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The Tourist's Flora

A Descriptive Catalogue of the Flowering Plants and Ferns of the British Islands, France, Germany, Switzerland, Italy, and the Italian Islands

Joseph Woods

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OF

THE BRITISH ISLANDS, FRANCE, GERMANY, SWITZERLAND,
ITALY, AND THE ITALIAN ISLANDS.

BY

JOSEPH WOODS, F.A.S., F.L.S., F.G.S.

LONDON:
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1850.

INTRODUCTION.

THE intention of the present work is to enable the lover of botany to determine the names of any wild plants he may meet with, when journeying in the British Islands, France, Germany, Switzerland, and Italy. I have chosen these limits, as those of the countries most frequented by English tourists, and with the botany of which I was in some degree personally acquainted. To have extended them further, would have made my book more bulky, and, I am afraid, more imperfect. To accomplish this object, I had to keep in view two important particulars,—to make the descriptions clear and distinctive, and at the same time to condense the whole as much as possible, so that the work might be comprised in a single volume, of a bulk not inconvenient for the use of the traveller. The former object I have used no small pains to attain; in the first place by taking care, if by any means I could accomplish it, that my characters should always contain a *difference* at least sufficient to discriminate the plant from all others contained in this work. To this end I have been in the habit, in all the larger genera, of forming for myself an analysis of the genus; taking successively the most important characters, and dividing and subdividing upon them, till I arrived at the species. Where I could not succeed in this, I have taken each species in order, and compared it with those that follow; desirous that some character, good or bad, should serve to mark some sort of distinction. I have not found this always practicable, even in species derived from the same author; much less in those only noticed by different authors. In such cases, I have contented myself with translating the words of my author, and giving them as a quotation, with the writer's name at the end. Where the inverted commas therefore occur, they show, either that the description does not appear to point out any satisfactory distinction, or that there are parts of it which I do not fully understand, or that I do not feel confident that the plant does not occur under another name in other authors, or, lastly, that I doubt whether the plant be the one described by other authors under the same name. My reader cannot obtain from me

knowledge which I do not myself possess; but I am anxious to communicate to him everything that I know myself. Where I have added the name of the author, without marking the description by inverted commas, it denotes that the description is taken from that author alone; either because he alone has described the plant as existing within my limits, or at least that his is the plant I particularly refer to, whatever discrepancy may exist between his description and that of other writers.

It will be perceived from this account that the work has no pretensions to originality. My task has been to translate and harmonize, as well as I could, the descriptions of different botanists; and I have added the result of my own observations only where it seemed to be absolutely necessary: considering that to give my own view would often have only been, to add one more to opinions already too numerous.

It will be found that I have sometimes, in these pages, used certain words in a sense not generally adopted, or at least not generally explained. When Linnæus, in the 'Philosophia Botanica,' first gave names to the forms of leaves, he seems to have had little more in view than the comparative length and breadth. Succeeding authors have modified this considerably, but without giving any distinct explanation of these modifications. I have considered them as exhibiting two series of forms. *Round*, *oval*, *oblong*, *linear*, are essentially obtuse or subobtuse; and always so to be understood, unless the contrary is expressed. *Elliptic* and *lanceolate* are in the same manner to be considered acute or subacute. The *oblong* leaf of the 'Philosophia' is a very eccentric oval; but Linnæus himself, in practice, seemed inclined to limit it to a form which exhibited some degree of parallelism on the two sides; and later writers have adopted this latter interpretation; sometimes almost without reference to the comparative length and breadth of the object. Thus Bentham, in De Candolle's 'Prodromus,' describes the seeds of Euphrasia as oblong, though the length is not much greater than the width; and Koch calls the divisions of the leaves of some species of Carduus and Cirsium oblong, where the length of the undivided portion, to which alone the term can apply, is hardly equal to the width. *Oblong*, as applied to the whole leaf, still, however, I think, indicates a length of four or five times the width (though in the figure in the 'Philosophia' it is hardly three times); and in this way I have employed it.

Elliptic has been used by botanists in two different ways. It is applied to the regular mathematical ellipsis, which I have called an oval; and to a form like the symbolical fish of the middle ages, produced by two curves, each less than the half of a circle, or of a true ellipsis, and uniting in an angle at each end. It is in this sense alone that I employ it. My first notion was to keep to the mathematical use of the term; but the difficulty of finding a suitable name for the latter form,

a very common one among leaves, prevailed upon me ultimately to call the first an oval and the last an ellipsis. Linnæus describes *elliptical* or *oval* as a form whose length exceeds the breadth, "superiore et inferiore extremitate angustiore," a phrase which would at least include my *elliptic*, if it does not limit the sense to that form. Lindley says that *oval* or *elliptic* differs from *oblong* in being acute at each end. *Lanceolate* is only a narrower form of elliptic.

Thus we have, in the blunt series, *subrotund*, where the length is less than $1\frac{1}{4}$ times the breadth; *oval*, where it is from $1\frac{1}{4}$ to 4 times; *oblong*, between 4 and 8 times; *linear*, 8 or more times. I should, however, call a leaf *oblong* if the sides were distinctly parallel, even though the length were hardly twice the breadth. Linnæus, in the 'Philosophia,' has introduced the word *ligulate* or strap-shaped, but has hardly made any use of it. Perhaps it would be advantageously employed for a form between oblong and linear, restricting the former within narrower limits. In the acute series, we have only *elliptic*, from $1\frac{1}{4}$ to 3 times the breadth, and *lanceolate*, where the length is more than three times the breadth.

All these forms are further distinguished, when needful, by the addition of the terms *broad*, *exact* (*exquisitè* of Bertoloni), and *narrow*. De Candolle seems to have taken a fixed type for each form; and he designates as *compound* all deviations from it. It is, however, more convenient to admit a wide variety of proportion under each term, and to use the compound only when the form is so intermediate that we can hardly tell which word ought to be used. I will add here, that a compound epithet indicates an intermediate, and not a compound form. Thus *ovato-lanceolate* is not ovate at the bottom and lanceolate at the top, but in all parts intermediate between ovate and lanceolate. *Spatulato-* is an exception to this rule; a spatulato-ovate leaf being a spatulate leaf of which the blade is ovate. In this, I believe, I follow the usual practice, but I do not know that it is anywhere distinctly explained.

Cordate I consider as ovate with an indentation at the base. *Cordato-oblong* would therefore indicate a leaf between ovate and oblong, indented at the base; and *oblong with a cordate base*, a strictly oblong leaf with such an indentation.

Triangular has been used ambiguously, because it is not explained whether the angle at the base is included in the number. I understand by it a form nearly triangular, where the stalk is attached to one of the sides (fig. 16). Where the insertion of the stalk also forms an angle, but where the upper and lower parts of the leaf are very unequal, it becomes *deltoid*, and this is the way in which I think Linnæus used the word; though his definition will not, perhaps, bear a critical examination, and his figure in the 'Philosophia' does not represent a leaf at all corresponding with the general use of the word. *Rhomboid*, or rather *rhombic*, is where the lateral angles are nearly equally distant from the summit and base.

Thus, in fig. 16 the outline is that of a triangular leaf. The lower thinner lines *a a* would reduce it to a deltoid, and the upper *b b* to a rhombic form.

An *acute* angle, geometrically, is one which is less than a right angle. Botanically, however, the angle at *a* (fig. 17), which is a right angle, would be called *acute*. There are in this respect two particulars to be noticed, for which, perhaps, our botanical terms are hardly sufficient:—whether the object described terminate absolutely in an angle, and whether that angle be obtuse or acute. *Rounded at the end* is sometimes employed to express a form where the angle is not quite completed, and sometimes where a semicircle is formed on nearly the whole width of the leaf. I have rather avoided the term, unless where the context limits the meaning. *Attenuate*, when used alone, indicates with me a form narrowed *at the base* and somewhat prolonged, exactly corresponding with *acuminate* at the summit. *Attenuate at both ends* is attenuate and acuminate. I find sometimes a distinction between attenuate and acuminate, both as applied to the summit of a leaf; but I do not know what is meant by it; nor have I any distinct idea of what is intended by *acutatus*, a word frequently introduced by Kunth. De Candolle sometimes uses the word *acuminate* where there is no reversed curvature, and where I have employed the expression *finely acute*.

Besides these limitations of meaning in words generally adopted, I have introduced two or three not usual in botanical descriptions. One of these is *prolonged*, as applied to mark a form differing from *acuminate* by a prolongation of the upper part of the leaf without any reversed curve. Thus the shortest and bluntest form (fig. 15) I call simply *cordate*; with the little point above, it becomes *cordate, acute*; with the inner prolongation, it is *cordate, acuminate*; and with the outer, *cordate, prolonged*. In like manner, the inner thin line at the base is *cordate, attenuate*; the second would make the stalk become a *haft*; and where the membranous margin is wider, the leaf becomes *spatulato-cordate*.

