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The Student's Flora of the British Islands

This textbook was originally published in 1870, but is here reissued in the third edition of 1884. Its object was 'to supply students and field-botanists with a fuller account of the Flowering Plants and Vascular Cryptograms of the British Islands than the manuals hitherto in use aim at giving'. Sir Joseph Dalton Hooker (1817–1911), one of the most eminent botanists of the later nineteenth century, was educated at Glasgow, and developed his studies of plant life through expeditions all over the world. (Several of his other works are also reissued in the Cambridge Library Collection.) A close friend and supporter of Charles Darwin, he was appointed to succeed his father as Director of the Botanical Gardens at Kew in 1865. The flora is followed in this reissue by an 1879 catalogue of British plants compiled by the botanist George Henslow (1835–1925), intended as a companion volume.

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The Student's Flora of the British Islands

JOSEPH DALTON HOOKER

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THE STUDENT'S FLORA

OF THE

BRITISH ISLANDS.

THE STUDENT'S FLORA

OF THE

British Islands

BY

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DIRECTOR OF THE ROYAL GARDENS, KEW.

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PREFACE.

THE object of this work is to supply students and field-botanists with a fuller account of the Flowering Plants and Vascular Cryptogams of the British Islands than the manuals hitherto in use aim at giving.

For the plants regarded as composing the British Flora proper, I have mainly followed the *London Catalogue of British Plants*, 7th ed., 1874; being fully satisfied that I should thus best serve the interests of British Botany. The difficult task of determining which of the many doubtfully indigenous or naturalized plants should be regarded as British by adoption or otherwise has in the successive editions of this Catalogue been settled by the two botanists most competent to form an opinion by many years of research and by matured judgment—Messrs. H. C. Watson and J. Boswell. It is true, I may think that some of the Species they have introduced have less claims than some they have rejected, but this applies to very few cases indeed.

The Ordinal, Generic, and Specific characters are to a great extent original, and drawn from living or dried specimens or both. After working them out, I have consulted the usual British and Continental Floras, and collated the descriptions throughout with Mr. Boswell's (an author usually quoted by his earlier name of Syme) edition of *English Botany*, of the descriptions in which work I cannot speak in terms of too high praise. By this method of re-description, whilst I believe I have avoided some errors of my predecessors, I have no doubt made others of my own; such creep into all endeavours to describe most or all of the organs of

many Species: and if I have made many such blunders, a part may be attributable to the fact that various Genera were described amidst constant interruptions, and all under pressure of official duties.

The terminology employed is as simple as is attainable with a due regard to precision of language. In the choice of terms I have followed Oliver's *Lessons in Elementary Botany;* usually avoiding such as are used in single Orders only, or are of special signification in single Orders or Genera. For modifications of the fruit the choice of terms presents great difficulty; and I have therefore very much confined myself to such as are required to avoid periphrasis, as capsule, drupe, berry, utricle, follicle, pod, &c. (about which there is no ambiguity), and to *achene* for the dry indehiscent 1-seeded carpels of apocarpous fruits. For Grasses, Compositæ, &c., the term *fruit* is itself sufficiently explicit, its nature being explained in the Ordinal description. The term *nutlet* for the parts of the fruit of *Boragineæ* and *Labiatæ* I have borrowed from Asa Gray.

The Keys to the Genera are naturally arranged, but in *Umbelliferæ* I have added an artificial key, as being useful for the determination of a Genus before the whole Order has been studied. I have given no keys to the Species, preferring curt diagnoses which embrace the more important characters of the plant; finding, moreover, from experience, that such keys promote very superficial habits among students.

For the areas and elevations inhabited by the plants of the British Isles I am mainly indebted to Mr. Watson's admirable works. The areas occupied more or less continuously by the Species are here defined by the counties, which thus indicate their limits. Where the words "northwards" and "southwards" are used it implies that the plant ranges to Shetland in the former case, and to both Cornwall and Kent in the latter. In this Edition I have in all cases mentioned Ireland when the Species inhabits that country; and when rare or local in Ireland, its limits are taken from the *Cybele Hibernica* of More and Moore, a standard work. I have in like manner definitely mentioned the Channel Islands. I have been urged by very competent botanists to include the Faroe Islands, as really more British geographically than are the Channel Islands; but, if I did so, Iceland should also be included, and on the whole I have thought it

best to retain the old limits of the British Flora. The extra-British distributions I worked out myself for most of the British plants, making large use of Nyman's *Sylloge* (ed. 2).

Of the altitudes, I have chosen the highest the species attains, and indicated the region where this is attained; when no elevation is given, the Species is not known to ascend to 1,000 feet, and may be assumed to be a "low-ground" plant. To the doubtfully indigenous Species I have often added Watson's opinion as to whether they are "aliens," "colonists," or "denizens," &c. It may be well to repeat here his definitions of these terms, premising that by "native" is meant that the Species has not been introduced by human agency :—*

"A denizen is a Species suspected to have been introduced by man, and which maintains its habitat. A colonist is one found only in ground adapted by man for its growth and continuous maintenance. An alien has presumably been introduced by human agency."

The estimates of the numbers of Genera in the Orders, and of Species in the Genera, are taken from the *Genera Plantarum;* they serve to indicate to the student the relative extent of these groups. The indications of their affinities and properties are necessarily extremely brief. The etymologies of the generic names I have endeavoured to reduce to really useful limits. Only such English names as are pretty well known are given, and for these I have in many cases been guided by Dr. Alexander Prior's *Popular Names of British Plants*, a very good book.

In the First and Second Editions I recorded my obligations to Professor Oliver, Mr. Baker, Professor Dickson, Mr. G. Griffiths, and the Rev. E. J. Linton, for valuable observations and suggestions; to Mr. Baker especially for aid in classifying the critical forms of *Rubus*, *Rosa*, and *Hieracium*.

In this, the Third Edition, I have introduced many improvements in the classification and characters of the Orders, Genera, and Tribes, adopted in

* The vagueness of these definitions is unavoidable; and their correct application in many cases is exceedingly difficult. Few who have not gone into the subject have an idea of how many plants would disappear from our Flora were the soil left undisturbed by man and the lower animals which he rears. I think it probable that both the Shepherd's-Purse and the common form of the Dandelion would be amongst the first to be suppressed.

