiful hand of Providence, to every true cultivator of the science.

Particular geniuses are doubted by some. Several philosophers have taught that the brain is a *rasa tabula*, liable to impressions, and just as particular papers give out the stamp better than others, so all is in the ground, and the same genius, had it taken a different turn, would have evinced the same excellence.

Curtis, as though he had contemplated this dispute among the learned, makes it as the vignette to his grandest work, the *Flora Londinensis*, in vindication of the ways of Providence, pointing out the different pursuits of man, each led on by a peculiar bias\*.

Linnaeus discovered the same presages of future greatness as young Curtis did, although we cannot trace indications of this so far back in the latter, as is recorded by Strever, the biographer of the former, who reports, “that when in the cradle, flowers were brought to the infant, who held forth his little hands, and took delight in them,

\* Vide also page 6th of this Life.

and seemed impatient when they were removed." But this story of Linnæus goes to prove that his parents had a good garden, and thus early called forth the particular genius of that most distinguished naturalist.

It is remarked of Mudge, who formed the time-keeper named after him, that when just recovered from the small pox, at the age of seven, he pulled to pieces, and put together, the whole complex machinery of his father's watch, by way of amusement.

As Linnæus is reported to have filled that part of the garden allotted to him by his father, with wild flowers and insects, which soon over-run the whole, and devastated their foreign neighbours, so did young Curtis form, in one corner of the garden allotted him, a wilderness of what to the vulgar eye appear weeds, and he then noticed the insects which feed on and inhabit the several plants\*.

His father, conceiving that botany was connected with medicine, and observing this peculiar turn in his eldest child, mentioned it to his grandfather, an apothecary established at Alton, in much practice and reputation, especially among his own sect, the Quakers, who gladly received the lad, but reprobated his love for weeds and insects, endeavoured to divert a propensity so strange, in his idea, and turn his mind to the acquisition of medical science, or, in other words, the profits of the profession, which often-times lies concealed under that appellation.

Finding that nothing could change the wrong bias in the youth, his grandfather was resolved to fix him in London, where he would be constrained (he thought) from the empty pursuit of useless acquisitions; and he placed him with George Vaux of *Pudding Lane*, where he remained but a short time, and afterwards with one Thomas Talwin, of the same persuasion, and about as liberal in his conceptions as the old grandfather, but a

\* The papilio urticæ, small tortoise shell; and Io, peacock butterfly—are never found upon any other plant than the stinging nettle; the papilio brassica, cabbage butterfly, on the cabbage; others are attached to two sorts, as the phalæna verbasci, or water betony moth, which appears to be equally fond of the mullein and water betony, whilst others will devour several herbs, shrubs, and trees; even the most poisonous—for the phalæna antiqua, vapourer moth, thrives best on the deadly night-shade, and poisonous laurel.

very *taking* man, and possessed of extensive business, who had long resided in Grace-church-street, near the Monument. Many a lecture he now received from his new master, and the much-requested, and much-esteemed, Thomas Talwin, believed that he had over-persuaded (not over-ruled) young Curtis; and when sometimes absent a whole day, he thought it was the folly of youth, and not the madness of the love of natural history, that made him truant to his more immediate interests, the profession of physic.

The reader may guess his surprise, when he discovered, by some loose papers, his coadjutor an author. Talwin, confounded by the circumstance, forced open the private scrutoire of the young writer, which was confided in his house, and found for an hedge-nettle engraving, *three guineas!!* He no longer preserved Christian Patience; and, pointing out the horrors which awaited him, from a dereliction of his immediate duties, he obtained from him, with a reluctant sigh, the concession he so much desired.—His attention to medical lectures was now much noticed by Dr. George Fordyce, and Mr. Else, which regained the good opinion of Talwin, who dying soon after, left him the business.

But although the sacred fire of native genius may be smothered, it cannot be annihilated; it will finally break forth with an encreased power, and, like a torrent restrained by a mound, it swells, till, bursting over opposing obstacles, human fetters are found in vain.

Yet for a few years, worldly considerations seemed to have its predominance—Nature and Flora were neglected; but these at last gained their sway; and as no man, according to an old proverb, can serve properly two masters, Curtis felt it necessary to give up a share of his business, for a very small consideration, to Mr. Wavell.

The mischief, and consequent alarm, occasioned by the brown-tail moth, in 1783, induced him to take up the pen, and give the public a complete history of that destructive insect\*.

\* Some idea may be formed of their numbers, from the following circumstance. In many of the parishes of London, subscriptions were opened, and the poor people employed to cut off and collect the webs, at one shilling per bushel, which were burned under the inspection of the church-

He now ranged the fields, in pursuit of insects and of plants, published his *Fundamenta Entomologiæ* (elements of entomology), and established the superstructure of his *Flora Londinensis*. Wavell had the same turn of mind as his partner; and often both of them were absent in pursuit of similar objects.

In one of their herbarizing excursions, they came to Clapham Common. Wavell said, (for in the study of nature the mind is attuned to the softest sensations) that in Clapham church-yard, one of his relations had been buried. They searched out the tomb, and found it. Enquiry was then made about other relatives: one of them, a female, who had lived with the former, was removed from Clapham to Richmond. Curtis urged the claim; and, by persuasion, Mr. Wavell, a gentleman of equal address and abilities, waited upon his distant relation, at whose house was Captain and Mrs. Smith and their daughter. The strangeness of the rencounter excited interest; the young people gazed at each other, and both felt sensations they would willingly hide upon a first interview. The old people pressed a return of the visit, and the conclusion soon was a match, and the ample fortune of the maiden relation fell to his lot, to the no small disappointment of Sir Joseph Mawby, and many other expectants.

The newly acquired fortune of Wavell, and the botanical pursuits of Curtis, determined them both to leave the city; Wavell for the honourable profession of a physician, which he pursued at Barnstable, where, by suavity of manners, and superior attainments, he very soon became eminent as a practitioner. He, however, did not give up the study of botany, and often sent to Mr. Curtis a rare plant discovered in that vicinity. They were succeeded by Mr. Cleaveland, who did not live long after; whence this old established firm went rapidly to decay, and is not at this time in existence.