The word *Haft*, used in the above sentence, I employ to denote a leaf-stalk accompanied by a membranous margin. Such a stalk is sometimes said to be winged, and sometimes is considered as making part of a spatulate leaf. Some genera, and even some natural orders, have no true leaf-stalk, and what has been usually so called is properly a haft.

Oval and *lanceolate* are forms alike, or nearly alike, at each end (*de minimis non curat botanicus*), *ovate* and *cordate* are not so; and hence the use of the words *obovate* and *obcordate* where the greatest breadth is upward. Bertoloni uses the expressions *obversely lanceolate* and *obversely oblong*, meaning apparently a lanceolate or oblong leaf, of which the widest part is a little above the middle, yet not so much so as to be called obovato-lanceolate or obovato-oblong. The reader may, perhaps, find this term preserved in descriptions taken from the 'Flora Italica.'

Another word, little if at all used by botanists, though admitted by Linnæus into the 'Philosophia,' is *parabolic*. I have applied it chiefly to the divisions of the calyx, when the somewhat curved sides and obtuse termination render the word *triangular* improper; and as these portions are not at all rounded at the base, but gradually contracted from the bottom to the top, they cannot be considered as ovate. The term *parabolic* can only be applied to objects which rise from a broad base, and not to a stalked leaf; and I may add, what I believe is not noticed in our glossaries, that the term *subulate* also implies an expanded base. Linnæus defined *subulate* as linear below and tapering above; but I believe in general it means a very narrow triangle. The leaves of *Ulex europæus* are described as subulate, though they form nearly an equilateral triangle; and if they were placed on a stalk, instead of rising from the stem on their whole width, they would be called triangular. By *setaceous* I understand a still narrower triangle, and a finer point, than is the case in *subulate*.

Acuminate is an extension of the membrane of the leaf; *mucronate*, a prolongation of the midrib beyond the membrane; *cuspidate*, a hardened extremity, arising sometimes from a combination of the nerves, sometimes from a thickening and induration of the membrane; but never a mere prolongation of the midrib. This, I believe, is consonant to the general practice where the terms are distinguished, but they are often confounded. I have adopted from Palisot de Beauvais the difference of seta and awn, as far as I could distinguish them. The latter is a prolongation of the midrib, differing from mucro only in its greater length. The former comprehends all other lengthened points, and those which, though connected with the midrib, separate from it readily.

We frequently meet with the word *Outline* in botanical descriptions, denoting the general form of a divided leaf, such as it would be if the interstices were filled up. It sometimes happens that the divisions are so far separate as readily to suggest the idea of a form produced by cutting them away. This I have called *Inline*.

Scaber and *asper* are very frequently confounded. I adopt the distinction given me by a botanical friend. The blacksmith's hand, says he, is *scaber*; his chin in the latter part of the week is *asper*.

Lineate (lineatus) seems to imply that the conspicuous veins branch from the midrib in continued parallel lines. The term is not new, but it is not common. Lindley considers it as synonymous with *striate*.

Ciliate and *fringed* are closely allied; but the first indicates a border of hairs; the latter, that the substance of the membrane is divided into narrow segments.

Pubescent seems sometimes employed to denote hairy in any way, at other times to correspond with *downy*. I understand it in the former sense.

Withering adopted the word *Cup*, as the English of calyx; I have sometimes

employed it to designate the undivided part of the calyx, when too open to be called a tube.

I have used the word *Phyllaries* for the parts in the Compositæ which were considered by Linnæus as the leaves of the common calyx, and by later writers as the bracts of an involucrum; but I wanted the words *bracts* and *scales* to indicate parts external to this calyx, and the Greek word *phyllarion*, signifying a little leaf, seemed to furnish just what I wanted.

In describing the Compositæ, besides introducing the word phyllaries, I have called *Crest*, that ornament to the seeds which is named *down* by Smith, and *pappus* by Hooker; and I call the parts of which it is composed, *shafts*, which may be chaff-like, hair-like, or feathery.

Perhaps the terms *compressed* and *obcompressed*, though not introduced by me, may not be familiar to the student. Seeds are said to be compressed when the greatest diameter is in the direction of the rays, from the centre to the circumference of a compound flower; obcompressed, when the greatest diameter is at right angles to that direction. In fig. 18 the seeds are compressed; in fig. 19 obcompressed.

The word *fertile* is used in this work for flowers containing the pistil but no stamens, and producing seeds. Where from such a flower no seeds are produced, it is called *unproductive*. *Barren* flowers have stamens and no complete pistil. *Neutral* flowers, or florets, have neither stamens nor pistils. *Complete* flowers have all the essential parts.

Cyme has been used by modern botanists to denote two very different modes of inflorescence. One is, according to the definition given by Linnæus, an umbel whose rays are irregularly subdivided, as in Sambucus, Cornus, &c.; the other, for an arrangement which is frequent among the Caryophyllaceæ and in *Rosa*, where opposite branches spring on each side of the primordial flower, and again from the secondary flowers produced on these branches. The first is indefinite both as to the number of flowers and the order of their expansion. The second is essentially centrifugal, and the number of flowers is typically 3, 7, 15, 31, each increase being one more than the double of the preceding.

Botanists have used the word *Joint*, and its corresponding Latin word *Articulus*, as signifying the point of union of two different parts, or the space between those parts. For the first I use the term *Joining*; and when I say that a leaf is *joined* to its stalk, or the upper part of an awn or of a stem to the lower, I mean that the parts are not perfectly continuous, but exhibit a distinguishable point of junction. *Joint* is used as it is in common speech, when we talk of a *joint* of meat, &c., for the parts so joined.

I have used the word *Gusset* in the Umbellatæ, to denote the triangular filling in, in some genera, between the round kernel and its semiround covering.

When of two parts, each measured from its own extremities, the dimensions are equal, I have used that term; but it not unfrequently happens, by the position of the parts, that the shorter may extend as far, or farther, than the longer. In that case it is *equalling* or *exceeding*. Thus, in some of the Cruciferæ the blade of the petal is shorter than the sepal, which it nevertheless by its position exceeds. The labels of some of the Orchideæ will also afford examples of this sort. In the same manner I distinguish, when needful, between *shorter than* and *falling short of*.

Besides **a.** for annual, **b.** biennial, and **p.** perennial, I have employed **w.** for woody, where the plant is so small that it would not in common speech be called a shrub, although the substance indicates such a nature. The genus *Helianthemum* offers abundant examples to explain my meaning. **s.S.** is small shrub, **l.S.** large shrub, **s.T.** small tree, **l.T.** large tree: terms which I think will be sufficiently intelligible, without fixing on any precise number of feet, which, in a character so variable as size, is more likely to mislead than assist the inquirer.

In the localities given, there are also one or two peculiarities, independent of the abbreviations. By *Shore*, without any addition, I mean the sea-shore, the part more or less influenced by the salt atmosphere; by *Coast*, a large extent of country, affected by the more even temperature of the sea, but not by its salt. I use the name of the river for the valley drained by it. I leave out the words *place*, *soil*, &c., as easily supplied by the reader, who will find that in many other cases I have omitted words necessary to make the sentences flow freely, where there can be no difficulty in supplying them. Thus, *cult.* means cultivated ground; and I have used *uncult.*, not for heaths and districts entirely in a state of nature, but for fallows, hedge-banks, waysides, and such places, where previous or neighbouring cultivation has fitted the ground for the reception of seed. *Alps* and *alpine* are applied exclusively to the high range extending on the north of Italy and into Germany, and not figuratively to other high mountains; unless, for want of some other appropriate name, I may in one or two instances have retained Bertoloni's name of Apuan Alps, for the range of mountains between the valley of the Serchio, and Massa and Carrara.

De Candolle made use of a note of admiration to his synonyms, to indicate that he had himself seen the specimen which authorized the name. With me it denotes a remarkable character, not met with in the allied species, or at least to be considered as not existing among them, unless where expressly mentioned.

The characters of the natural orders are so little definite, that it is almost impossible for the student to determine a plant by them; and some writers have therefore thought it necessary to give a *clavis analytica* to assist his researches. I have thought the Linnæan system the best *clavis analytica*, and on this account

I have followed it in the arrangement of the genera, and have in that part been more full than is usual where the species are arranged according to the natural orders. After he has determined the genus, the student will find a direct reference to the species it contains, and I have headed my pages in a manner to make that reference as easy as possible. I here, however, subjoin a slight sketch of De Candolle's arrangement.