Bentham's and my *Genera Plantarum*. I have also made changes in the limits of the Species of certain Genera, and of their subordinate forms, in which matter I have often had regard to suggestions and materials laid before me by Mr. Baker (who has again revised the sheets as they passed through the press), and Mr. Nicholson; and for the first forty-one Orders to notes made for me by Mr. Ball, F.R.S. These last have a special value, due to Mr. Ball's critical knowledge of so many European Floras, and his excellent judgment. I have further profited by the last edition (8th) of Professor Babington's accurate and critical Manual, and have collated the whole with the second edition of Nyman's *Sylloge Floræ Europææ*, and of Newbould's and Baker's edition of Watson's *Cybele*. To Mr. Arthur Bennett, F.L.S., of Croydon, I am indebted for revising the Genus *Potamogeton*, and for notes upon *Carices*.

The collation of the British Flora with Nyman's *Sylloge* has not been satisfactory throughout, because of the wide divergence of the views there upheld regarding the Species of such Genera as *Rubus*, *Rosa*, &c., from those held by English botanists. This is doubtless due to the fact that characters which are constant and strong in one country become vague and even evanescent in others; insomuch that I am led from examination and study to believe that, in respect of the subdivision of the European forms of such Genera into Species, Sub-species, and Varieties, the materials in Britain may give one result, those in France another, in Scandinavia a third, and in Germany a fourth.

I am disposed to think that the term Sub-species (which represents a stage of evolution between Species and Variety) should be given to many forms considered by some as Species and as Varieties by others; and that this would facilitate the better understanding especially of the larger critical Genera. The various forms of fruticose *Rubi*, for example, whether all treated as Species, or all as Varieties, present to me a mere chaos; whereas, when treated as Sub-species and Varieties, however imperfectly, they fall into comprehensible groups, whose cross affinities may thus be more clearly enunciated.

Lastly, I have ventured to introduce into this Edition, under the description of the flowers of various Genera, characters concerned in the process

of fertilization,—as, whether wind-fertilized (anemophilous), insect-fertilized (entomophilous), or self-fertilized; also whether honey is secreted in the flower; and whether the stamens and stigma ripen together (homogamous), or the anthers first (proterandrous), or the stigma first (proterogynous). For most of the information under these heads I am indebted especially to the observations of Hermann Müller, supplemented by those of Sir John Lubbock and Mr. Alfred Bennett. Our knowledge of these subjects is incomplete and rudimentary: any student may add to it; but great caution is required, for I suspect that individual Species are subject to considerable variation in these respects.

ROYAL GARDENS, KEW,
June 1, 1884.

SYNOPSIS OF THE NATURAL ORDERS

(ADAPTED TO THE BRITISH GENERA).

THE arrangement of Dicotyledons here adopted adheres very closely to the Jussieuan as modified by De Candolle, which, notwithstanding its many defects (inseparable from a linear arrangement), is, I think, as good as any of those subsequently proposed,* and has the great advantage of being that most generally adopted in the Universities and Schools of Great Britain and America, and in systematic works everywhere. Its great defect is the necessity of an Apetalous division, embracing a heterogeneous mass of Orders, which are incapable of being naturally grouped. Some of these are obviously allied to Polypetalous or Monopetalous Orders, but cannot be placed in contiguity with them without interfering with their other and closer alliances; some again present cross affinities with two or more distant Orders; and the greater proportion have no recognized near affinities. Under these circumstances, and seeing how much the retention of the Apetalous division facilitates the often difficult task of finding the Natural Order of a plant, it appears to be premature to depart from the Jussieuan system.

SUB-KINGDOM I. **Phænogamous** or **Flowering** plants. Plants provided with stamens, and ovules which after fertilization become seeds containing an embryo.

CLASS I. **Dicotyledonous** or **Exogenous** plants. *Stem* with bark, pith, and interposed wood; when perennial increasing in diameter annually by a layer of wood added to the outside of the old wood, and another of bark added to the inside of the old bark. *Leaves* with usually netted

* Of these the principal are: that of Bronguiart, adopted in the Paris Schools; of Endlicher, in many of the German Schools; of Fries, by various botanists in Scandinavia; and of Lindley ("The Vegetable Kingdom"), which has been partially followed in England and India alone.

veins. *Flowers* with the organs mostly in fours or fives. *Embryo* with opposite or whorled cotyledons.

SUB-CLASS I. **Angiospermous Dicotyledons.** *Flowers* usually provided with a distinct perianth. *Ovules* contained in closed carpels, through the tissues of which the pollen-tube passes to effect fertilization. *Embryo* with 2 cotyledons

DIVISION I. **Polypet'alæ.**

Flowers with both calyx and corolla (dichlamydeous). *Petals* free.—See also the exceptional *Monopetalæ*.

Exceptions. Flowers wanting either calyx or corolla occur in: 1 RANUNCULACEÆ; 6 CRUCIFERÆ (5 *Cardamine*, 16 *Senebiera*, and 17 *Lepidium*); 9 VIOLACEÆ (apetalous forms of *Viola*); 12 CARYOPHYLLEÆ (8 *Arenaria* § *Cherleria*, 9 *Sagina*); 26 ROSACEÆ (8 *Alchemilla*, 10 *Poterium*); 27 SAXIFRAGEÆ (2 *Chrysosplenium*); 30 HALORAGEÆ; 31 LYTHRACEÆ (2 *Peplis*); 32 ONAGRARIEÆ (2 *Ludwigia*).

Petals more or less connate or coherent occur in: 5 FUMARIACEÆ; 10 POLYGALEÆ; 13 PORTULACEÆ; 13* TAMARISCINEÆ; 16 MALVACEÆ; 20 ILICINEÆ; 28 CRASSULACEÆ (2 *Cotyledon*); 33 CUCURBITACEÆ.

SUB-DIVISION I. **Thalamiflo'ræ.** *Stamens* inserted on the receptacle (hypogynous), free from the calyx, or on a disk that terminates the pedicel. *Ovary* superior.

Exceptions. Stamens apparently perigynous or epigynous in 3 NYMPHÆACEÆ (1 *Nymphæa*) and in some 12 CARYOPHYLLEÆ.

* *Ovary apocarpous, carpels* 1 *or more; ovules sutural or basal.* (*See also* 16 Malvaceæ *and* 19 Geraniaceæ.)

1. RANUNCULACEÆ. *Flowers* regular or irregular. *Stamens* indefinite; anthers basifixed, opening by slits. *Seeds* albuminous.—Herbs with alternate leaves (except *Clematis*). (p. 1.)

2. BERBERIDEÆ. *Flowers* regular, 3-merous. *Stamens* definite, opposite the petals; anthers basifixed, opening by recurved valves. *Seeds* albuminous.—Shrubs; leaves alternate; flowers often showy. (p. 14.)