Mr. Hudson, the well-known author of the *Flora Anglica*, was the friend and admirer of Mr. Curtis; and he

wardens, overseers, or beadle of the parish. At the first onset of this business, four-score bushels, it is stated, upon creditable authority, were collected in one day, in the parish of Clapham. They were supposed to be the forerunner of the plague; and even prayers were offered up in some churches, to deliver us from the apprehended calamity.

gave up in his favour the appointment of demonstrator of plants to the Company of Apothecaries. The salary attached to this office is small; but the appointment is always esteemed extremely honourable, and is sure to bring the holder into notice. Miller, author of the *Gardener's Dictionary*, formerly held this appointment. The stated duties of it are to point out all the medicinal plants to the apprentices of the Apothecaries' Company, which are cultivated in Chelsea Gardens, bequeathed to that company by the late illustrious Sir Hans Sloane, under the condition that they were to present fifty new specimens of plants annually, to the Royal Society, until they should amount to 2000 different plants, which they were to keep up in that garden; and the demonstrator is obliged also, several times a year, to herbarize in the environs of London, with his pupils; and the produce of these excursions are afterwards presented before the master, warden, and members of the Apothecaries' Company; when the names and virtues of the plants so collected are publicly demonstrated.

Curtis, fired with that emulation which inspires the noblest minds, resolving to excel all who had preceded him, instituted *lectures on the science of botany*\*, and established also a *public garden* at Lambeth Marsh, in the vicinity of London, for which excellent purpose he issued the following well drawn up proposals.

“It must be allowed, that all human knowledge ought to be subservient to the good of society: and in proportion as this is advanced by any science, so ought that science to be held in esteem.

Providence, in his unerring wisdom, having allotted to mankind different capacities, and implanted in them propensities to particular pursuits, so that what is matter of the greatest satisfaction to one, shall be perfectly insipid to another, it is no wonder that they should differ so widely in the apprehended utility of their respective employments; each, from a principle predominant in the human mind, being willing to think his own of the greatest importance; and so strongly is this idea impressed on

\* The substance of which forms the three volumes to which this Sketch is prefixed.

Gregory, the ornament of his profession, and I may add of human nature. In his advice to the young physician, he thus delivers his sentiments on this head. "The science of botany is subservient to the practice of physic as far as it facilitates the knowledge of plants, by reducing them into the most commodious and perfect system; and although it is not necessary to be particularly acquainted with the name and history of every plant, yet every one ought to be so well founded in the principles of botany, as to be able to find its place in the system, and to describe it scientifically: AND WE OUGHT TO BE PARTICULARLY ACQUAINTED WITH EVERY MATERIAL CIRCUMSTANCE RELATIVE TO THOSE PLANTS WHICH ARE USED IN MEDICINE."

It is, however, much to be regretted, that this pursuit is so little attended to by gentlemen of the faculty in this country; hence they are often obliged to depend on the skill of the ignorant and illiterate, for many of their efficacious officinal plants, frequently at the expence of their own characters, and of all that is valuable to their patients.

Although newly discovered chemical remedies and foreign drugs, may have justly superseded many of our English plants, yet a great number are still retained in our Pharmacopœias, and many possess very poisonous qualities; to be acquainted with these at least, is the duty of every one that takes on himself the important character of guardian of the health of mankind.

But it is not to physic alone that botany is subservient; perhaps it is applied with as much advantage to agriculture, which is still extremely defective. In this enlightened age, when arts and sciences are carried to a pitch unthought of in former times, we might expect a nation celebrated not less for its arts than its arms, would be the first to promote a science whose improvements are the only solid check to the baneful and enervating effects of luxury and dissipation; and accordingly we find many of our nobility, gentlemen of landed property, and public societies, fully aware of its importance, and endeavouring by premiums, and a variety of other means, to improve it; much, however, still remains to be done; nor is it probable that their endeavours will be crowned with suc-



ness, till botany is more cultivated, and plants, particularly the grasses, better understood.

How incapable most of our modern writers on agriculture are of communicating their discoveries for want of botanic information, and how much the progress of this most useful science is thereby retarded, must be obvious to all those who have perused their writings with any degree of attention.

I am inclined to suppose, that this inattention of the faculty and others to botany, proceeds in a great measure from a want of opportunity to acquire it, and that if the means were afforded, there would no longer be cause of complaint or censure.

To afford *the means* of obtaining this knowledge, is the object of the present institution—an institution which has been attended with considerable expence, and cost the author much time and attention. Should he have the pleasing satisfaction of seeing it become productive of *national* utility, that time he shall think usefully employed, and that attention most happily bestowed.

The more effectually to succeed in promoting the knowledge previously recommended, as so essential to the interests of individuals, and the community at large, he has selected from the boundless field of vegetable productions, certain classes of plants, universally acknowledged to be either the most useful, or the most necessary to be known; by which means the student's attention is more immediately directed to the objects of his pursuit; these are the *medicinal, culinary, poisonous, agricultural, and British* plants, all of which classes are kept in *separate and distinct quarters*, expressed in the plan of the garden; to these are added two other quarters, the one containing such plants as are calculated to instruct the student in the principles of the Linnæan system, being *living examples* of most of his classes and orders; the other furnished with hardy, ornamental flowers and shrubs, chiefly *exotic*, and cultivated in the gardens of the curious.

As the practical part of botany, as well as of every other science, is the most useful, so it is presumed, the mode of communicating this knowledge is such as will meet with general approbation: this is effected by hav-

ing the generic and trivial name of each plant, according to Linnæus, painted in a legible hand, and affixed to it; and that none may lose the advantage of acquiring a knowledge of plants from a non-acquaintance with Latin, the English names also are added, with a view that botany, in this familiar dress, might be instructive to those whom the bare mention of a long hard-sounding Latin name might tend to discourage.

And the author is ready to flatter himself that many persons who are naturally fond of plants and flowers, will be ready to encourage an undertaking of this kind, by which, at the same time that they indulge their particular taste, they may insensibly acquire knowledge.

It has been objected by a few, that a knowledge of plants thus easily acquired, is as easily forgotten; but this must certainly be more the fault of the students than the method, as they may, without molestation, spend as much time as they please in investigating them, and becoming perfectly acquainted with their characters; and, still farther, to assist them in their studies, a library of those books most necessary for students is open to their inspection.

It now remains for the author to express his gratitude to those who have patronized, encouraged, and assisted him in his undertaking.

To the generosity and public spirit of the Honourable Daines Barrington, and Thomas White, Esq. his principal patrons in this undertaking, the garden in a great degree owes its existence.

From his Majesty's matchless collection of plants in the Royal Garden at Kew, kept up with the most unremitting attention, by that intelligent botanist and gardener, Mr. Aiton, he has had the honour to receive many scarce and valuable plants, both British and foreign; as also from the gardens of the Earl of Bute, at Luton; the Duchess Dowager of Portland, at Bulstrode Park; the late Dr. Fothergill, at Upton; Dr. Pitcairn, at Islington; Dr. Lettsome, at Grovehill, Camberwell; and the Apothecaries' Company, at Chelsea.