According to this author, the Vegetable World is separated into two large divisions. In the first, the structure of the plants is partly made up of vessels or pipes; while in the second it is formed entirely of cells. These divisions nearly coincide with the Phanerogamy and Cryptogamy of the Linnæan system: except that the Ferns and Miscellaneæ of that system find their place in the first division of De Candolle.

This first division, which is all I have to do with in the present work, comprises three classes, Dicotyledonous, Monocotyledonous, and Cryptogamous.

Dicotyledonous plants, besides the character drawn from the seed, which is not always accessible, are distinguished by the branching and anastomosing veins of the leaves, and by the parts of the flower being four or five, or some multiple of these numbers. In woody plants they are more certainly marked by the structure of the trunk, which is composed of concentric layers, a new layer being added on the outside of the woody centre each year.

Monocotyledonous plants, on the contrary, have simple nerves, extending from one end of the leaf to the other, without branching into veins. The parts of the flower are threes or multiples of three; and in the larger and more permanent trunks, the growth takes place internally, and the section exhibits no concentric layers.

The Ferns and Miscellaneæ have no flowers.

These rules are subject to many exceptions. *Berberis*, *Leontice*, *Loranthus*, *Frankenia*, *Peplus*, and *Rumex*, have six stamens. The Cruciferæ have also six stamens, though only four petals. Several plants of different families have only a midrib, and there are consequently no anastomosing veins. In *Lathyrus Nissolia* the apparent leaf is very much like that of a grass.

On the other hand, among monocotyledonous plants, *Maianthemum*, and the European species of *Paris*, have four petals and as many stamens. *Arum*, *Calla*, *Smilax*, *Tamus*, *Ruscus*, *Paris*, have anastomosing veins. *Hydrocharis* and the Alismaceæ have two sets of nerves, or veins, crossing each other; one set proceeding from the base of the leaf, and the other from the midrib. In the Potameæ something of a similar structure may be observed; the principal nerves being united or crossed by veins nearly at right angles. I am not aware that this arrangement is observable in any dicotyledonous plant.

The Dicotyledons are divided by De Candolle into *Thalamifloræ*, *Calyciflorœ*, *Corolliflorœ*, and *Monochlamydeæ*. In the first, the stamens are inserted upon a re-

ceptacle which also supports the petals and the fruit. The sepals, if there are any, and the petals, are always separate and inferior.

In the *Calyciflorœ* the character is not so simple. The stamens are placed on the calyx, or on a ring which seems to support the calyx and the petals (which are always separate), and is quite detached from the fruit; or the germen is inferior or half inferior, and the corolla polypetalous; or the germen is inferior and the corolla monopetalous. The *Compositæ* are placed, I think, rather arbitrarily, in this division, for the stamens grow upon what is the only covering of a superior flower. If, indeed, we should admit the pappus, or crest, as a representative of the calyx, the coloured part would be acknowledged by all botanists to be a corolla, and the plants would belong to the *Corolliflorœ*; and if we do not admit the crest to be calyx, the order would rather belong to the Monochlamydeæ. The *Campanulaceæ*, *Vaccinieæ*, *Ericineæ*, and *Monotropeæ*, seem also forced into this class, since the stamens rise from within the corolla. The corolla being monopetalous will, however, easily distinguish them from the *Thalamiflorœ*; and the stamens being independent of the corolla, from the *Corolliflorœ*.

The *Corolliflorœ* have the stamens growing on the corolla, which is monopetalous; and there seems to be no exception to this rule, unless among the *Plumbagineæ* and *Plantagineæ*; and it was probably from the anomalous structure of these tribes that De Candolle was induced to place them among the *Monochlamydeæ*, though pointedly contradicting the character of this tribe.

The *Monochlamydeæ* do not include all dicotyledonous flowers which have only a single perianth. Several species, and even some genera, of the preceding orders, want a corolla, others want a calyx; and if, in compliance with the phraseology of many modern botanists, we call it a calyx where there is only one covering, this does not help us to determine whether the plant in question is monochlamydeous or not; nor can I point out to the student any way of obtaining this knowledge otherwise than by acquiring a familiarity with vegetable forms, and a degree of tact which will point out the probable relations of the one before him.

ABBREVIATIONS IN THE DESCRIPTIVE PARTS.

a. Annual.
Aut. Autumn.
b. Biennial.
Cal. Calyx.
Caps. Capsule.
Carp. Carpophore.
Cor. Corolla.
Diam. Diameter.
Div. Divisions.
Fil. Filament.
Fl. Flower.
Flt. Floret.
Fr. Fruit.
Germ. Germen.
Invol. Involucrum.
L. Leaf or Leaves.
Leg. Legume.
l.S. Large Shrub.
Lt. Leafit or leaflet.
l.T. Large Tree.
nat. Naturalized.
Nect. Nectary.
p. Perennial.
Pan. Panicle.
Pet. Petal.
Phyll. Phyllaries.
Pr. Prickles.
Pub. Pubescence.
R. Root.
Rac. Raceme.
Rec., Recept. Receptacle.
Rhiz. Rhizoma.
S. Seed.
S. Shrub.
s.S. Small Shrub.
s.T. Small Tree.
Segm. Segment.
Sep. Sepal.
Sp. Species.
Sta. Stamens.
Stip. Stipules.
T. Tooth or Teeth.
T. Tree.
Term. Termination.
Umb. Umbel.
V. Valve.
w. Woody.
The numerals after the mark of duration indicate the times of flowering.

LOCALITIES.

Calc. Calcareous.
Cult. Cultivated land.
Fds. Fields.
Grav. Gravelly soil.
Hgs. Hedges.
High means high in position.
Hths. Heaths.
mar. Maritime situations.
Mns. Mountains.
Mws. Meadows.
Pres. or Past. Pastures.
rich. Places of a rich soil.
Thts. Thickets.
uncult. Uncultivated land among cultivation.
Vyds. Vineyards.

GEOGRAPHICAL NOTICES.

Abr. Abruzzi.

adr. Adriatic: applied as an adjective to those parts of Germany and Italy which border on that sea.

Agde or S. Agatha. A town on the Mediterranean, in Languedoc.

Agrig. Agrigentum. The modern Girgenti.

Alba-longa. Opposite the modern town of Albano, on the lake of that name.

Albula. A mountain of the Grisons, separating the waters of the Inn from those of the Rhine.

Algau. A district in Swabia.

Alps, Apuan. A name given by Bertoloni to the mountains of Massa and Carrara. They consist chiefly of mica slate and of marble.

Alps, Cottian. Separating Dauphiné from Piedmont.

Alps, Julian. To the east and north of Trieste.

Alps, maritime. Separating Provence and the county of Nice from Piedmont.

Alps, Pennine. Separating Piedmont from Savoy, and from the Vallais. Mont Blanc and Monte Rosa belong to this range.

Alps, Rhætian. In the country of the Grisons.

Alps, Venetian. The range from the Lake of Garda, behind the ancient territory of Venice, and separating its waters from those of the Adige and of the Drave.

Als. Alsace.

Amiternum. An ancient town in the Abruzzi, near the modern Aquila.

Apenn. Apennines.

Apulia. A district on the Adriatic, comprehending the present Terra di Bari, and part of the Capitanata.

Aspramonte, near Nice.

Aust. Austria.

Auv. Auvergne.

Avezzano. In the Abruzzi.

Baldo. A high, and, botanically, very rich mountain, between the Lago di Garda and the Adige.

Belg. Belgium.

Boh. Bohemia.

Bord. Bordeaux.

Br. Britain.

Br. Isles. British Islands.

Britt. Brittany.

Brioni. An island near Fiume.

Bur., Burg. Burgundy.

C. Cape.

c. Central.

Cal. Calabria.

Carn. Carniola.

Capraja or Capraria. An island nearly half way between Corsica and Piombino.

Carin. Carinthia.

Carr. Carrara.

Cat. Catania.

Ceresole. Mountains or hills near Mantua.

Cev., Cevennes. A range of mountains north of Montpellier.

Corbières. Limestone hills near Narbonne.

Corni di Canzo. Two points in the Fork of the Lake of Como.

Cornu (Monte), or the Gran Sasso. The highest mountain in the Abruzzi, and reckoned to be 9,000 feet high.

Cor. or Cors. Corsica.

Cumray. Two islands in the Firth of Clyde.

Dau. Dauphiné.

Dax. Formerly Aquæ Tarbellicæ.

Dertona. Now Tortona in Piedmont.

e., alone, is put for eastern.