** *Ovary syncarpous,* 1-*celled* (*except* 3 Nymphæaceæ), *or* 2-*celled by a membranous septum; ovules parietal, rarely basal.*

3. NYMPHÆACEÆ. *Flowers* regular. *Stamens* indefinite; anthers basifixed. *Ovary* many-celled; *ovules* scattered over the walls of the cells; stigmas sessile. *Seeds* albuminous.—Water-herbs; flowers showy. (p. 15.)

4. PAPAVERACEÆ. *Flowers* regular, 2-merous. *Stamens* indefinite; anthers basifixed. *Ovules* parietal or on the surfaces of partial dissepiments; style 1 or stigmas sessile. *Seeds* albuminous.—Herbs; juice milky; leaves alternate, exstipulate; flowers usually showy. (p. 16.)

5. FUMARIACEÆ. *Flowers* irregular. *Sepals* 2. *Petals* 4. *Stamens* 6 in 2 bundles. *Ovary* 1-celled; ovules many parietal, or 1 (by suppression) basal; style 1 or 0. *Seeds* albuminous.—Weak herbs with exstipulate alternate leaves; flowers usually small. (p. 19.)

6. CRUCIFERÆ. *Flowers* usually regular. *Sepals* 4. *Petals* 4. *Stamens* usually 6, 4 longer than the others. *Ovary* 1–2-celled, of 2 carpels; ovules parietal; style 1 or 0. *Seeds* exalbuminous.—Herbs; leaves exstipulate, alternate; flowers usually small and ebracteate. (p. 22.)

7. RESEDACEÆ. *Flowers* irregular. *Sepals* and *petals* 4–7 each. *Stamens* indefinite. *Ovary* 1-celled, of 2–6 carpels, at length open at the top; ovules parietal; stigma sessile. *Seeds* exalbuminous.—Herbs; leaves alternate, stipules glandular or 0; flowers small, greenish. (p. 44.)

8. CISTINEÆ. *Flowers* regular. *Sepals* 3–5. *Petals* 5. *Stamens* indefinite. *Ovary* 1-celled, of 3 carpels; ovules parietal; styles 3. *Seeds* albuminous.—Shrubs; leaves usually stipulate; flowers yellow or red, showy; petals fugaceous. (p. 45.)

9. VIOLACEÆ. *Flowers* irregular. *Sepals*, *petals*, and *stamens* 5 each. *Ovary* 1-celled; ovules parietal; style 1. *Capsule* 3-valved, loculicidal. *Seeds* albuminous.—Herbs; leaves alternate, stipulate; flowers often showy. (p. 47.)

11. FRANKENIACEÆ. *Flowers* regular. *Sepals*, *petals*, and *stamens* 4–6 each. *Ovary* 1-celled, of 2–5 carpels; ovules parietal; style 1.—A littoral herb; leaves opposite, exstipulate; flowers small. (p. 51.)

**** Ovary syncarpous, 1-celled; placenta free-central or basal.*

12. CARYOPHYLLEÆ. *Flowers* regular. *Sepals* and *petals* 4 or 5 each. *Stamens* 8 or 10. *Ovules* many; styles 2–5. *Seeds* albuminous; embryo curved.—Herbs; leaves opposite, stipulate or not; flowers usually small and pink or white. (p. 52.)

13. PORTULACEÆ. *Flowers* regular. *Sepals* 2. *Petals* 4 or more. *Stamens* 3 or more. *Ovules* 2 or more; style 1, 2–3-fid. *Seeds* albuminous; embryo curved.—Herbs; leaves opposite or alternate, quite entire; flowers small. (p. 69.)

13*. TAMARISCINEÆ. *Flowers* regular. *Sepals* and *petals* 4–5 each. *Stamens* 4 or more. *Ovules* 2 or more; styles 3–4.—Shrubs; leaves minute, exstipulate; flowers small. (p. 70.)

***** Ovary syncarpous, 2- or more-celled; placentas axile.*

10. POLYGALEÆ. *Flowers* irregular. *Inner sepals* petaloid. *Petals* adnate to the staminal sheath. *Stamens* 8; anthers 1-celled. *Ovary* 2-celled, 2-ovuled; style 1.—Herbs; leaves alternate or subopposite, exstipulate; flowers small, usually blue. (p. 50.)

14. ELATINEÆ. *Flowers* regular. *Sepals* and *petals* 3–4 each. *Stamens* 3–4 or twice as many, free. *Ovary* 2–5-celled; styles 2–5. *Seeds* ribbed; albumen scanty or 0.—Water-herbs; leaves opposite, stipulate; flowers minute. (p. 71.)

15. HYPERICINEÆ. *Flowers* regular. *Sepals* and *petals* 5 each. *Stamens* many, united in bundles. *Ovary* more or less completely 3–5-celled, cells many-ovuled; styles 3–5. *Seeds* exalbuminous.—Herbs or shrubs; leaves opposite, often gland-dotted, exstipulate; flowers often showy, yellow. (p. 71.)

16. MALVACEÆ. *Flowers* regular. *Sepals* 5, valvate, persistent. *Petals* 5, twisted in bud, adnate to the staminal tube. *Stamens* monadelphous; anthers 1-celled. *Ovary* many-celled, cells 1-ovuled (in British genera). *Albumen* scanty or 0; embryo crumpled.—Herbs or shrubs; leaves alternate, stipulate; flowers often showy. (p. 74.)

17. TILIACEÆ. *Flowers* regular. *Sepals* 5, valvate, deciduous. *Petals* 5. *Stamens* indefinite; anthers 2-celled. *Ovary* 2–10-celled; cells 2-ovuled; style 1. *Seeds* albuminous.—Trees; leaves alternate, stipulate; flowers not showy. (p. 76.)

18. LINEÆ. *Flowers* regular. *Sepals* 4–5. *Petals* 4–5, convolute in bud. *Stamens* usually 4–5. *Ovary* 3–5- (–10-) celled, cells 1–2-ovuled; styles 3–5. *Seeds* albuminous.—Herbs; leaves opposite or alternate, narrow, quite entire, exstipulate; flowers usually showy. (p. 77.)

19. GERANIACEÆ. *Flowers* regular or not. *Sepals* 3–5. *Petals* 3–5, imbricate in bud. *Stamens* definite. *Ovary* 3–5-lobed and -celled; cells 1–many-ovuled; styles 1 or more. *Albumen* scanty or 0; cotyledons plaited or convolute.—Herbs; leaves opposite or alternate, usually stipulate; flowers often showy. (p. 79.)