He is indebted for plants to the Right Hon. the Earl of Plymouth; Sir Joseph Banks, Baronet; Rev. J. Lightfoot, Uxbridge; Rev. Dr. Goodenough, Ealing; Thomas Eastland, Esq. York; T. G. Cullum, Esq. Reverend Mr.

Laurents, Bury; James Crowe, Esq. Norwich; Thomas Woodward, Esq. Bungay; Mr. Dickson, Covent Garden; Mr. Sole, Bath; Mr. William Fothergill, Wensleydale, Yorkshire; Rev. T. Woodford, Winchester; Rev. J. Davies; Rev. R. Relhan, Cambridge; Dr. Calvert, LL. D.; Mr. Grimston, Northampton; Mr. Howard, Knutsford, Cheshire; Mr. Cockfield, Upton; Mr. Wagstaff, Norwich; Mr. Sparshall, Yarmouth; Mr. Alexander, Halifax; Mrs. Curtis, Alton; Mrs. King, Blackheath; Mr. Wheeler, Mr. Willis, Mr. Sibley, Mr. Ridout, Mr. Upham, Mr. Rayer, Messrs. Lee, Gordon, Malcolm, Drivers, Loddiges and Grimwood, nurserymen, London; and the Rev. Mr. Lyons, Dover. He is fearful he has omitted many other kind contributors; he hopes such will not be offended, and that there are yet many persons in different parts of Great Britain who will not need the stimulus of example to furnish the author with many of his desiderata."

A Catalogue of the plants in the Botanic Garden, (about 6000), was provided for each subscriber.

On the quarter containing **MEDICINAL PLANTS**, he remarks,

"By the wise and unchangeable laws of Nature, established by a Being infinitely good, and infinitely powerful, not only man, the lord of the creation, "fair form who wears sweet smiles, and looks erect on heaven," but every subordinate being, becomes subject to decay and death; pain and disease, the inheritance of mortality, usually accelerate his dissolution; to combat these, to alleviate when it has not the power to avert, Medicine, honoured art! comes to our assistance.

It will not be expected that we should here give a history of the ancient practice, or draw a parallel betwixt the success of former physicians and those of modern times; all that concerns us to remark is, that the ancients were infinitely more indebted to the vegetable kingdom for the materials of their art than the moderns: not so well acquainted with the economy of nature, which teaches us that plants were chiefly destined for the food of various animals, they sought in every herb some latent healing virtue, and frequently endeavoured to make up the want of efficacy in one by the combination of

numbers: hence the extreme length of their farraginous prescriptions.

More enlightened ideas of the operations of medicines, joined to several powerful remedies drawn from the mineral kingdom, have taught the moderns greater simplicity and conciseness in practice; perhaps there is a danger that this simplicity may be carried too far, and become finally detrimental to the exercise of the healing art.

In selecting the plants used in the practice of physic, commonly called *officinals*, we have confined ourselves to those enumerated in the dispensatories of this kingdom, dividing them into two classes, one of which may be distinguished by the name of *usitata*, and the other *minus usitata*; in the former we include all those of the present London and Edinburgh Pharmacopœias, in the latter such as are omitted by the colleges, but retained in Lewis's Dispensatory, with some few of more modern introduction.

Those plants which have numbers prefixed to them, are at present growing in the garden, those which have none have not yet been obtained, and such as have an asterisk are either the produce of warmer climates, or to be found only in the stoves and conservatories of the curious."

On the second quarter, containing CULINARY PLANTS, he remarks,

"The vegetable food of the inhabitants of different countries, varies with the productions of each; in the hot climates, nature, lavish of her stores, pours forth spontaneously a profusion of vegetables, suited to the influence of the sun; in the temperate and colder climates, what nature has abridged, the industry and ingenuity of man has abundantly supplied: thus, in our own country, to which nature with a sparing hand has administered the necessaries of life, we are enabled to indulge in the luxuries of the Indies.

The Pine Apple, the Grape, the Melon, and a variety of other delicious fruits, are here brought to a degree of perfection rarely seen even in the countries which give them birth.

Certain nations are in the practice of living on a

greater variety of vegetables than others; the French, whose cookery is so highly esteemed by some, use a number of herbs scarcely known to us; the Dutch also are celebrated for the productions of their kitchen gardens.

We, as a nation, are certainly more in the practice of eating vegetables than formerly; hence, perhaps, the sea-scurvy has in a great degree been banished from among us, and the community benefited in various ways.

This department, though the most cultivated of any, is still capable of improvement; many other vegetables may be introduced with advantage; among these the English Mercury, or Good King Henry, the Sea Beet, and Common Chickweed, deserve to have more attention paid them, being excellent substitutes for Spinage, and more hardy. The first of these, though unknown to the greatest herb market in the kingdom, Covent Garden, is cultivated in many parts of England, especially Lincolnshire and Yorkshire: the second grows wild by the sea side, and is easily propagated in the garden: the latter is always accessible to those who have no garden, particularly in the spring, when potherbs are scarce."

On the third, containing COMMON POISONOUS PLANTS, he remarks,

"However plausibly the medical practitioner may excuse his ignorance of plants in general, the public has a right to expect, that he should lose no opportunity of making himself acquainted with those of the present class, since they are few in number (thirteen), and capable of producing in a short time the most deleterious effects."

On the fourth, containing AGRICULTURAL PLANTS, OR such as are useful and noxious to the husbandman:

"It is presumed," says Mr. Curtis, "the present Catalogue is the first of the kind ever offered to the public; it will be no wonder, therefore, if it should fall short of perfection: most of the plants contained in it are of British growth; of the *useful* ones, many have long been known and cultivated in this country; several new ones are inserted, as deserving to be more generally known to the husbandman; of these the Grasses, a much neglected tribe, form

no inconsiderable part: at present, out of a hundred and three species, the produce of this country, considered by surrounding nations as most fertile in its herbage, only one is cultivated for pasturage, and that confessedly deficient in many of the requisites of a good grass. Mr. Stillingfleet, in his *Miscellaneous Essays*, has taken much pains to recommend several others as superior, and about as many more are here added, from my own observations.

If the agriculturist has been inattentive to the plants of the useful kind, the noxious plants have engaged still less of his attention, though highly deserving of it.

Future observations will doubtless make it necessary to add many other plants to those here enumerated, perhaps retrench some of the present list, and throw a much greater light on the whole."

On the fifth, **BRITISH PLANTS**, is given the following admirable preface.