Eifel. The German part of the ancient Forest of Ardennes.

Eng. England.

Etrechy. A small town on the railroad from Paris to Orleans.

Eug. Hills. Euganean Hills: a small range south of Padua.

Eur. Europe.

F., Fr. France.

Fiume. A city belonging apparently rather to Hungary than to Germany, but its Flora is included by Koch in that of Germany.

Flor. Florence.

Franc. Franconia.

Friuli. Forum Julii, in the N. E. of Italy.

The same Latin name also belonged to the town now called Fréjus, in the S. E. of France.

Fusaro. A lake near Naples, said to be the ancient Acheron.

G. or Ger. Germany.

Garg. Gargano: a hilly, down-like promontory on the Adriatic side of the Kingdom of Naples.

Gasc. Gascony.

Gemmi. A Swiss mountain between the Oberland of Berne and the Vallais.

Gen. Genoa.

Gorgona. A small island about thirty miles from Leghorn.

Grimsel. A Swiss mountain separating the waters of the Aar and Rhone.

Guadagnolo. A small town situated high up among the hills to the E. of Tivoli.

H. Holland; *i. e.*, the present kingdom.

Halle. There are four towns of this name: one in Thuringia (Saxony), one in the Tyrol, one in Würtemberg, and one in Belgium.

Hallstadt. A town in Austria proper, on a lake of the same name, buried among high mountains.

Han. Hanover.

Heiligen Blut. A convent high up on the Great Glockner.

Hols. Holstein.

Ir. Ireland.

Is. Isola or Island.

Ist., Istr. Istria.

It. Italy.

Jap. Japygia, or Terra di Otranto: the S. E. extremity of Italy.

Joux. A village and small lake in the Pays de Vaud, amongst the ridges of the Jura.

Juvenal (Port) at Montpellier. The point to which the wool from Barbary and the Levant is brought, to furnish the manufactures of Montpellier.

K. Nap. Kingdom of Naples.

La Ciodad. A small town S.E. of Marseille.

Lampedusa. A small island S. of Malta.

Lang. Languedoc.

Laus. Lausanne.

Lig. Liguria, the Genoese territory.

Lomb. Lombardy.

Lorr. Lorraine.

l. Sax. Lower Saxony.

Luc. Lucania: a large district extending between the Bays of Salerno and Policastro to the Gulf of Tarento.

Mad. Madonie: calcareous mountains in Sicily; anciently Nebrodes.

Majella. A mountain in Abruzzi, S. of Sulmona, and between the sources of the Sangro and Pescara. Estimated height, 8,500 feet.

Maretimo. An island on the W. of Sicily.

Marschlins. A town in the Grisons, not far from where the torrent Landquart falls into the Rhine.

Mars. Marseille.

mdt. Mediterranean; generally used as an adjective.

Mil. Territory of Milan.

Miseno. A promontory near Naples.

Mt., Mte. Mount, Mont, Monte, Montagna.

Mte. Cornu, or the Gran Sasso, 9,000 feet. The highest mountain in the Abruzzi.

Mte. de' Fiori. On the borders of Umbria and the Abruzzi; about 6,000 feet high.

Mont Louis. A town in the Eastern Pyrenees.

Montagne della Sibilla, in Umbria. Monte Vettore, the highest point, is reckoned to be 7,000 feet above the sea.

Monte di St. Angelo. Near Naples.

Montigno. Among the Apennines of Camerata.

Mor. Moravia.

Mtp. Montpellier.

n. North or northern.

Nap. Naples, *i. e.*, near the city.

Narb. Narbonne.

Nebr. Nebrodes. See Madonie.

Nicolaithal. A valley descending from Monte Rosa and the Matterhorn to the Vallais.

Norderney. An island on the N. of Germany, not far from Embden.

Novarese. The district of the town of Novara between Turin and Milan.

Osero. An island in the Gulf of Fiume.

Pal. Palermo.
Palat. The Palatinate of the Rhine.
Pdm. Piedmont.
Penn. Alps. See Alps.
Peregrino. A limestone hill near Palermo.
Pic. Picardy.
Picenum. A district on the Adriatic, stretching S. from Ancona.
Plelan. A town in Brittany surrounded by forests.
Pom. Pomerania.
Prov. Provence.
Pyr. Pyrenees.

Raefel. A mountain in the Vallais.
Reg. Reggio, or Rhegium.
Rhine. I use the name of the river to indicate the valley in which it flows from Basle to Cologne.
Rhone. I use this in like manner for its valley from Fort l'Ecluse to Arles.
Rieseng. Riesengebirge, or Sudetes.
Rio Sacro. Near Camerino, betweeu Foligno and Loreto.
Rous. Rousillon: now the department of the E. Pyrenees.

s. South or southern.
S. Lucie. A peninsular salt marsh near Narbonne.
S. Michele. A town on the west of Sicily.
S. Victoire. A mountain in Provence.
Salève. A high limestone hill near Geneva.
Salzb. Salzburg.
Samnium. The ancient territory of the Samnites, on the frontiers of the Roman and Neapolitan States.
Sard. Sardinia.
Sasso Grande. See Monte Cornu.
Sav. Savoy.
Sax. Saxony.
Sc. Scotland.
Scaphusia. Schaffhausen.
Serini. Mountains near Lago Nero in Lucania.
Shet. Shetland Islands.
Sic. Sicily.
Sil. Silesia.
Sol. La Sologne; a low, barren, sandy district on the S. of the Loire.
Sorricinium. Near Carcassonne.
Sty. Styria.
Sud Sudetes or Riesengebirge, between Bohemia and Silesia.
Sw. Switzerland.
Sylva Sacra. A sandy tract, mostly woody or bushy, on shore of the Mediterranean, S. of Rome.
Syr. Syracuse.

Tavolara. An island on the N.E. coast of Sardinia.
Tess. The Canton of Tessin or Ticino in Switzerland, on the S. side of the central ridge of the Alps.
Thur. Thuringia.
Tiv. Tivoli.
Tyr. Tyrol.

Umbria. I apply this name to the mountainous district, within the Roman States, N.W. of the Abruzzi.

Val. Valley.
Vall. Vallais.
Valt. Valtelline: the valley of the Adda above the lake of Como.
Vaizelay. A town in the department of the Yonne, on the upper part of that river.
Veglia. An island in the Gulf of Fiume.
Ventous. A calcareous mountain about 6,000 feet high, N.E. of Avignon.
Ver. Verona.
Vettore. The highest point of the mountains of the Sybil.
Viesti. A town at the foot of Mte. Gargano.
Vigan (Le). A town at the foot of the Cevennes.
Vosges. A range of mountains in Alsace. The main ridge is granitic.

w. West or western.
Westph. Westphalia.

Zermatten. A town in the Nicolaithal.
Zweibrücken. Also called Deuxponts.

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GENERA.

I. MONANDRIA.

I. MONOGYNIA.

774. **CANNA.** Cal. 3-leaved. Cor. 6-partite, erect. Anther adnate to the margin of a petal-like filament. CANNACEÆ. SCITAMINEÆ of Linn. p. 356.

234. **HIPPURIS.** Cal. a slight border. Cor. 0. Nectary inferior, naked. Stigma 1. *Upright aquatic plants, with whorled L., and naked axillary flowers.* HALORAGEÆ. p. 127.

693. **SALICORNIA.** Cal. tumid, undivided. Cor. 0. Stamens 1 or 2. Seed 1, invested with the calyx. *Succulent plants, mostly jointed, and without L.* CHENOPODIEÆ; included in the HOLORACEÆ of Linn. p. 315.

755. **ZOSTERA.** Fl. in two rows, on a Spadix included in a long sheath, formed in the base of the L. No Cal. or Cor. Stigmas 2. Drupe 1-seeded. *Long, slender, floating herbs, with very long, flat, attenuate L.* POTAMEÆ.
The class to which this genus belongs seems uncertain, as there is no absolute connection between the anther and germen. Hooker placed it in *Monœcia.* p. 349.

II. DIGYNIA.

233. **CALLITRICHE.** Cal. 0. Pet. 2, inferior, sometimes wanting. Seeds 4, compressed, bordered. Fl. not all complete. *Floating plants. Fl. small, axillary. L. opposite.* HALORAGEÆ. p. 126.

691. **CORISPERMUM.** Cal. 0. Pet. 2. Seed 1. *Annual plants, somewhat rigid, with undivided L., and inconspicuous, axillary flowers. There are sometimes* 2 *or* 3 *stamens.* CHENOPODIEÆ. p. 315.