20. ILICINEÆ. *Flowers* regular. *Sepals* 4–5. *Petals* 4–5, often connate, imbricate in bud. *Stamens* 4–5. *Ovary* 3–5-celled, cells 1–2-ovuled. *Seeds* albuminous.—Shrubs; leaves evergreen, alternate, exstipulate; flowers small. (p. 85.)

21. EMPETRACEÆ. *Flowers* regular, diœcious. *Sepals* 3. *Petals* 3, imbricate in bud. *Stamens* 3. *Ovary* 3–9-celled, cells 1-ovuled. *Seeds* albuminous.—Small shrubs; leaves evergreen, alternate, exstipulate; flowers inconspicuous. (p. 86.)

SUB-DIVISION II. **Calycifloræ.** *Stamens* inserted on the calyx or disk (perigynous or epigynous).—See also the exceptional *Thalamifloræ*.

Exceptions. Stamens hypogynous in 27 SAXIFRAGEÆ (3 *Parnassia*), and in 29 DROSERACEÆ; epipetalous in some 28 CRASSULACEÆ; almost hypogynous in some 25 LEGUMINOSÆ.

* *Ovary superior* (*except some* 26 Rosaceæ *and* 27 Saxifrageæ). *Stamens perigynous.*

22. CELASTRINEÆ. *Flowers* regular. *Calyx* 4–5-lobed, and *petals* 4–5, both imbricate in bud. *Stamens* 4–5, inserted on the disk. *Ovary* 3–5-celled, cells with 2 erect ovules. *Seeds* arillate; cotyledons foliaceous.—Trees or shrubs; leaves various; flowers small. (p. 87.)

23. RHAMNEÆ. *Flowers* regular. *Calyx* 4–5-lobed, valvate in bud. *Petals* 4–5, minute. *Stamens* 1 opposite each petal, inserted on the calyx-tube at the edge of the disk. *Ovary* 3-celled; ovule 1, erect in each cell.

—Shrubs ; leaves alternate or opposite, stipules small ; flowers inconspicuous. (p. 87.)

24. SAPINDACEÆ, *Tribe* ACERINEÆ. *Flowers* regular. *Calyx* 4–9-lobed, and *petals* 4–9, both imbricate in bud. *Stamens* 8–12, inserted on the disk. *Ovary* 2-lobed and -celled ; cells 2-ovuled. *Fruit* a samara ; cotyledons plaited.—Trees or shrubs ; leaves opposite ; flowers rather small, green. (p. 88.)

25. LEGUMINOSÆ. *Flowers* irregular, papilionaceous. *Stamens* 10, subhypogynous or inserted on the calyx-tube, all or 9 of them combined. *Ovary* of 1 carpel. *Fruit* a legume. *Albumen* 0.—Herbs or shrubs ; leaves usually alternate compound and stipulate. (p. 89.)

26. ROSACEÆ. *Flowers* regular. *Calyx* 4–5- (rarely 8–9-) lobed, imbricate or valvate in bud. *Petals* 4–5 (rarely 8–9 or 0), imbricate in bud. *Stamens* usually indefinite, inserted on the calyx-tube or disk, incurved in bud. *Ovary* of 1 or more free or connate 1- or more-ovuled carpels. *Fruit* various. *Albumen* 0.—Herbs or shrubs ; leaves usually alternate, stipulate ; flowers often showy. (p. 113.)

27. SAXIFRAGEÆ. *Flowers* regular. *Calyx* 4-5-lobed. *Petals* 4–5, rarely 0, imbricate in bud. *Stamens* definite. *Carpels* fewer than the petals, usually 2 connate ; placentas axile, rarely parietal. *Fruit* various. *Seeds* albuminous.—Herbs or shrubs ; leaves opposite or alternate, stipulate or not ; flowers small. (p. 138.)

28. CRASSULACEÆ. *Flowers* regular. *Calyx* 4–12-lobed. *Petals* 4-12. *Stamens* twice as many as the petals (except 1 *Tillæa*). *Carpels* follicular, usually 5, separate.—Herbs ; leaves succulent, exstipulate ; flowers small. (p. 145.)

29. DROSERACEÆ. *Flowers* regular *Sepals* and *petals* 5, imbricate in bud. *Stamens* as many, hypogynous or perigynous. *Ovary* 1-celled ; ovules many, parietal. *Fruit* capsular. *Seeds* albuminous.—Glandular herbs ; leaves radical ; flowers small, white or pink. (p. 149.)

31. LYTHRACEÆ. *Flowers* regular. *Calyx-lobes* 3–6, valvate in bud. *Petals* 3–6, crumpled in bud. *Stamens* definite. *Ovary* 2–6-celled, cells many-ovuled. *Capsule* many-seeded. *Seeds* exalbuminous.—Herbs ; leaves opposite or whorled, quite entire, exstipulate ; flowers often showy. (p. 153.)

** *Ovary inferior. Stamens epigynous.*

30. HALORAGEÆ. *Flowers* usually apetalous and 1-sexual. *Calyx-lobes* 2–4, valvate in bud, or 0. *Stamens* 1 or more, definite. *Ovary* 1–4-celled, cells 1-ovuled. *Seeds* albuminous.—Herbs, often marsh or aquatic ; leaves opposite alternate or whorled, exstipulate ; flowers very inconspicuous. (p. 151.)

32. ONAGRARIEÆ. *Flowers* usually regular. *Calyx-lobes* 2 or 4, valvate n bud. *Petals* 2 or 4, twisted in bud. *Stamens* definite. *Ovary* 1–4-elled, cells 1–many-seeded. *Seeds* exalbuminous.—Herbs ; leaves opposite or alternate, exstipulate ; flowers often showy. (p. 155.)

33. CUCURBITACEÆ. *Flowers* regular, 1-sexual. *Calyx* 5-toothed. *Corolla* 5-lobed. *Stamens* 3. *Ovary* 3-celled, many-ovuled. *Fruit* a berry. *Seeds* exalbuminous.—Herbs with tendrils; leaves alternate, exstipulate; flowers showy or not. (p. 160.)

34. UMBELLIFERÆ. *Flowers* usually regular. *Calyx-lobes* 5 or 0. *Petals* 5. *Stamens* 5, incurved in bud. *Ovary* 2-celled; styles 2; ovules solitary. *Fruit* of 2 separable indehiscent dry carpels. *Seeds* albuminous.—Herbs; leaves alternate; flowers usually umbelled, small. (p. 161.)