"To the distinguished abilities, unwearied assiduity, and communicative disposition of Mr. Ray, assisted by many of his cotemporaries, we are indebted for the first *British Flora*, which could in any wise be considered as complete; such was his "*Synopsis Stirpium Britannicarum*," the third edition of which still remains to be most deservedly valued; in this work we have an enumeration, and frequently a description, not only of the more perfect plants, but also of the *Musci, Fuci, Fungi, &c.* all arranged according to a system of his own. To this system of our great predecessor succeeded that of the celebrated Linnæus, the ornament of Sweden; the excellence of which was such as to create general admiration, and insure it an almost universal reception: hence it became necessary, (if I may be allowed the expression), to Linnæanize Mr. Ray. This arduous task was attempted by Mr. Hudson; and Mr. Ray's *Synopsis*, to speak metaphorically, transmigrated into Mr. Hudson's *Flora Anglica!* in which form, though it retained the advantages of a new body, it lost a portion of its original spirit, much useful information being suppressed, and many distinct species made into varieties; it was, however, enriched with many new plants, discovered by Mr. Hudson and his friends.

In the year 1777, Mr. Lightfoot having accompanied Mr. Pennant into Scotland, for the purpose of making discoveries in natural history, favoured the public on his return with an ample account of the plants discovered in his northern tour, under the title of "Flora Scotica;" the value of which was greatly enhanced by the new lights thrown on the cryptogamous plants in general, and the excellent plates of several rare plants which accompanied it.

In the succeeding year appeared the second edition of Mr. Hudson's book, in which the plants of the Flora Scotica, with many additional ones previously discovered, were inserted.

The works of these three different authors, the only practical ones of any note that have been published in this country, form the basis of the present Catalogue. Where *I have not* had an opportunity of observing or cultivating the plants which they enumerate, I have relied implicitly on their accuracy; where *I have*, as an enquirer after truth, I presume I should have been censurable not to have used the lights, which perhaps a more minute enquiry, or better opportunities of cultivation, had afforded me; hence I have in several instances differed, both from Mr. Ray and Mr. Hudson, and am sorry to have occasion to differ so materially from the latter, in the account he has given of the grasses, in the second edition of his work. The reasons at large for such differences will be given in the Flora Londinensis, (vid. *Ranunculus hirsutus*, *Polygonum minus*, *Sedum sexangulare*, &c.): the only notice taken of them here, will be to print in Italics those plants which I apprehend to be species, and which Mr. Hudson considers as varieties. As the garden contains more than two-thirds of the *more perfect* British plants, it was apprehended that the addition of the remainder, which either cannot be made to grow, or have not yet been obtained, would render this publication more useful, not only to those who may have opportunities of visiting it, but to those also who have only the garden which nature affords them; they are incorporated with the rest, and distinguished by having no figures prefixed to them; such as have an asterisk, are considered as doubtful natives.

As we have no complete Calendar of a British Flora, it was thought that the utility of this little volume would be still farther enhanced, by arranging the plants according to the months in which they usually flower in the garden: by this means, not only subscribers know what plants they have a right to expect in blossom at particular seasons, but the botanist at a distance may judge what plants he is likely to find in his herbarizing excursions: allowances will naturally be made for variations of flowering, dependent on extraordinary seasons.

There is a circumstance relative to the blowing of certain plants, which deserves some attention here; I mean such as the Groundsel, Shepherd's Purse, Daisy, Dwarf Meadow Grass, &c. I would observe, that though these may, if the winter prove mild, be found in blossom throughout the year, yet there is a certain month in which they flower more plentifully, and with more certainty, than in any other; thus, the Shepherd's Purse has the greatest profusion of bloom in April, the Daisy in May, the Poa Annua in June, and so on. Such we apprehend to be the proper period of such plants flowering, and have set them down accordingly."

Here he sat enthroned, with a numerous class of pupils, eagerly catching up every word that came from his mouth; the public encouragement of the Hon Daines Barrington, Sir Joseph Banks (now the Right Hon.), Dr. Fothergill, Dr. Lettsome, and many other great and conspicuous characters, for his patrons; and, as it were in the very heart of London, a new Eden disclosed all her beauties to the scientific as well as to the admiring eye.

Placed, like Linnæus in the garden of Cliffort, he conceived the sublime notion of giving *A complete Natural History of the British Isles, with Plates of each Object*, not upon a neat, diminutive, inadequate scale, but one that was equally just, magnificent, and noble, like our Empire—one truly worthy of the British Nation.

But the attempt was as new as it was grand; and, fearful of the disgrace of not succeeding in so extensive and hazardous an enterprize, he sounded first the public mind, by publishing proposals for *a part* of this great national work, which he should have entitled, *Flora Anglica*, or *Flora*



Britannica, but which he called "Flora Londinensis." His address to the public respecting this work was as follows:

"If we consider the numerous pleasant villas, and delightful rural retreats of the nobility, gentry, and opulent tradesmen, within the circle of ten miles from this metropolis, the abodes of ease and contemplation, there needs no apology for introducing a work of this kind, which is confined to the wild plants the liberal hand of Nature has spontaneously scattered in their neighbourhood.

It is universally agreed, that there is no science which yields more pleasing amusement, gives more rational entertainment, or conduces more to the happiness and advantage of mankind, than a knowledge of the *vegetable creation*. Thus, we find King SOLOMON, who was peculiarly distinguished for the excellency of his understanding, the magnificence of his palaces, the splendour of his court, the beauty and variety of his gardens, was perfectly skilled in this science, and spake of 'plants from the cedar of Lebanon to the hyssop which springeth out of the wall.' To enumerate all the advantages which might accrue to the public from a work of this kind, would far exceed the limits of these proposals.

The London student in botany, for whom it is more particularly designed, from carefully observing the plants and flowers as dissected and delineated, and comparing them with the descriptions, will not only acquire an idea of the Linnæan System, but likewise become acquainted with the greatest part of the plants growing wild in Great Britain; and as, next to the objects themselves, nothing strikes us so forcibly, nor satisfies us with such certainty, as their true and accurate representations; so the ideas of the plants acquired by this means, will be so impressed on the mind as not easily to be erased.

The botanist at a distance from London, will no doubt be pleased to have an opportunity of seeing what plants grow wild in the environs of a city, emphatically termed by a foreign botanist of the greatest eminence, '*punctum vite in vitello orbis.*'

The medical student, who ought at least to make botany so far his study, as to know what plants are poisonous, and what are made use of in medicine, will, from the

proposed work (so far as relates to our indigenous plants), acquire a considerable degree of this necessary knowledge, as in the description the qualities of such will be particularly mentioned.

The farmer and grazier, who are considerably interested in a knowledge of our English grasses, and of those plants which are noxious to cattle, will, it is presumed, be ready to encourage a work in which such plants will be obviously represented, and their qualities particularly specified. It being the author's professed design, as much as possible, to give an account of the economical uses of plants; and many of those being local, any authentic information respecting them will be thankfully received, and gratefully acknowledged.