374. **CENTRANTHUS.** Cal. superior, with an entire, involute border. Cor. of 1 petal, 5-lobed, spurred. Seed with a feathery crest. *L. opposite, glaucous.* VALERIANEÆ. p. 169.

692. **BLITUM.** Cal. 3-cleft. Pet. 0. Cal. swelling into a berry and investing the single seed. CHENOPODIEÆ. p. 315.

914. **PSILURUS.** Glumes 1 or 2, minute. Spicules 1-flowered, imbedded in a rachis. Pales of equal length, the outer with a terminal seta. GRAMINA. p. 420.

II. DIANDRIA.

I. MONOGYNIA.

A. *Flowers inferior, monopetalous, regular* (*wanting in* Fraxinus 1, 2). *Shrubs, or Trees, with opposite L.* JASMINEÆ.

536. **JASMINUM.** Cor. salver-shaped; border 5–8-parted. Berry with 2 knobs and 2 cells. Seeds solitary, with an arillus. *Slender, flexible Shrubs. L. compound. Stalks many-flowered.* p. 244.

535. **LIGUSTRUM.** Cor. 4-cleft. Berry with 2 membranous, 1–2-seeded cells. *Branches round. L. undivided. Fl. white, in terminal panicles.* p. 244.

534. **PHILLYREA.** Cor. 4-cleft. Berry with 2 brittle, 1-seeded cells, one of them generally abortive. *L. undivided. Fl. greenish, clustered, axillary.* p. 244.

533. **OLEA.** Cor. 4-cleft. Drupe with a stony nut and 1–2 seeds. L. undivided. *Fl. in axillary racemes.* p. 244.

537. **SYRINGA.** Cor. 4-cleft. Caps. 2-celled. Valves boat-like. *L. undivided. Fl. in opposite panicles.* p. 244.

539. **FRAXINUS.** Cor. 0 or 4-partite. Caps. compressed, winged, with 1 or 2 seeds. Some Fl. imperfect. *Trees, or large Shrubs, with pinnate L., except in a var. of* F. excelsior. p. 244.

B. *Fl. inferior, monopetalous, irregular. Caps. 2-celled.* SCROPHULARIACEÆ. PERSONATÆ of Linn.

603. **VERONICA.** Cor. rotate, 4-cleft; the lowest Div. smaller. Caps. compressed, 2-celled. *Herbaceous or woody. L. entire or indented, not compound, opposite.* p. 267.

602. **PÆDEROTA.** Cor. ringent, spurless: mouth naked. Sta. longer than corolla. *Herbaceous. L. opposite. Fl. in terminal racemes.* p. 267.

600. **WULFENIA.** Cor. ringent, spurless: mouth bearded. Fil. very short. *Herbaceous. L. undivided. Fl. in terminal racemes.* p. 267.

595. **GRATIOLA.** Cor. slightly ringent, resupinate. Fil. 4, 2 of them barren. *Marsh-loving Herbs, with opposite L. and solitary, stalked, axillary Fl. Cal. 5-parted, and with 2 bracts.* p. 266.

C. *Fl. inferior, monopetalous, irregular. Seed-vessel of* 1 *cell.* LENTIBULARIÆ. CORYDALES of Linn.

659. **PINGUICULA.** Cor. ringent, spurred. Cal. 5-cleft, without bracts. *Bog plants. Stem* 0. *L. entire: the margin rolled inwards.* p. 298.

660. **UTRICULARIA.** Cor. ringent, spurred. Cal. 2-leaved. *L. finely divided. Plant floating by means of bladders on the stem or L.* p. 298.

D. *Fl. inferior, monopetalous, irregular. Seeds* 4, *separate. Stems square. L. opposite. Fl. in whorls.* LABIATÆ. VERTICILLATÆ of Linn.

624. **LYCOPUS.** Cor. nearly regular. Sta. simple, distant. Cal. 5-cleft. Throat hairless. Seeds retuse. *Fl. small, numerous, sessile.* p. 284.

627. **ZIZIPHORA.** Cor. 2-lipped: upper reflexed, lower trifid, spreading. Cal. striate, with 5 teeth: mouth bearded. *Small Herbs, resembling* Thymus. p. 286.

626. **ROSMARINUS.** Upper Lip of Cor. deeply divided. Fil. with a tooth at base! Cal. 2-lipped: upper entire; lower bifid. *Aromatic Shrubs, with a terminal whorled spike of Fl.* p. 286.

625. **SALVIA.** Cor. ringent. Fil. on a lateral stalk or connective. Cal. nearly campanulate. *Fl. in spikes, or racemes, composed of whorled Fl.* p. 284.

E. *Petals* 2.

538. **FONTANESIA.** Cal. 4-parted, inferior. Pet. bipartite. Caps. with 2 cells and 2 seeds, not opening. *Habit of* Phillyrea. *Fr. approaches that of* Fraxinus. JASMINEÆ. p. 244.

230. **CIRCÆA.** Cal. 2-leaved, superior. Pet. cloven. Caps. with 2 cells and 2 seeds. *L. opposite, undivided. Fr. covered with hooked prickles.* ONAGRARIÆ. p. 126.

F. *Petals* 0.

236. **SUFFRENIA.** Cal. 4-cleft, with 4 small, intermediate teeth. Cor. 0. Caps. 2-celled, many-seeded. LYTHRARIÆ. p. 127.

757. **LEMNA.** Cal. a skinny, lacerate sheath. Cor. 0. Caps. with 1 seed. *Plant a simple or proliferous floating frond. Fl. from a cleft in the margin.* LEMNACEÆ. p. 349.

827. **CLADIUM.** Glumes skinny, sheathing; the outer ones empty. Drupe without bristles. *Polished, rush-like Stems, with harsh, cutting L.* CYPERACEÆ. p. 381.

Salicornia. Rhyncospora alba. Lepidium ruderale.

II. DIGYNIA. GRAMINA.

865. **COLEANTHUS.** Fl. naked. Upper Pale awned; lower cloven, pointless, with 2 rough nerves. p. 400.

852. **ANTHOXANTHUM.** Glumes 2, containing 1 perfect Fl. of 2 minute, awnless pales, and 2 larger outer valves, each of which is awned, being the rudiments of 2 barren Flts. *A sweet-smelling Grass. Pan. spike-like, one-sided at base.* p. 397.

Hierochloe. Crypsis aculeata.

III. TRIANDRIA.

I. MONOGYNIA.

A. *Cal. superior. Segm. of Cor. fewer than* 6. *Cells of Fr.* 1–3. *Seeds solitary, dicotyledonous.* VALERIANEÆ.

375. **VALERIANA.** Cor. 5-cleft, unequal at base. Cal. expanding into a feathery crest to the single seed. *Perennial plants. Stems round. L. smooth, opposite. Fl. terminal.* p. 169.

373. **FEDIA.** Cor. 5-cleft, gibbous at base. Caps. 1–3-celled, crowned with the erect teeth of the calyx. *Annuals. Stem dichotomous. L. opposite.* p. 168.

B. *Cal. superior, 3-cleft. Cor.* 0. *Fr. a dry, one-seeded drupe.* SANTALACEÆ.

706. **OSYRIS.** Sta. very short. Stigmas 3. Fl. somewhat polygamous. *Shrubby, with slender, rod-like branches.* p. 323.

C. *Cal.* 0. *Cor. superior, with* 6 *segments. Cells of Fr.* 3, *many-seeded. Seeds monocotyledonous.* IRIDEÆ.

775. **CROCUS.** Cor. regular. Segm. close together. Tube longer than the border. Stigmas 3, dilated upwards, plaited or lobed. *Stalk none. Bulb coated externally, the new one placed on the old. L. long, narrow.* p. 357.

776. **ROMULEA.** Cor. regular, open. Tube shorter than the border. Fil. downy. Stigmas 3, bipartite. Segm. linear. *Fl. stalked. Bulb coated.* p. 357.

777. **GLADIOLUS.** Cor. tubular, 2-lipped. Segm. undulate, unequal. Stigma trifid. Seeds with an arillus. *Root a coated bulb. L. ensiform, sheathing.* p. 358.

778. **IRIS.** Segm. of Cor. unequal, alternately reflexed. Stigmas 3, petal-like, covering the stamens, 2-lipped; the lower lip very small. *L. mostly ensiform, equitant. Root fleshy, creeping, perennial.* p. 358.

D. *Fl. inferior, not glumaceous.*

161. **CNEORUM.** Cal. 3–4-toothed. Pet. 3–4, equal. Sta. 3–4. Drupe with 3–4 knobs. *Shrubby. L. alternate, without stipules.* TEREBINTHACEÆ. TRICOCCÆ of Linn. p. 75.