35. ARALIACEÆ. *Flowers* of *Umbelliferæ*, but shrubs or trees; ovary of often more than 2 carpels. *Fruit* of inseparable usually fleshy carpels. —Leaves alternate; flowers usually green. (p. 186.)

36. CORNACEÆ. *Flowers* regular. *Calyx-lobes* 4–5 or 0. *Petals* 4–5. *Stamens* 4–5. *Ovary* 2-celled, cells 1-ovuled; style simple. *Drupe* 1–2-celled. *Seeds* albuminous.—Herbs, shrubs, or trees; leaves opposite; flowers usually small. (p. 187.)

DIVISION II. **Monopet'alæ** or **Gamopet'alæ.**

Flowers with both calyx and corolla (dichlamydeous). *Petals* more or less connate into a 2- or more-lobed corolla.—See also various monopetalous genera under the exceptional *Polypetalæ*.

Exceptions. Petals free in 43 ERICACEÆ (11 *Pyrola* and 12 *Monotropa*) and 45 PLUMBAGINEÆ. Corolla absent in 47 OLEACEÆ (2 *Fraxinus*), and 46 PRIMULACEÆ (4 *Glaux*).

1. *Ovary* inferior.—See also 46 PRIMULACEÆ (8 *Samolus*).

* *Stamens epipetalous; see also* 42 CAMPANULACEÆ (1 Lobelia).

37. CAPRIFOLIACEÆ. *Flowers* regular or not. *Corolla-lobes* valvate or imbricate in bud. *Ovary* 1–5-celled, cells 1- or more-ovuled. *Seeds* albuminous.—Shrubs, rarely herbs; leaves opposite, exstipulate; flowers usually showy. (p. 188.)

38. RUBIACEÆ, *Tribe* STELLATÆ. *Flowers* regular. *Corolla-lobes* valvate in bud. *Ovary* 2-celled; cells 1-ovuled. *Seeds* albuminous.—Herbs; leaves whorled or opposite, exstipulate; flowers small or minute. (p. 191.)

39. VALERIANEÆ. *Flowers* irregular. *Corolla-lobes* imbricate. *Stamens* 1–3 or 5, free. *Ovary* 1–3-celled, one cell 1-ovuled; ovule pendulous. *Seeds* exalbuminous.—Herbs; leaves opposite; flowers small. (p. 196.)

40. DIPSACEÆ. *Flowers* regular or not, in involucrate heads. *Corolla-lobes* imbricate. *Stamens* 4. *Ovary* 1-celled; ovule 1, pendulous. *Seeds* albuminous.—Herbs; leaves opposite, exstipulate; flowers small. (p. 198.)

41. COMPOSITÆ. *Flowers* in involucrate heads. *Corolla-lobes* valvate. *Stamens* 4–5; anthers usually connate. *Ovary* 1-celled; ovule 1, erect. *Seeds* exalbuminous.—Herbs, rarely shrubs; leaves various, exstipulate; flowers small or minute. (p. 200).

** *Stamens inserted on the top of the ovary.*

42. CAMPANULACEÆ *Flowers* regular or irregular. *Stamens* 5, separate or connate. *Ovary* 2–8-celled, cells many-ovuled.—Herbs; juice milky; leaves alternate, exstipulate; flowers usually showy. (p. 243.)
43. ERICACEÆ, *Suborder* VACCINIEÆ. *Flowers* regular. *Stamens* 8 or 10. *Ovary* 4–5-celled.—Small shrubs; leaves alternate, exstipulate. (p. 249.)

2. *Ovary* superior. *Stamens* epipetalous (hypogynous in 43 ERICACEÆ, 47 OLEINEÆ (2 *Fraxinus*), 54 PLANTAGINEÆ (2 *Littorella*), and 45 PLUMBAGINEÆ).

* *Corolla regular. Stamens* 8 *or* 10, *rarely* 5 *or* 6; *anthers usually opening by pores. Ovary* 4–6-*celled.*

43. ERICACEÆ, *Suborder* ERICEÆ. Leafy shrubs or trees, rarely herbs. (p. 248.)
44. MONOTROPEÆ. Leafless parasitic herbs. (p. 257.)

** *Corolla regular. Stamens* 4–5, *opposite the corolla-lobes. Ovary* 1-*celled; placenta central.*

45. PLUMBAGINEÆ. *Styles* or *style-arms* 5. *Utricle* 1-seeded.—Maritime, rarely alpine, scapigerous herbs; flowers small. (p. 257.)
46. PRIMULACEÆ. *Style* 1. *Stigma* capitate. *Capsule* 5–10-valved or circumsciss, many-seeded.—Herbs; flowers often showy. (p. 260.)

*** *Corolla regular. Stamens* 2, 4, *or* 5, *alternate with the corolla-lobes. Ovary* 2-*celled. Leaves opposite* (*except* Menyanthes).

47. OLEACEÆ. *Calyx* 4-fid or 0. *Corolla* 4-lobed or 0. *Stamens* 2. *Ovary* 2-celled, cells 2–3-ovuled. *Fruit* a drupe or samara.—Trees or shrubs; leaves opposite, exstipulate. (p. 267.)
48. APOCYNACEÆ. *Calyx* 4–5 fid. *Corolla* 4–5-lobed, twisted in bud. *Stamens* 4–5; anthers basifixed. *Carpels* 2, free below. *Fruit* of 2 follicles.—Shrubs; leaves opposite, quite entire; flowers often showy. (p. 268.)
49. GENTIANEÆ. *Calyx* 4–8-fid. *Corolla* 4–8-lobed, twisted in bud. *Stamens* 4–8; anthers versatile. *Ovary* 1-celled; ovules many, parietal. *Fruit* usually capsular.—Herbs; leaves opposite, quite entire (alternate, 3-foliolate in *Menyanthes*); flowers often showy. (p. 269.)

**** *Corolla regular or subregular. Stamens* 4–5, *alternate with the corolla-lobes. Ovary* 2–4-*celled. Leaves alternate or radical.*

50. POLEMONIACEÆ. *Calyx* 5-lobed. *Corolla* 5-lobed, twisted in bud. *Stamens* 5. *Ovary* 3-celled; stigma 3-fid. *Fruit* capsular.—Herbs; leaves pinnate, exstipulate; flowers showy. (p. 274.)
51. BORAGINEÆ. *Calyx* 5-lobed, valvate in bud. *Corolla* 5-lobed, imbricate in bud. *Stamens* 5. *Ovary* of 2 2-lobed 2-celled 2-ovuled carpels.