The philosopher, whose abstruse studies and sedentary life too often prove injurious to his health, will find the study of plants yield him many hours of agreeable relaxation, and contribute to give him that which sweetens every other blessing of life.

Those gentlemen and ladies, who, from motives of profit or amusement, occasionally employ themselves in painting flowers, will here find abundant variety to exercise their ingenuity and pencils.

To conclude, the author's principal aim in this work, is to render the acquirement of botanic knowledge easy and pleasant: for this purpose, he has taken much pains, and been at considerable expence, in having all the plants drawn from nature, and engraved by an ingenious artist, under his own inspection. Desirous of making it as useful as possible, he has endeavoured to unite cheapness with accuracy and elegance. How far he has succeeded, he willingly submits to the judgment of a generous and discerning public, whose encouragement he wishes not to experience but by meriting their approbation."

The Conditions were:

"For the convenience of the purchasers, it is proposed to publish this work in numbers; each number to contain six plates in folio, accurately drawn and neatly engraved, with six pages of letter-press. Price 2s. 6d. plain, 3s. coloured.

The plants will be drawn of their natural size; but where a whole plant cannot be represented, a branch or part of it only will be figured, as it is imagined, a better idea of the plant may be acquired by this method, than by representing some of their natural size, and others reduced.

To be continued until the whole of the plants growing wild within ten miles of London are figured and described: and if the author should be favoured with health, and meet with the necessary *encouragement*, it is proposed afterwards to publish a continuation of it, to extend to all the plants which are indigenous to Great Britain.

To prevent confusion, as well as facilitate the arrangement of the plants according to any particular system, only one plant will be engraved on a plate, except some of the mosses and lichens, two of which will sometimes be given on the same plate."

Two opinions might have made him adopt the title of *Flora Londinensis*. Conscious of the jealousy of authors, he may have feared that Hudson would have blamed him as trespassing on the rights of his former friend and benefactor, whose work would be eclipsed by this better performance; or distrusting the support he was likely to receive for a grander attempt, if unsuccessful, he might conclude with a rival work to the "*Flora Parisiensis*" of the famous Vaillant, but one in fact, though admirable, infinitely superior to his.

Curtis conjectured right; for neither the novelty of the plan, accuracy and fidelity of the drawings, beauty of colouring, excellency of description, or confessed utility of the work (which being paid for in parts, the expensiveness thereof could not be felt by the purchaser), procured him the encouragement he deserved.

Frugal and economical in the extreme, assisted by money devised to him by his father's death, the profits of his lectures, and the subscriptions to his garden—all went towards the accomplishment of this new and national undertaking.

At last all failing, the *Flora Londinensis* was obliged to move on so slowly, as to merit to be called a stop. Dr. Lettome, the well-known philanthropist, whose many

great acts of private and public beneficence place him nearly at the top of the scale of British worthies, enquiring into the cause of this tardiness, unsolicited, remitted to Mr. Curtis, not the loan of a few guineas, with pompous acclamation, but the large sum of Five Hundred Pounds! without any proper security; for Mr. Curtis was then, from his *Flora*, involved in debt.

With this new acquisition, Mr. Curtis brought out several numbers, with some degree of spirit; but not finding any reasonable prospect of more public encouragement, he turned his mind to profit, and attempted, on the same plan as his *Magazine*, but with plates diminished one-fifth, an octavo edition of the *Flora Londinensis*, in numbers, very few of which were published, though he had prepared several; for he seemed ashamed of the disparity which was obvious in the two works; but it gave birth to the *English Botany* of Dr. Smith, and Mr. Sowerby\*: but this production of these gentlemen leaves the first work of Mr. Curtis to shine with undiminished splendour. He next attempted *Decades of Figures*, in octavo, to illustrate the *Materia Medica*. This in the same way, after two numbers, he relinquished; and it gave birth to the *Medical Botany* by Dr. Woodville†.

At this time his mind was fully bent upon forming a *Botanical Magazine*. It was to come out in numbers, at but one shilling, and to contain three plates, and three

\* Dr. Smith, the founder of the Linnæan Society, is generally the first botanist in the world, and his knowledge of British plants is most extensive; and it is still to be hoped, that as other countries can boast of a *Flora Rossica*, *Flora Danica*, *Flora Austriaca*, and a *Flora Peruviana*, Roxburgh's *Plants of Coromandel*, &c. &c. (works in folio), that the author of the *Flora Græca*, who has all the means, and capability, will accomplish, for his own glory, and that of the country, the plan which can be said to be only *ébauché*, by the late Mr. Curtis, on a *scale* which alone is suited to the dignity of the subject, and the nation. The highest praise is, however, due to the *English Botany*, a work accommodated to the finances of each student. See Note, p. 32, which explains our meaning of the word *National*.

† The *Medical Botany* of Dr. Woodville, however, was conducted upon a quarto size: and the medical virtues of plants are detailed at large. It was brought out, like the other, in numbers, and the Doctor fortunately lived to complete it.

descriptions. Twelve numbers make an octavo volume. In the preface to the first volume, he states :

“ The present periodical publication owes its commencement to the repeated solicitations of several *ladies* and gentlemen, subscribers to the author’s Botanic Garden, who were frequently lamenting the want of a work which might enable them, not only to acquire a systematic knowledge of the foreign plants growing in their gardens, but which might at the same time afford them the best information respecting their culture—in fact, a work in which Botany and Gardening (so far as relates to the culture of ornamental plants), or the knowledge of Linnæus and Miller, might happily be combined.

In compliance with their wishes, he has endeavoured to present them with the united information of both authors, and to illustrate each by a set of new figures, drawn always from the living plant, and coloured as near to nature as the imperfection of colouring will admit.

He does not mean, however, to confine himself solely to the plants contained in the highly-esteemed works of those luminaries of Botany and Gardening, but shall occasionally introduce new ones, as they may flower in his own garden, or those of the curious in any part of Great Britain.

At the commencement of this publication, he had no design of entering on the province of the florist, by giving figures of *double* or *improved flowers*, which sometimes owe their origin to culture, more frequently to the sportings of nature; but the earnest entreaties of many of his subscribers, have induced him so far to deviate from his original intention, as to promise them one, at least, of the flowers most esteemed by florists.—*Botanic Garden, Lambeth Marsh, 1787.*”

Soon followed—

“ The encouragement given to this work, great beyond the author’s warmest expectations, demands his most grateful acknowledgments, and will excite him to persevere in his humble endeavours to render Botany a lasting source of rational amusement and public utility.”

Every botanist must feel the degradation Mr. Curtis submitted to, at the earnest entreaties of many subscribers, to give double flowers, for the ornament of his new work, knowing that these are esteemed monsters by botanists. There is also no regular description, of which he was so capable, or trace of dissection.