115. **ORTEGIA.** Cal. of 5 L. Cor. 0. Caps. 3-valved at the summit, with 1 cell and many seeds. *Herbaceous. L. opposite, with very small stipules.* CARYOPHYLLACEÆ. p. 53.

255. **LŒFLINGIA.** Cal. 5-parted: Div. with 2 teeth at base. Pet. 5, small, connivent. Caps. with 3 valves, 1 cell, and many seeds. PARONYCHIEÆ. p. 131.

690. **POLYCNEMUM.** Bracts 2–3. Cal. deeply 5-parted. Cor. 0. Sta. 2–5. Style

cloven. Seed 1. CHENOPODIEÆ. *Herbaceous. Fl. small, sessile, axillary. L. subulate,* somewhat 3-edged. p. 314.

Atriplex. Amaranthus.

754. **CAULINIA.** Cal. 0. Cor. 0. Fil. dilated, persistent, bearing the Anthers at the base externally. Fr. a 1-seeded berry. POTAMEÆ. p. 348.

E. *Fl. inferior, glumaceous, of a single scale; covering, not in itself including, the organs. Seed* 1. *Plants grass-like, but not exhibiting knots on the stem.* CYPERACEÆ.

825. **CYPERUS.** Spikelets many-flowered. Scales in 2 rows, alike, not crowded, nearly all fertile. *Seeds without bristles.* p. 379.

826. **SCHŒNUS.** Spikelets 1–3-flowered. Scales in 2 rows, crowded; outer smaller and empty. Style without joinings, deciduous. p. 380.

828. **RHYNCHOSPORA.** Spikelets few-flowered. Scales tiled all round; outer smaller and empty. Style bifid, with an expanded, persistent base. Seed with bristles at base. p. 381.

830. **SCIRPUS.** Scales tiled all round, alike, or the lowest rather larger, nearly all fertile. Germen tipped with the filiform base of style. p. 381.

831. **FIMBRISTYLIS.** Scales tiled all round; lower larger, 1 or 2 of them barren. Style compressed, ciliate; base enlarged, with a joining to the ovary. p. 383.

829. **BLYSMUS.** Spikelets in 2 rows. Scales tiled; outer larger and empty. Style persistent, not enlarged at base. p. 381.

832. **POGONOSTYLIS.** Scales tiled all round. Style enlarged and jointed at base, fringed. Base of Style furnished with a long beard. p. 383.

833. **ERIOPHORUM.** Scales tiled all round. Style simple, deciduous. Seed surrounded with long, silky hairs. p. 383.

F. *Fl. of Glumes or Pales enveloping the organs. Seed* 1, *naked, superior. Stem jointed, with a sheathing L. at each joint.* GRAMINA.

855. **LYGEUM.** Flts. 2–3, in a convolute sheath. Glumes 0. Base of the Pales hardening into a 2-celled seed-vessel. p. 398.

913. **NARDUS.** Glume 0. Pales 2, terminating in a bristle, rigid, slender. Fl. in a simple, unilateral, 2-rowed spike. p. 420.

912. **ECHINARIA.** Spikelets sessile, in a head tiled all round. Flts. 1 or 2, the second generally barren. Outer Pale herbaceo-coriaceous, ending in several long, rigid setas. *Head with a laciniate involucrum.* p. 420.

II. DIGYNIA. GRAMINA (*see above*).

A. Monandrous. *Psilurus.*

B. Diandrous. *Coleanthus. Anthoxanthum.*

C. In Triandria Monogynia. *Nardus. Lygeum. Echinaria.*

D. In Triandria Digynia.

i. Spikelets in opposite rows, on an alternately channeled rachis.

a. Spikelets of 2 or more Flts., all, or nearly all, perfect.

b. Spikelets all fertile, but with only 1 perfect Flt.

c. Spikelets in threes, the lateral usually barren; none with more than one perfect Flt.

ii. Spikelets not on such a rachis, one-flowered, with additional scales!

a. Spikelets in twos, sessile and stalked; the latter barren.

b. Spikelets in sets, sessile and stalked; all fertile, placed in two rows on one side of a flattened rachis.

c. Spikelets all fertile, in a compound spike, tiled all round, and furnished with a bristle-like involucrum.

d. Spikelets in sets, all fertile, one sessile, and one or two stalked; enveloped in long silky hairs!

e. Spikelets all fertile, scattered, not enveloped in hairs, or surrounded by an involucrum.

iii. Spikelets one- or more flowered, without additional exterior scales (which are likewise wanting in the following sections), placed in two rows on one side of a flattened rachis.

iv. Spikelets sessile, two- or more flowered, in a head or spike, tiled all round.

v. Spikelets scattered, one- or more flowered. Flts. enveloped in silky hairs.

vi. Spikelets scattered, one-flowered, without glumes!

vii. Spikelets scattered, in a spike-like panicle or head. Glumes one-flowered.

viii. Spikelets scattered, in a loose panicle. Glumes one-flowered.

ix. Spikelets scattered, in a loose panicle, with a second imperfect Flt.

x. Spikelets scattered, with more than one perfect Flt.

a. Glume nearly, or quite, equalling spikelet.

b. Glume decidedly shorter than spikelet.

E. In Hexandria Digynia. *Oryza.*

F. In Monœcia Triandria. *Coix. Zea.* The former is said to be naturalized near Palermo, and the latter is extensively cultivated in s. Europe.

i. *Spikelets in opposite rows, on an alternately channeled rachis.*

a. *Spikelets with two or more flowers, all perfect.*

906. **LOLIUM.** Spikelets placed edgewise on the rachis! Lower Glume very obscure or wanting. p. 417.

905. **BRACHYPODIUM.** Glumes unequal, ribbed, much smaller than the outer pale. Spikelets on short stalks, *more widely separated than is usual in* Triticum. p. 417.

907. **TRITICUM.** Glumes nearly equal, opposite, broad, embracing the solitary spikelet. Pale terminating rather abruptly, and generally with a point or seta. p. 418.

908. **SECALE.** Glumes narrow. Spikelets solitary. Pale gradually tapering into a long seta. Seed crested. p. 419.

909. **ÆGILOPS.** Glumes placed rather obliquely; these and the outer pale herbaceo-coriaceous, turgid, terminating in several stout setas. p. 419.

910. **ELYMUS.** Spikelets 2 or 3 together. Glumes on one side. p. 419.

885. **GAUDINIA.** Glumes unequal, much shorter than spikelet. Outer Pale with a geniculate and twisted dorsal awn. Rachis brittle. p. 406.

b. *Spikelets all fertile, with only one perfect Flt., placed edgewise to the rachis, and when closed imbedded in it, so as to form a continuous cylinder or prism.*

915. **LEPTURUS.** Glumes 1 or 2 on the same side of the unarmed spikelet, which contains one perfect Flt. and an interior rudiment. p. 420.

c. *Spikelets in threes: the lateral usually barren, stalked; none with more than one perfect Flt.*

911. **HORDEUM.** Glumes setaceo-aristate, both on one side of the spikelet. A superior Rudiment in each Spikelet towards the rachis. p. 420.

Elymus europæus. Sclerochloa Triticum and divaricata.

ii. *Spikelets one-flowered, with additional scales; the rudiments of one or more exterior Flts.*

[In *Andropogon, Saccharum, Erianthus,* and *Imperata,* from the delicacy of the parts, it is

often very difficult to distinguish the additional rudiment, but these may be known from all other European Grasses not included in the preceding section by the spikelets in twos or threes, and one of them sessile.]

a. *Spikelets in twos, sessile and stalked; the latter barren.*

841. **SORGHUM.** Spikelets oblong or rather ovoid. Glumes of fertile Fl. coriaceous, without striæ. Seed large, roundish. p. 395.

840. **ANDROPOGON.** Spikelets lineari-lanceolate. Seed nearly linear. *In the European species of this genus, except in* A. Gryllus *and* A. Allionii, *the Fl. are in fingered spikes.* p. 395.

b. *Spikelets all fertile, sessile and stalked, in two rows, on one side of a flattened rachis.*

842. **DIGITARIA.** Spikes fingered. Spikelets unarmed. Seed invested with the hardened pales. p. 396.

844. **OPLISMENUS.** Spikes in racemes or panicles. Spikelets naked. Glumes keeled, plaited, or setigerous. p. 396.

c. *Spikelets all fertile, in a compound spike, tiled all round, with a bristle-like involucrum.*

845. **SETARIA.** Spikelets accompanied by setiform bracts. p. 396.