Fruit of 4 nutlets.—Hispid or scabrid herbs; leaves alternate, quite entire, exstipulate; flowers often showy. (p. 275.)

52. CONVOLVULACEÆ. *Sepals* 5. *Corolla* 5-lobed, plaited and twisted in bud. *Stamens* 5. *Ovary* 2-celled, cells 2-ovuled; stigmas 2-fid or styles 2.—Herbs; leaves alternate, simple (0 in *Cuscuta*); flowers often showy. (p. 283.)

53. SOLANACEÆ. *Calyx* 5-fid. *Corolla* 5-lobed, imbricate, plaited or valvate in bud. *Stamens* 5, often cohering. *Ovary* 2-celled; ovules many, axile. *Fruit* a capsule or berry.—Herbs; leaves alternate or in pairs, exstipulate; flowers small or large. (p. 286.)

54. PLANTAGINEÆ. *Sepals* 4. *Corolla* scarious, 4-lobed, imbricate in bud. *Stamens* 4; anthers pendulous. *Ovary* 2–4-celled; style and stigma filiform. *Capsule* 1–4-celled.—Herbs; leaves alternate or radical; flowers inconspicuous. (*Littorella* is altogether anomalous.) (p. 288.)

***** *Corolla irregular, rarely subregular. Stamens* 2 *or* 4, *rarely* 5. *Ovary* 1–2-*celled, cells many ovuled. Leaves opposite or alternate.* (*See also* 53 Solanaceæ.)

55. SCROPHULARINEÆ. *Calyx* 4–5-merous. *Corolla* often 2-lipped, 4–5-lobed. *Stamens* 4, didynamous, rarely 2 or 5. *Ovary* 2-celled; ovules many, axile.—Herbs; leaves various; flowers often showy. (p. 290.)

56. OROBANCHACEÆ. *Sepals* 4 or 5, free or connate. *Corolla* gaping. *Stamens* 4, didynamous. *Ovary* 1-celled; ovules many, parietal.—Herbs, with alternate scales instead of leaves; flowers rather large, brown or coloured. (p. 308.)

57. LENTIBULARINEÆ. *Calyx* 2–5-partite. *Corolla* 2-labiate. *Stamens* 2. *Capsule* 2-valved, many-seeded.—Marsh or water-plants; flowers rather large for the plant. (p. 310.)

****** *Corolla irregular. Stamens* 2 *or* 4. *Ovary* 2- *or* 4-*celled, cells* 1-*ovuled.—Herbs or shrubs; leaves opposite or whorled, exstipulate.*

58. VERBENACEÆ. *Calyx* cleft or toothed. *Corolla* tubular, often 2-lipped. *Stamens* 4. *Ovary* not lobed, 2–4-celled; cells 1-ovuled. *Fruit* a drupe, berry, or of 1–4 nutlets.—Flowers small or showy. (p. 313.)

59. LABIATÆ. *Calyx* 5-cleft or 2-lipped. *Corolla* usually 2-lipped. *Stamens* 2 or 4, didynamous. *Ovary* of 2 2-lobed 2-celled 2-ovuled carpels. *Fruit* of 1–4 1-seeded nutlets.—Flowers in opposite cymes forming false whorls. (p. 313.)

DIVISION III. **Incompletæ.**

(**Monochlamydeæ and Achlamydeæ.**)

Corolla and often calyx absent.—(Petals present in some 60 *Illecebraceæ*. For various apetalous genera see Exceptions to the *Polypetalæ* and *Monopetalæ*.

* *Flowers not in catkins. Perianth single, inferior* (0 *in* Euphorbia).

60. ILLECEBRACEÆ. *Flowers* 2-sexual. *Calyx* herbaceous or coriaceous, persistent round the fruit. *Stamens* perigynous, opposite the sepals. *Ovary* 1-celled; styles 2–3; ovules 1–2. *Utricle* 1-seeded. *Albumen* floury, embryo various.—Herbs; leaves opposite, stipulate (except *Scleranthus*); flowers minute. (p. 333.)

61. CHENOPODIACEÆ. *Flowers* 1–2-sexual. *Calyx* 3–5-lobed, herbaceous, persistent round the fruit. *Stamens* 1–5, opposite the sepals. *Ovary* 1-celled; ovule amphitropous. *Utricle* 1-seeded, indehiscent. *Albumen* floury or fleshy; embryo annular or spiral.—Herbs; leaves opposite or alternate, exstipulate, or stems leafless and jointed; flowers green, inconspicuous. (p. 335.)

62. POLYGONACEÆ. *Flowers* usually 2-sexual. *Sepals* 3–6, green or coloured. *Stamens* 5–8, perigynous or hypogynous. *Fruit* usually enclosed in the sepals. *Ovules* erect, orthotropous. *Albumen* floury; embryo curved.—Herbs; leaves alternate; stipules sheathing; flowers small. (p. 343.)

64. THYMELÆACEÆ. *Flowers* 2-sexual. *Calyx* tubular; lobes 4–5. *Stamens* definite, inserted in the tube. *Ovules* pendulous, anatropous. *Albumen* 0 or scanty; embryo straight.—Shrubs; leaves quite entire, exstipulate; bark tenacious; flowers conspicuous, sweet-scented. (p. 353.)

65. ELÆAGNACEÆ. *Calyx*, in male fl. 3–4-sepalous; in female or 2-sexual fl. tubular. *Stamens* 4–8 at the base of the sepals in the male fl. *Ovule* erect, anatropous. *Albumen* 0 or scanty; embryo straight.—Shrubs with silvery scales; leaves quite entire, exstipulate; flowers inconspicuous. (p. 354.)

68. EUPHORBIACEÆ. *Flowers* 1-sexual. *Calyx* 0 or *sepals* 2 or more. *Male: Stamens* 1 or more; anthers didymous. *Female Ovary* 2–3-lobed and -celled; ovules 1–2 in each cell, pendulous, anatropous; styles 2–3. *Albumen* copious, fleshy.—Herbs or shrubs; leaves various; inflorescence often of many stamens and 1 pistil collected in a small calyx-like involucre. (p. 356.)