How different from the conduct of his *Flora Londinensis*, where each part of the plant is so accurately given, and where the descriptions established his fame with all the enlightened botanists of Europe. It has since been recommended, with more propriety, as was his *Flora*, as a *drawing book* for ladies; and, with respect to the execution of the figures, we cannot, to use the words of the Linnæan Smith, too strongly express our approbation—"Although afforded at so cheap a rate, they would do credit to the most splendid works; indeed we know of no coloured plates, not even those of Jacquin, that excel them in beauty or truth: they are as much superior in elegance to the tawdry, ostentatious works of Trew, as they rise superior to those of Miller or Catesby in accuracy."

This work commenced on the first day of February, 1787, and was continued by him until his death, in July 1799, when he left behind him materials prepared for nearly two hundred figures: since which time it has been carried on by the indefatigable and learned Dr. John Sims.

In June, 1805, two hundred and twenty numbers had appeared, containing eight hundred and forty-eight figures and descriptions. As the progress of this work is much more rapid of late years, than in Mr. Curtis's time, the contents of each number being increased from three to eight figures, at three shillings each, it promises soon to become very important, in consequence of the number of original delineations, all made from living plants, with rare botanical accuracy, by that excellent artist, Sydenham Edwards.

Mr. Curtis also published "A Key to the Linnæan System," on a quarto plate—"A full Explanation of the Sexual System, the Classes and Orders, illustrated by

several Plates"—Also an admirable Dissertation on Grasses\*; and a small tract on the *Crambe Maritima*, or Sea Kale.

He not long after quitted Lambeth Marsh, to settle at *Queen's Elms, Brompton*. The reasons for this procedure he assigns as follows:

"I had long observed, with the most pointed regret, that I had an enemy to contend with in Lambeth Marsh, which neither time, nor ingenuity, nor industry, could vanquish; and that was the smoke of London; which, except when the wind blew from the south, constantly enveloped my plants, and shedding its baneful influence over them, destroyed many; and, in a greater or a less degree, proved injurious to most of them, especially the Alpine ones. In addition to this grand obstacle, I had to contend with many smaller ones, which became formidable when combined; such as the obscurity of the situation, the badness of the roads leading to it, with the effluvia of surrounding ditches, at times highly offensive.

Nevertheless, when I reflected on the sums I had expended, when I surveyed the trees, the shrubs, and the hedges which I had planted, now become ornamental in themselves, and affording shelter to my plants, such of those inconveniences as I could not have remedied I should have borne with patience, and continued my garden under all its inconveniencies, had not my landlord exacted terms for the renewal of my lease too extravagant to be complied with.

Disappointed, but not disheartened, I resolved to attempt its re-establishment elsewhere; I looked over the list of those who had patronised my former attempts, and finding that the majority of my subscribers resided to the

\* This work, essentially necessary to every person concerned in agriculture, is entitled, "Practical Observations on the British Grasses: containing accurate Figures of the most approved Grasses for Meadow and Pasture Land; Hints for the Improvement and laying down of Land to the best Advantage; accompanied with a Descriptive Catalogue of all the British Grasses. Fourth Edition. To which is now added, (an high honour), A short Account of the Cause of the Disease in Corn, called by Farmers the Blight, the Mildew, and the Rust; by the Right Honourable Sir Joseph Banks, Bart. K. B. with permission."—Published by H. D. Symonds.

westward of the city, I fixed on a spot at Brompton, with the advantage at least of some experience in the cultivation of plants; and here I have witnessed a pleasure I had long wished for—that of seeing plants grow in perfect health and vigour.

That I have good grounds also to expect that my labours will be crowned with success, the list of those persons who have honoured my garden with their subscriptions the first year of its formation, affords me the most pleasing proof. Indeed, whilst vegetables shall constitute a part of our food, and there is a necessity to distinguish wholesome from poisonous ones—whilst medicines for the cure of our diseases shall be drawn from the vegetable kingdom—whilst agriculture, the grand source of the wealth and strength of all nations, shall be capable of being improved by a closer attention to our native plants—whilst botany shall be studied as an instructive science, or as an object of rational amusement—or, whilst the beauties of nature shall have power to charm;—so long a garden, on the plan of the one I am endeavouring to establish, will, I humbly presume, meet with the support of the public.”

The situation chosen was admirably adapted for the purpose. The grounds lie open to the south and west, except where the plantations are intended to exclude the sun, while the north-east wind, by being impregnated with the ignited air of the capital, loses much of its sharpness, and becomes far less pernicious than it would otherwise be to such plants as require a bland and genial climate. The extent is about three acres and a half, including the ground occupied by the hot-house, green-houses, and library; and seven acres more, immediately adjoining, and now in the occupation of the proprietor, is appropriated for experiments in agriculture.

Just a mile and a half distant from the turnpike of Hyde Park, is this English Eden, neat and ornamental. A stately door, on which is written, “**BOTANIC GARDEN, OPEN TO SUBSCRIBERS,**” attracts the notice of each passenger. From this door, at which a porter constantly attends, a broad gravel walk, extending across the garden, presents, on each side, a parterre, in which all the



different varieties and beautiful hues of Flora are exhibited, in all their varied charms :

“ Along these blushing borders, bright with hue,  
“ Fair-handed Spring unbosoms ev'ry grace.”

The plan then adopted in laying out the ground (and since pursued) was as follows :

No. 1. Is the **MEDICINAL** quarter. It is placed first, as being the most important consideration. Remembering those diseases “ human nature is the unhappy heir to,” the heart exults to see assembled together those remedies afforded by the vegetable kingdom; and the practitioner easily and quickly learns also to distinguish the poisons, which a want of knowledge sometimes proves fatal to those who employ them. Others should also learn them, in order to point them out to their children.

No. 2. Is the **AGRICULTURAL** quarter. Here are seen all the plants, so friendly to man! cultivated in the fields. The beneficence of the Deity is here conspicuous, in giving food to his creatures; but industry is required on the part of man, and therefore, in the same quarter, are to be found the plants noxious in agriculture. By experiments, the soils best adapted to the growth of particular plants can be ascertained; likewise the best modes of extirpating our enemies, when they are known.

No. 3. Are the **FOREIGN GRASSES**. How far these can be successfully naturalized, will be ascertained from this quarter.

No. 4. Are the **BRITISH GRASSES**. It is remarked, that no colour is so adapted to the organ of vision as green. Here the botanist will admire the infinite diversity, and notice the soils peculiar to each species. As the parts are minute, the eye gets familiarized to the particular habit of each, and can readily, after a little use, discriminate each species by mere inspection. From such an assemblage, also, the nice discriminations are soon learnt, not to be acquired under any other circumstances.