846. **PENNISETUM.** Spikelets accompanied by bracts, some of which are feathery. p. 397.

d. *Spikelets all fertile, disposed in sets, one sessile and one or two stalked, enveloped in long silky hairs.*

837. **SACCHARUM.** Awnless. Squamules 2. Pales without hairs; inner minute or wanting. Pan. not spike-like. p. 395.

839. **ERIANTHUS.** Lower Pale of fertile Flt. awned. Squamules 2. Sta. 2–3. Pan. spreading. p. 395.

838. **IMPERATA.** Awnless. Squamule 0. Pan. spike-like. p. 395.

e. *Spikelets all fertile, scattered, not enveloped in hairs.*

851. **PHALARIS.** Additional Scales short, unarmed. Glumes boat-like, keeled, inclosing Pales, coriaceous, hardening on seed. p. 397.

850. **EHRHARTA.** Glumes membranous, unarmed, not inclosing the pales. Barren Flts. 2, coriaceous, transversely wrinkled, inclosing papery pales. p. 397.

843. **PANICUM.** Barren Flt. 1, large, glume-like, embracing the horny, ribless pale. Glumes not inclosing. p. 396.

iii. *Spikelets one- or more flowered, without additional external scales, sessile or nearly so, in two rows on one side of a flattened rachis.*

[In this and all the following divisions, all the spikelets are perfect, except in *Lappago*, where the uppermost of each short spike are barren or neuter, and in *Cynosurus*, where the barren spikelets form a sort of involucrum.]

875. **CYNODON.** Spikelets 1-flowered, with an interior rudiment. Spikes fingered. Glumes unequal, membranous. Pales membranous; outer broad, embracing the inner. Seed invested with the hardened pales. p. 402.

876. **DACTYLOCTENIUM.** Spikelets 2- or more flowered. Spikes fingered. Inner Glume mucronate. Pales unequal: the outer ventricose, membranous; inner scariose. p. 402.

878. **LEPTOCHLOA.** Spikelets 2- or more flowered. Spikes in a raceme. Glumes keeled. Outer Pale keeled, 3-nerved. Awn straight. p. 402.

877. **BECKMANNIA.** Spikes in a raceme. Spikelets unarmed, 1–2-flowered. Glumes

equal, deeply boat-shaped, enlarging towards the apex, very obtuse. Pales 2, included; the outer beaked. Seed loose. p. 402.

879. **SPARTINA.** Spikes compound. Spikelets 1-flowered. Glumes very unequal; the inner acuminate. Styles united for half their length. Nect. 0. p. 402.

895. **OREOCHLOA.** Spikelets many-flowered, in a simple spike or head. Glumes and outer Pale concave, membranous, with a scariose margin. p. 408.

Knappia minima. Triticum Nardus and unilaterale. Festuca maritima and divaricata. Sclerochloa loliacea.

iv. *Spikelets sessile, two- or more flowered, in a head or spike, tiled all round.*

894. **SESLERIA.** Outer Pale membrano-scariose, ending in 3–5 soft, flexible teeth. Stigmas long. Styles united below. p. 408.

v. *Spikelets scattered, one- or more flowered. The Flts. enveloped in long silky hairs.*

871. **ARUNDO.** Glumes membranous, equal, or the outer largest. Pales membranous. Awn, if any, fine and slender. Pan. spreading. p. 401.

872. **AMMOPHILA.** Spikelets 1-flowered, with an interior rudiment. Glumes nearly equal, membrano-scariose. Outer Pale membranous, with a short, strong point below the apex. p. 402.

873. **PHRAGMITES.** Spikelets many-flowered; the lowermost imperfect and not enveloped in hairs. Glumes membranous; the outer much the smallest. Pales scariose, unarmed. p. 402.

874. **AMPELODESMOS.** Spikelets many-flowered; the lowermost perfect, unless where the Glume is changed into an imperfect Flt. Outer Glume rather the smallest. Pale with a subapicular awn. Seed crested! Pan. diffuse. p. 402.

vi. *Spikelets scattered, one-flowered, without glumes.*

848. **LEERSIA.** Pales ribbed, herbaceo-membranous, of equal length, nearly valvular; outer boat-shaped, unarmed. *Pan. lax.* p. 397.

vii. *Spikelets scattered, one-flowered, in a spike-like panicle or head.*

856. **ACHNODONTON.** Spikelets spindle-shaped. Glumes equal, boat-like, unarmed, including. Outer Pale unarmed, embracing the inner of equal length. p. 398.

857. **PHLEUM.** Spikelets oblong. Glumes nearly equal, setigerous, parallel on the keel, including 2 unarmed pales. p. 398.

858. **ALOPECURUS.** Glumes equal, unarmed, *usually united at base!* Pale 1, shorter than glume; *the margins in some species united below!* Awn dorsal. p. 398.

859. **CRYPSIS.** Head or Spike included in most species in a common involucrum. Glumes membranous, unarmed. Pales 2, entire, membranous, unarmed, as long as glumes. *C. aculeata* has only 2 stamens; *C. alopecuroides* a naked spike. p. 399.

860. **GASTRIDIUM.** Glumes ventricose at base, including pales, scariose. p. 399.

882. **LAGURUS.** Glumes scariose, ending in a long, fringed seta. Outer Pale quite smooth, ending in 2 setas and an intermediate, geniculate and twisted, dorsal awn. p. 404.

847. **LAPPAGO.** Outer Glume scariose; inner coriaceous and prickly. p. 397.

Polypogon monspeliensis and maritimus.

viii. *Spikelets one-flowered, scattered in a loose panicle.*

864. **VILFA.** Glumes membranous, unequal, not exceeding pale. Pale membranous, unarmed. p. 400.

863. **AGROSTIS.** Glumes membranous, including. Pales unequal, smooth, not hardening on the seed. Awn, if any, slender, dorsal. p. 399.

866. **KNAPPIA.** Pale scariose, shaggy, truncate; the inner minute or wanting. Spikelets in a raceme, obscurely 2-rowed. Rachis cylindrical. *Seed loose, with longitudinal dotted lines.* p. 401.

861. **POLYPOGON.** Glumes emarginate, each furnished with a long, slender seta, scariose, including pales. Pales scariose; the outer with a dorsal awn. p. 399.

862. **MILIUM.** Glumes herbaceo-scariose. Pales membrano-coriaceous, nearly equal, unarmed, hardening on the seed. p. 399.

867. **PIPTATHERUM.** Glumes membranous. Flts. sessile. Pales subcoriaceous, joined to a straight, terminal awn, hardening on the seed. p. 401.

869. **ARISTIDA.** Glumes unequal, membranous, very narrow. Outer Pale coriaceous, involute, with 3 awns; *inner wanting in the Sicilian species.* Pales including the free seed. p. 401.

868. **STIPA.** Glumes scariose, herbaceous at base. Flts. stalked. Pales coriaceous, hardening on the seed. *A geniculate and twisted* Awn joined at or near to its extremity. p. 401.

870. **ACHNATHERUM.** Glumes scariose, herbaceous at base. Pale membranous. Awn geniculate and twisted, with a distinct, though slightly marked joining on to the outer pale, at which it readily breaks off. p. 401.

ix. *Spikelets in a loose panicle, with a second imperfect Flt.*

887. **HOLCUS.** Lower Flt. perfect, unarmed; upper awned, generally barren. p. 406.

886. **ARRHENATHERUM.** Lower Flt. barren, with a geniculate awn; upper perfect, with a short straight awn. p. 406.

853. **HIEROCHLOA.** Two outer Flts. barren, triandrous; middle perfect, diandrous, all unarmed. p. 397.

Melica uniflora.

x. *Spikelets scattered, with more than one perfect Flt.*

[Among these genera, *Aira*, *Deschampsia*, *Danthonia*, and *Avena*, are mostly awned, the awn easily breaking away from the Pale; and these are never furnished with a seta forming a mere continuation of the midrib. In *Trisetum* and *Kœleria* it is difficult to decide whether we find an awn or a seta. *Dactylis*, *Bromus*, and *Cynosurus* are setigerous; *Festuca* often so; and we sometimes find a small mucro on the outer pale of *Sesleria*. The other genera are unarmed.]

a. *Glumes nearly or quite as long as the spikelet.*

880. **AIRA.** Glumes 2-flowered, without rudiment. Awn, if any, dorsal, geniculate and twisted. *The Pales in some species harden on the seed, but without adhering to it. Pan. equal, shining.* p. 403.

881. **DESCHAMPSIA.** Glumes 2-flowered, with usually, the not club-like rudiment of a third. Outer Pale truncate, with a straight Awn from near the base, surrounded by soft hairs. p. 403.