69. URTICACEÆ. *Flowers* 1–2-sexual. *Perianth* of male 3–8-lobed or -partite; of female tubular, or 3–5-cleft, or a scale. *Stamens* opposite the perianth-lobes. *Ovary* 1-celled; styles 1–2 or 0; ovule solitary, pendulous and anatropous, or erect and orthotropous. *Albumen* fleshy or 0.—Herbs or shrubs; leaves various, stipulate; flowers minute, green. (p. 361.)

73. CERATOPHYLLEÆ. *Flowers* 1-sexual. *Perianth* 8–12-partite, segments subulate.—*Male*, of many anthers. *Ovary* 1-celled; style subulate, persistent; ovule 1, pendulous, anatropous. *Albumen* 0.—A submerged herb, with whorled multifid leaves; flowers very inconspicuous. (p. 378.)

** *Flowers not in catkins. Perianth single, superior.*

66. LORANTHACEÆ. *Calyx* 4-cleft, valvate in bud. *Stamens* one

adnate to each calyx-lobe. *Ovary* 1-celled; ovule 1, adnate to the ovary. *Seed* erect, radicle superior; albumen fleshy.—Parasitic shrubs; leaves quite entire, exstipulate; flowers inconspicuous. (p. 354.)

67. SANTALACEÆ. *Calyx* 3–5-lobed, valvate in bud. *Stamens* one adnate to each calyx-lobe. *Ovary* 1-celled; ovules several, pendulous from a free central placenta. *Albumen* fleshy; radicle superior.—Shrubs or herbs, often root-parasites; leaves usually alternate, quite entire, exstipulate; flowers inconspicuous. (p. 355.)

63. ARISTOLOCHIACEÆ. *Calyx* 3-lobed, or 1–2-lipped, valvate in bud. *Stamens* 6–12, epigynous or gynandrous. *Ovary* 4–6-celled; ovules many. *Albumen* fleshy; embryo minute.—Herbs or shrubs; leaves alternate, exstipulate. (p. 351.)

**** Flowers 1-sexual; males in catkins, females in spikes or catkins. Perianth present or absent.*

70. MYRICACEÆ. *Flowers* of both sexes in the axils of imbricating bracts; perianth 0.—*Male* of 2–16 stamens; anthers basifixed, bursting outwards.—*Female:* *Ovary* 1-celled; styles 2, filiform; ovule 1, basal, orthotropous. *Fruit* a drupe. *Albumen* 0.—A glandular shrub; leaves alternate, exstipulate; flowers very inconspicuous. (p. 364.)

71. CUPULIFERÆ. *Flowers* mono-dicœcious. *Males* in catkins. *Sepals* 0 or 5 or more. *Stamens* 5–20.—*Females*, sessile in an involucre of free or connate bracts. *Calyx* superior, 5–6-toothed or 0. *Ovary* 2–3-celled; styles 2–3; cells 1–2-ovuled. *Fruit* 1-celled, 1-seeded, dry, indehiscent. *Albumen* 0.—Trees or shrubs; leaves alternate, stipulate; flowers small, green. (p. 364.)

72. SALICINEÆ. *Flowers* dicœcious, without perianth, both sexes in catkins.—*Male:* *Stamens* 1 or more.—*Female:* *Ovary* 1-celled; stigmas 2; ovules many, parietal, anatropous. *Capsule* 2-valved. *Albumen* 0.—Trees, leaves alternate, stipulate. (p. 369.)

SUB-CLASS II. **Gymnospermous Dicotyledons.** *Perianth* usually 0. *Ovules* not contained in close carpels, fertilized by the direct application of the pollen. *Embryo* with often whorled cotyledons.

74. CONIFERÆ. *Perianth* 0. *Male flowers* of 2–8-celled anthers, usually forming a deciduous catkin. *Female fl.* of one or more naked ovules (ovaries of some) on the scales of a cone or head, or of a solitary ovule (*Taxus*). *Albumen* fleshy; embryo straight.—Trees or shrubs; leaves alternate opposite or fascicled; flowers very inconspicuous. (p. 379.)

CLASS II. **Monocotyledonous** or **Endogenous** plants. *Stem* with the wood forming longitudinal bundles irregularly disposed in the stem, not in concentric layers, and having no defined central pith. *Leaves* with usually parallel veins. *Flowers* with the organs mostly in threes or fours, never in fives. *Embryo* with a single cotyledon; first formed leaves alternate; radicle not branching, but throwing out adventitious roots.

Exceptions. Leaves net-veined in 79 DIOSCOREÆ, 80 LILIACEÆ (1 *Paris*), and 84 AROIDEÆ (1 *Arum*). Flowers 4-merous in 86 NAIADACEÆ, and 2–3-merous in 89 GRAMINEÆ.

1. MICROSPERMEÆ. *Perianth* 2-seriate, coloured. *Ovary* inferior, syncarpous, 1- rarely 3–6-celled, placentas 3 parietal. *Seeds* minute, exalbuminous.

75. HYDROCHARIDEÆ. *Flowers* regular, 1-sexual. *Perianth* 6-partite, outer segments herbaceous, inner petaloid (except in *Elodea*). *Stamens* 3 or more. *Ovary* 1- or 3–6-celled. *Fruit* a berry.—Water plants; leaves erect or floating, flowers usually conspicuous. (p. 381.)

76. ORCHIDEÆ. *Flowers* irregular, 2-sexual. *Stamens* 1 or 2, adnate to the style. *Ovary* 1-celled. *Fruit* capsular.—Herbs of various habit. (p. 383.)

2. EPIGYNEÆ. *Perianth* 2-seriate, coloured (except Dioscoreæ). *Ovary* inferior, syncarpous, 3-celled. *Seeds* large, albuminous.

77. IRIDEÆ. *Flowers* 2-sexual. *Perianth* 6-partite, petaloid. *Stamens* 3, separate; anthers bursting outwards. *Ovary* 3-celled. *Capsule* 3-valved.—Herbs; roots tuberous, or rootstock creeping; leaves narrow; flowers usually handsome. (p. 395.)

78. AMARYLLIDEÆ. *Flowers* 2-sexual. *Perianth* 6-partite, petaloid. *Stamens* 6, separate; anthers bursting inwards. *Ovary* 3-celled. *Capsule* 3-valved.—Herbs; leaves narrow; flowers usually handsome. (p. 398.)

79. DIOSCOREÆ. *Flowers* 1-sexual. *Perianth* small, 6-partite, herbaceous. *Stamens* 6; anthers bursting inwards. *Ovary* 3-celled. *Berry* few-seeded.—Climbing herbs; leaves broad, with netted veins; flowers inconspicuous. (p. 400.)