*Observation.*—The shady walk is made of poplars, which inarch, so as to form a complete bower, impenetrable to the rays of the sun.

No. 5. Contains BRITISH PLANTS OF A MODERATE GROWTH. This division is very advantageous to the student, who has not occasion here for the use of a glass, and can study best in those wild plants, native of the country, the Linnæan system.

No. 6. Are the BRITISH TREES AND SHRUBS, which make a very agreeable shady walk in the summer months, when the student can, at the same time, examine the leaves; manner of growth, and fructification.

No. 7. Are the BRITISH PLANTS OF SMALL GROWTH, and AQUATIC PLANTS. These are elevated on a stage built on purpose, to prevent the necessity of the student stooping to examine their habit, and for the easier plucking the fructification. These very properly come at the end, after the study of plants of easier construction.

No. 8. Is the GREEN-HOUSE and HOT-HOUSE. Here the student is delighted to see the denizens of another zone, preserved by the ingenuity of man, imitating the nature of each climate of the globe; and the sumptuous robes of the East, and West, and South, are displayed in all their dazzling beauty and variety of forms. The parts of fructification, even here, under certain circumstances, are allowed to be examined into:

No. 9. Is the LIBRARY. A table is spread out the whole extent, covered with green cloth, for examination of the flowers gathered in the garden, and the study of them in the several works descriptive of plants. Every work of importance, in this branch of science, is to be met with here: and the student may fancy himself a thousand miles from London, only occasionally interrupted by the melody of songsters in the Aviary. To render this place still more a place of retreat, opposite to where are the British woods, the most ornamental trees and shrubs, and fragrant plants, are planted, which form an agreeable shade, well adapted to favour study.

No. 10. Are the DIFFERENT SPECIES OF HEATH. The variety of these are so great, that it required a place apart from the green-house, for the study of the several kinds.

No. 11. Are the BULBS. This is a quarter of extraordinary beauty, and exhibits the sportings of nature in the vast variety of these. "Is SOLOMON in all his glory arrayed like one of these?"

*Observation.*—The shady walks have been before noticed; and the Lombardy poplar is converted into another use: it forms the hedges, from the shears trimming the foliage, thus dividing the different quarters, enclosing them, and serving as an admirable screen to each.

No. 12. Are the FOREIGN ANNUAL PLANTS. It was necessary to separate these from the others, in order to gather the seeds, which are required to be preserved for another year.

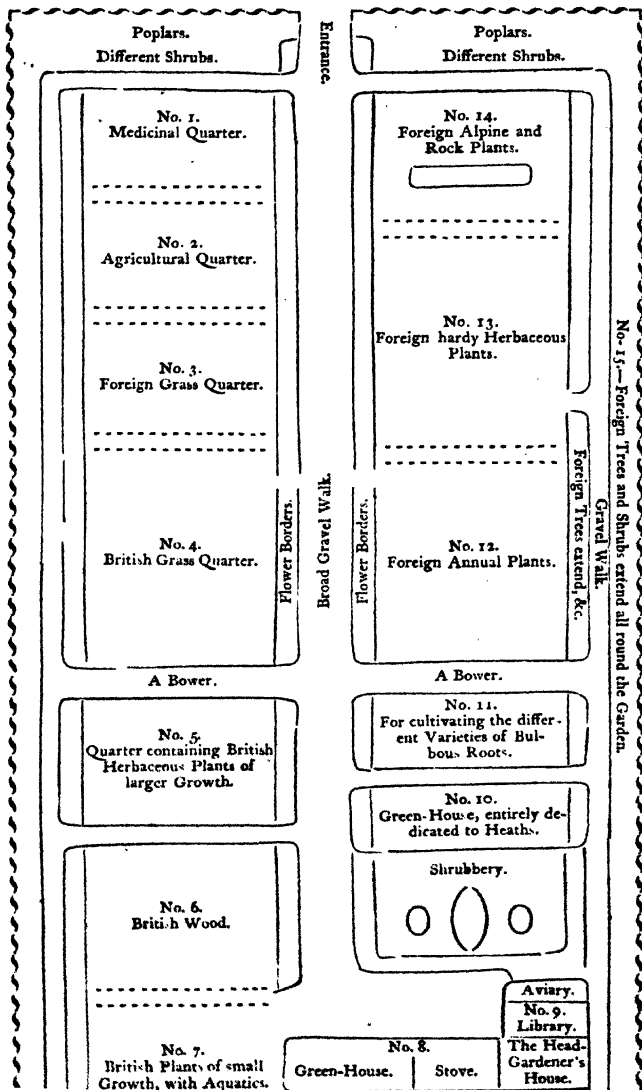
No. 13. Are the FOREIGN HERBACEOUS PLANTS. This is arranged after the sexual system, and are the most beautiful living examples of the several classes and orders, and sufficient in number to acquire, with the help of Linnaeus's works, or any of the Introductions to Botany, a perfect knowledge of classification, and, with the other quarters, also the several genera and species of plants.

No. 14. Are FOREIGN ALPINE, OR ROCK PLANTS; that is, plants of small growth, raised upon a stage, as were the British of small growth.

No. 15. Surrounding the whole, are all the TREES AND SHRUBS, which are able to be naturalized in our climate, and which beautifully decorate, shade, and screen the whole. The surrounding gravel walk, admirably contrasts with the large central open walk before described.

This garden will be perhaps better understood in the annexed plan.

A PLAN OF THE BOTANIC GARDEN AT BROMPTON.



The CULINARY quarter, which was in the Lambeth garden, for promoting the cultivation of the several varieties of edible plants, or their seeds, is here omitted, as also the orchard,; but these certainly demand consideration, and are of national importance, considering their universal utility, but as requiring a greater extent of ground, and the employment of more hands, was probably, on that account, omitted, especially at the outset of this establishment\*.

Having thus established, according to his own mind, the Botanic Garden, he became sunk in spirits, and indolent; I would rather say disappointed. He had enough of money, but felt that he had completely forsaken his darling offspring. Yet he sighed not after his *Flora Londinensis*, as may be thought by some, but his nobler scheme, alone adequate to gratify the capacity of his enlarged soul, the *History of the Natural Productions of Great Britain*; and Mr. Edwards was often called aside to depict the birds, nest, and eggs, the insects, and dissections of British plants, all referring to this original idea †.

During this period, the author of this *Life* was his companion in many herbarizations; and when collecting the wild plants and grasses of different districts, he saw his heart kindle at the sight of our native riches, and his whole countenance became illuminated. When discoursing upon these, he glowed with youthful fire, and the once burning passion rekindled, like the lost spirits of Priam; but it was soon doomed, in his Botanic Garden, at Queen's Elms, Brompton, to settle into a melancholy gloom.