891. **MELICA.** Glumes nearly equal, larger than pales; 1- or 2-flowered, with the stalked, club-like rudiment of 1 or 2 more. Pales unarmed, membranous, hardening on the seed. p. 407.

888. **DANTHONIA.** Glumes 2- or more flowered. Outer Pale smooth and coriaceous below, membranous and nerved above, emarginate, with an intermediate, broad tooth, *which sometimes terminates in a geniculate and twisted awn.* p. 406.

890. **SCHISMUS.** Glumes many-flowered, much larger than pales, membranous, ribbed, with a scariose margin. Outer Pale similar, rounded at the end, except for a terminal notch. *P. de B. mentions a terminal seta.* p. 407.

889. **KŒLERIA.** Glumes and outer Pale herbaceo-scariose; the latter entire, acuminate, or with a terminal or subterminal, not geniculate seta. Spikelets ovate. Pan. often spike-like, somewhat one-sided. Seed loose. p. 407.

883. **TRISETUM.** Glumes and outer Pale keeled, membrano-scariose, without prominent nerves; the latter ending in 2 teeth, and with a slender dorsal awn, which in most species is geniculate. Seed without furrow or crest. p. 404.

884. **AVENA.** Glumes herbaceous or membranous, with a scariose margin. Outer Pale firmer than glume, ribbed, ending in 2 points, with an intermediate geniculate and twisted dorsal awn. Seed furrowed and crested. p. 404.

b. *Glumes decidedly falling short of the spikelet.*

896. **POA.** Glumes nearly equal. Outer Pale compressed, keeled, membranous, with a scariose margin, entire, rather acute, unarmed. *Pan. one-sided in* nemoralis, compressa, *and* annua; *equal in the others. In* P. divaricata *the glumes are very unequal.* p. 408.

897. **ERAGROSTIS.** Glumes and outer Pale similar, membrano-scariose throughout, with 3, prominent, converging nerves. p. 410.

898. **GLYCERIA.** Glumes and outer Pale membrano-herbaceous, with sharply prominent nerves, and a scariose margin. p. 411.

899. **SCLEROCHLOA.** Glumes and outer Pale membranous, with rounded, often obscure ribs, which disappear towards the base. Flts. cylindrical at base, *keeled in some species at top,* unarmed, or with a minute and hardly distinguishable mucro. p. 411.

893. **CATABROSA.** Glumes and outer Pale membranous at base, both eroso-truncate; the latter with 3 ribs ending in as many teeth, which are united by the scariose margin. p. 408.

900. **BRIZA.** Glumes nearly equal, broad, boat-shaped, obtuse. Outer Pale boat-like, heart-shaped, ventricose, keelless, unarmed, *adhering to seed.* p. 412.

892. **MOLINIA.** Glumes 2–3-flowered, with a subulate rudiment. Pales acute, both entire, membranous, firmer than glume, and hardening on the seed. p. 408.

901. **CYNOSURUS.** Spikelets attached to a neutral spicule or spike. Fertile Spikelets 1- or more flowered. Glumes scariose, keeled. Outer Pale concave, keeled, with a terminal seta. *Pan. one-sided.* p. 412.

902. **DACTYLIS.** Glumes unequal, many-flowered, acute, herbaceous, with a terminal seta, compressed, and keeled. *Spikelets crowded. Pan. one-sided.* p. 412.

903. **FESTUCA.** Glumes unequal, many-flowered, thinner than the pale. Pale ribbed, rounded on the back; very acute, or with a terminal, or very nearly terminal, seta. *Pan. one-sided, except in* F. gigantea. p. 412.

904. **BROMUS.** Glumes unequal, many-flowered. Outer Pale ribbed, with a dorsal seta. Inner with 2 ciliate ribs. *Pan. equal.* p. 415.

I have given in the order GRAMINA a different and more natural arrangement of the genera, hoping that the student who experienced difficulties in the one, might find his account in the other.

III. TRIGYNIA.

247. **MONTIA.** Cal. of 2 L. Cor. of 1 petal. Caps. 1-celled, 3-valved, 3-seeded. (Sta. 3–5. Style 1.—DC.) *L. opposite, somewhat succulent.* PORTULACACEÆ. p. 129.

122. **HOLOSTEUM.** Cal. 5-leaved. Pet. 5, jagged. Fil. thread-like. Caps. 1-celled, splitting at top into 6 teeth, many-seeded. *L. opposite, quite entire. Has the habit of* Cerastium. CARYOPHYLLACEÆ. p. 56.

253. **POLYCARPON.** Cal. 5-leaved, concave, keeled. Pet. 5, nearly entire. Fil. subulate. Caps. 3-valved, 1-celled, many-seeded. L. opposite or in fours. (*Styles* 2, *very short.* —DC.) *Two of the three European species are pentandrous.* PARONYCHIEÆ. p. 131.

Tillæa. Eriocaulon.

IV. TETRANDRIA.

I. MONOGYNIA.

A. *Fl. of* 1 *petal, inferior. Seed* 1. GLOBULARIEÆ.

675. **GLOBULARIA.** Involucre tiled. Calyx tubular. Stamens inserted in tube of corolla. *Flowers in a head, blue.* p. 303.

B. *Fl. of* 1 *petal, superior. Seed* 1. *Calyx double. Flowers in a head.* (The covering of the Seed is sometimes considered as an inferior calyx. Its border forms what is here called the outer Calyx.) DIPSACEÆ. AGGREGATÆ of Linn.

376. **DIPSACUS.** Involucre of many L.: the outer exceeding the inner. Receptacle chaffy. Outer Calyx a thickened margin; inner a cup without awns or setas. *Plant rough. Leaves opposite, often combined. Chaff* long and somewhat pungent. p. 170.

377. **CEPHALARIA.** Involucre tiled; the outer falling short of the inner. Receptacle chaffy. Outer Calyx with bristle-like teeth. Inner a denticulate cup. *Chaff soft and blunt.* p. 170.

378. **KNAUTIA.** Involucre of many L. Receptacle hirsute, not chaffy. Outer Calyx with sharp teeth; inner with 8–16 subulato-setaceous teeth. p. 171.

380. **SCABIOSA.** Involucre of many L. Receptacle chaffy. Outer Calyx with 8 depressions, and a scariose, plaited margin; inner of 5 rough, simple setas. *In* S. pauciseta *these setas are more or less deficient.* p. 171.

379. **PTEROCEPHALUS.** Involucre of 2 rows. Receptacle chaffy. Outer Calyx with 8 pits and a short, scariose margin; inner of about 10 feathery setas. p. 171.

C. *Fl. of* 1 *petal, superior. Seeds* 2, *separate. Leaves simple, in whorls,* (*except in* Putoria.)

372. **RUBIA.** Corolla campanulate. Fruit of 2 roundish berries, not crowned. p. 168.

370. **VALANTIA.** Corolla campanulate. Fl. in threes; the central perfect, 4-cleft; lateral barren, 3-cleft. Calyces at length united at the base, and becoming horny. p. 167.

369. **GALIUM.** Corolla rotate. Fruit dry, not crowned. p. 164.

368. **ASPERULA.** Corolla tubular. Fruit dry, not crowned. p. 163.

366. **PUTORIA.** Corolla funnel-shaped. Berry dicoccous, crowned with the calyx. *Woody. Leaves opposite. Flowers in terminal clusters.* p. 163.

367. **SHERARDIA.** Corolla funnel-shaped. Fruit dry, crowned with the calyx. *Flowers terminal. Habit of* Galium. p. 163.

371. **CRUCIANELLA.** Tube of Corolla filiform, with claw to the border. Calyx of 2 Leaves. Seeds linear. p. 167.

D. *Fl. of one petal, inferior. Seeds more than one, in a simple seed-vessel.*

789. **MAIANTHEMUM.** Calyx 0. Corolla 4-partite, rotate. Fruit a berry of 2 or 3 cells and as many seeds. ASPARAGEÆ. p. 363.

555. **CICENDIA.** Corolla funnel-shaped. Caps. imperfectly 2-celled, splitting at the top. Seeds many, immersed in the placentas. Anthers not twisting. Stigma cloven. *Smooth, bitter Herbs, with simple, entire, opposite Leaves.* GENTIANEÆ. p. 249.

664. **CENTUNCULUS.** Corolla tubular, including the smooth stamens. Caps. globose, 1-celled, circumsciss. *A minute plant, with alternate Leaves and inconspicuous Fl.* PRIMULACEÆ. p. 299.

680. **PLANTAGO.** Corolla bent back. Stamens very long. Caps. 2–4-celled, circumsciss. *Flowers in spikes, each with a bract.* PLANTAGINEÆ. p. 309.

Gentiana 4.