3. CORONARIEÆ. *Perianth* 2-seriate, usually coloured. *Ovary* superior, syncarpous. *Seeds* albuminous.

80. LILIACEÆ. *Flowers* usually 2-sexual. *Perianth* usually 6-cleft or of 6 segments, petaloid. *Stamens* 6, opposite the perianth-segments. *Ovary* 3-celled. *Fruit* various.—Herbs (except *Ruscus*) of various habit; flowers usually showy. (p. 401.)

81. JUNCEÆ. *Flowers* 2-sexual. *Perianth* of 6 green or brown segments. *Stamens* usually 6. *Ovary* 1–3-celled with 3 basilar, or many parietal or axile ovules. *Capsule* 3-valved.—Rushy herbs; leaves very narrow; flowers brown, small. (p. 413.)

82. ERIOCAULONEÆ. *Flowers* monœcious, in involucrate heads. *Perianth* membranous or scarious; outer of 2–3 sepals; inner 3-lobed or of 3 scales. *Stamens* 2–3 on the inner perianth-segments. *Ovary* 2–3-celled; ovule 1, pendulous in each cell. *Capsule* 2–3-valved.—Usually scapigerous, cellular, marsh or water herbs; flowers small, dull-coloured. (p. 420.)

4. NUDIFLORÆ. *Perianth* 0, or rudimentary. *Ovary* superior, syncarpous, or monocarpellary.

83. TYPHACEÆ. *Flowers* monœcious, in catkins or heads. *Perianth* 0, or of scales or hairs. *Stamens* many; anthers basifixed. *Ovary* 1–2-celled; style persistent; ovule 1, pendulous. *Fruit* a drupe or utricle.—Erect marsh or water plants; leaves linear; flowers small or minute, in conspicuous spiked heads. (p. 421.)

84. AROIDEÆ. *Flowers* sessile on a spadix, enclosed in a spathe when young, 1–2-sexual. *Perianth* 0, or of scale-like sepals. *Stamens* few or many. *Ovary* 1- or more-celled. *Berry* few- or many-seeded. *Albumen* mealy.—Herbs; leaves various, often broad, net-veined; flowers with often conspicuous spathes or spadixes. (p. 423.)

85. LEMNACEÆ. Minute floating cellular green fronds. *Flowers* embedded in slits or cavities of the frond, most minute, 1–3 in a spathe. *Stamens* 1–2. *Ovary* 1-celled, 1–7-ovuled.—Fronds covering ponds; flowers very rare and inconspicuous. (p. 424.)

5. APOCARPEÆ. *Perianth* coloured and 2-seriate, or green 1-seriate, or imperfect, or 0. *Ovary* superior, apocarpous or monocarpellary. *Seeds* exalbuminous, cotyledonary end usually contracted hooked or coiled, rarely straight.

86. ALISMACEÆ. *Flowers* usually 2-sexual. *Perianth* 6-partite, inner segments or all petaloid. *Stamens* 6 or more. *Carpels* many. *Fruit* of many achenes; albumen 0; radicle very large.—Marsh or water herbs; flowers usually conspicuous. (p. 426.)

87. NAIADACEÆ. *Flowers* 1–2-sexual. *Perianth* of 4 valvate sepals, or imperfect, or 0. *Stamens* as many as the sepals, or fewer. *Carpels* 1–4, 1-ovuled. *Albumen* 0; radicle very large.—Marsh or water plants; flowers inconspicuous, green. (p. 428.)

6. GLUMACEÆ. *Perianth* 0, or of bristles or very minute scales. *Ovary* 1-celled, 1-ovuled; styles or stigmas 2–3. *Seeds* albuminous, embryo small. *Flowers* spicate, solitary in the axils of imbricating bracts (*glumes*).

88. CYPERACEÆ. *Flowers* 1–2-sexual. *Perianth* 0 or of bristles, rarely of scales. *Stamens* 1–3; anthers basifixed. *Ovary* 1-celled; style 1, stigmas 2–3 papillose; ovule 1, erect. *Fruit* compressed or 3-gonous. *Embryo* at the base of the albumen.—*Stem* usually solid, 3-gonous; leaves often grass-like, but with entire sheaths. (p. 439.)

89. GRAMINEÆ. *Flowers* usually 2-sexual. *Perianth* usually of 2 very minute scales. *Stamens* usually 3; anthers versatile. *Ovary* 1-celled, stigmas 1–2, hairy or feathery. *Fruit* terete, or grooved on one side. *Embryo* on one side of the base of the albumen.—*Stem* cylindrical, usually hollow, except at the joints; leaves with sheaths split to the base. (p. 466.)

SUB-KINGDOM II. **Cryptogams,** or **Acotyledons,** or **Flowerless** plants. *Plants* not provided with stamens and ovules as in Phænogams. *Seeds* represented by minute spores which contain no embryo.

CLASS I. **Acrogens.** Plants with a distinct stem.

SUB-CLASS **Vasculares.** *Stem* with vascular tissue. *Spores* contained in a spore case (*sporangium*), and developing a prothallus in germination.

* *Spores of one kind.*

90. FILICES. Sporangia usually very minute, situated on the margin or under surface of the leaf (frond); rarely larger, in separate spikes or panicles.—*Fronds* usually circinate in vernation. (p. 507.)

91. EQUISETACEÆ. Sporangia 2-valved, on the under side of peltate scales that are arranged in terminal cones. *Spores* with 4 filiform clubbed appendages rolled round them.—*Stems* erect from a creeping rootstock, cylindric, hollow, grooved, septate, simple or with whorled branches and with toothed sheaths at the joints. (p. 521.)

92. LYCOPODIACEÆ. Sporangia not very minute, situated in the axils of the leaves, or of the scales of a cone.—*Fronds* usually circinate in vernation. (p. 523.)

* *Spores of two kinds.*

93. SELAGINELLACEÆ. Sporangia not very minute, situated in the axils of the scales of a cone or at the bases of subulate leaves. Spores of 2 kinds; the larger developing a prothallus within its coat; the smaller containing antherozoids. Decumbent or prostrate plants with small imbricating leaves of 2 forms; or stemless water plants with subulate leaves. (p. 525.)

94. MARSILEACEÆ. Sporangia (membranous sacs) very minute, enclosed in the cells of a globose receptacle near the base of the frond. *Spores* of 2 kinds; the larger developing a prothallus; the smaller containing antherozoids.—Marsh or water plants, rarer on dry soils. (p. 526.)