The worm cancered at his heart; but his actions alone

\* The model for a public garden is that of Mr. Swainson's at Twickenham. The whole is in serpentine lines, and combines the purest taste with the utmost perfection of science. The extent is six acres, and includes all the above-mentioned quarters, and is open, as well as his magnificent botanical library, to every cultivator of the science, with a liberality and heartiness that reflects on this gentleman the highest credit.

† I was lately favoured with a sight of many hundred original finely executed drawings of the birds and animals of Great Britain, bequeathed by Mr. William Curtis to his son-in-law, a florist of high reputation.

manifested his ambition, that towering and laudable ambition, which, if a fault, was his only one. He scorned to reveal his real state of mind, even to his nearest friends. Often would he take up Pennant\*, and Berkenhout†, with a sigh, and knowing what he could have himself accomplished, fearful of plunging again into embarrassments, by fits and starts alone he re-assumed his darling project, which he again as suddenly relinquished.

The lucrative monthly *Botanical Magazine* he stuck to, but as a drudgery; the unproductive *Flora Londinensis* went on like a funeral; he felt his constitution undermined, not by age, but from disappointed expectations; the lecturing and herbarizings he gave up; and the only part of his realized ambition (the *Botanical Garden*) but brought to his recollection, it was a fugitive wing of a mighty fabric!

To secure this part to the British nation as far as was possible, he associated as his partner a pupil and assistant of very promising hopes. It is but justice to add, that this *Botanic Garden*, at *Queen's Elms*, *Brompton*, has been continued since the death of *Mr. Curtis*, with all his improvements, and many additions; and, much to the credit of *Mr. Salisbury*, it has not lost any of its recommendations, originally derived from *Mr. Curtis*. A more general encouragement is alone wanted, to render it the very first garden, in point of productions, in Europe.

The reader may here expect us to say something on the character of *Mr. Curtis*. No one ever shewed, from the earliest period, a greater love for botany, or ardour in its pursuit, than *Mr. Curtis*. His eye was truly microscopic;

\* The author of the *British Zoology*.

† Vide *Synopsis of the Natural History of Great Britain and Ireland*, containing a systematic arrangement and concise description of all the animals, vegetables, and fossils, which have hitherto been discovered in these kingdoms. In the preface to this work, *Berkenhout* says,

"I am particularly happy in acknowledging my obligations to *Mr. Curtis*; whose favourable opinion of these volumes was a principal cause of their republication, and the references to whose admirable *Flora Londinensis* hath so much improved the present edition of my book."

for seldom had he recourse to a glass to examine the smaller parts. Nothing escaped his remark, and his discernment was most critical. His descriptions of plants are therefore perfect. Neither too profuse, or contracted, these are models for our imitation. Able to draw himself, and engrave, which appear in him to be self-taught, he could direct the artist to express what he himself felt; and if ever he suffered his mind to be ruffled, it was when the painter had not fulfilled his part exactly to his mind.

He was patient of bodily labour, and careless of what he partook in his researches after plants. Bread and cheese and beer, or eggs, were his usual repast when herbarizing; and this chiefly with a view not to lose his time. He rapidly traversed on foot, considering his make, a prodigious extent of country, and he suffered nothing to escape him. It was wonderful the multitude of plants he found growing upon any spot; for when herbarizing with a large party, his keen sight always collected twenty times as many different plants as were obtained by the whole company. Although thus superior, no one was more modest or diffident. He never indeed boasted, and but seldom spoke of himself. When correcting an error, he performed the task in the handsomest manner, ever accompanying his remark with some previous compliment to the person. He was studious not to give offence. Truth was his delight, and he imagined all must willingly bow before her shrine. He may be said to be the founder of the only national work on English botany; for though he did not live, or rather was not encouraged enough, to accomplish what would have justly entitled him to that character, yet he has opened the road of glorious renown to some one, who will hereafter achieve what he has commenced. The fault, in not succeeding, cannot be imputed to him, but in the times. "*Magnis, tamen excidat ausis.*" He was, however, the precursor of the glorious lights of the present day; for he paved the way for the full reception of their labours. He impressed on the public a taste for the science of botany, although not then sufficient to maintain all his own works. He promoted, therefore, even his own contem-

porary rivals. His garden was the only public thing of the sort in England, which evinces his ardent endeavours for the science. All his works were original: the contrivance of them sprang entirely from his own mind. His sacrifice of a lucrative profession may be blamed by some; but he has apologized for this in the bias implanted by providence, for wise reasons, in different minds; and there is no lack of persons carrying on this honourable art. His attention to the grasses, his publication on the sea-kale, with his several works, evince a patriotic spirit ever glowing in his breast. He looked beyond this scene; for in none of these but he likewise recals us to that power and goodness whence all things proceed. His person was rather short, and thick-built; his dress was always uncommonly neat; his face was full and ruddy, and bespoke beneficence; health at one period glowed in his cheek. He possessed a politeness, intermixed with some formality; the approaches to him, therefore, were easy, but obligated not to be too free; but where he saw a desire of learning, he was the first to follow the student, and point out to him instruction.

To sum up the total: he was a sincere believer in Christianity, although it be doubted whether he died a Quaker. He was a true and faithful husband; an affectionate and tender father, to an only daughter, on whom he bestowed a most liberal education\*, and implanted the best principles; a kind and generous friend, disinterested in the extreme, although the want of encouragement drove him from the difficult path of true and lasting fame†; of that fame, which, if a

\* This lady is married to Mr. Curtis, florist at Walworth, and has two children.

† Having concluded the Life of Mr. Curtis, I should apologize for the freedom of my general remarks. Enthusiastically an admirer of the *Flora Londinensis* of Mr. Curtis, I have stated that the folio size is alone adequate to give a perfect knowledge of the growth of most plants. This opinion I still maintain; and however convenient it may be to the student in a small octavo, the larger plants lose greatly by any diminution, both as respects truth and beauty. Hence no work not of a folio size, however useful, can be said to be National. I do not, however, mean to say, that all folio works are national. Mr. Curtis's *Flora Londinensis*, Lambert's *Pines*, &c. &c. merit certainly that appellation.



fault, was his only one: and, to speak of him as we ought,

“ When shall we find his like again ? ”

SHAKESPEARE.

Here let the curtain of our narrative be dropt, and the sympathizing tear be shed on those beautiful lines, which are inscribed on the tomb-stone of Mr. Curtis, who departed this life, July 7, 1799, aged about 53 years :

While common herbs shall spring profusely wild,  
 Or gardens cherish all that's blithe and gay,  
 So long thy works shall please dear Nature's child,  
 So long thy mem'ry suffer no decay.

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