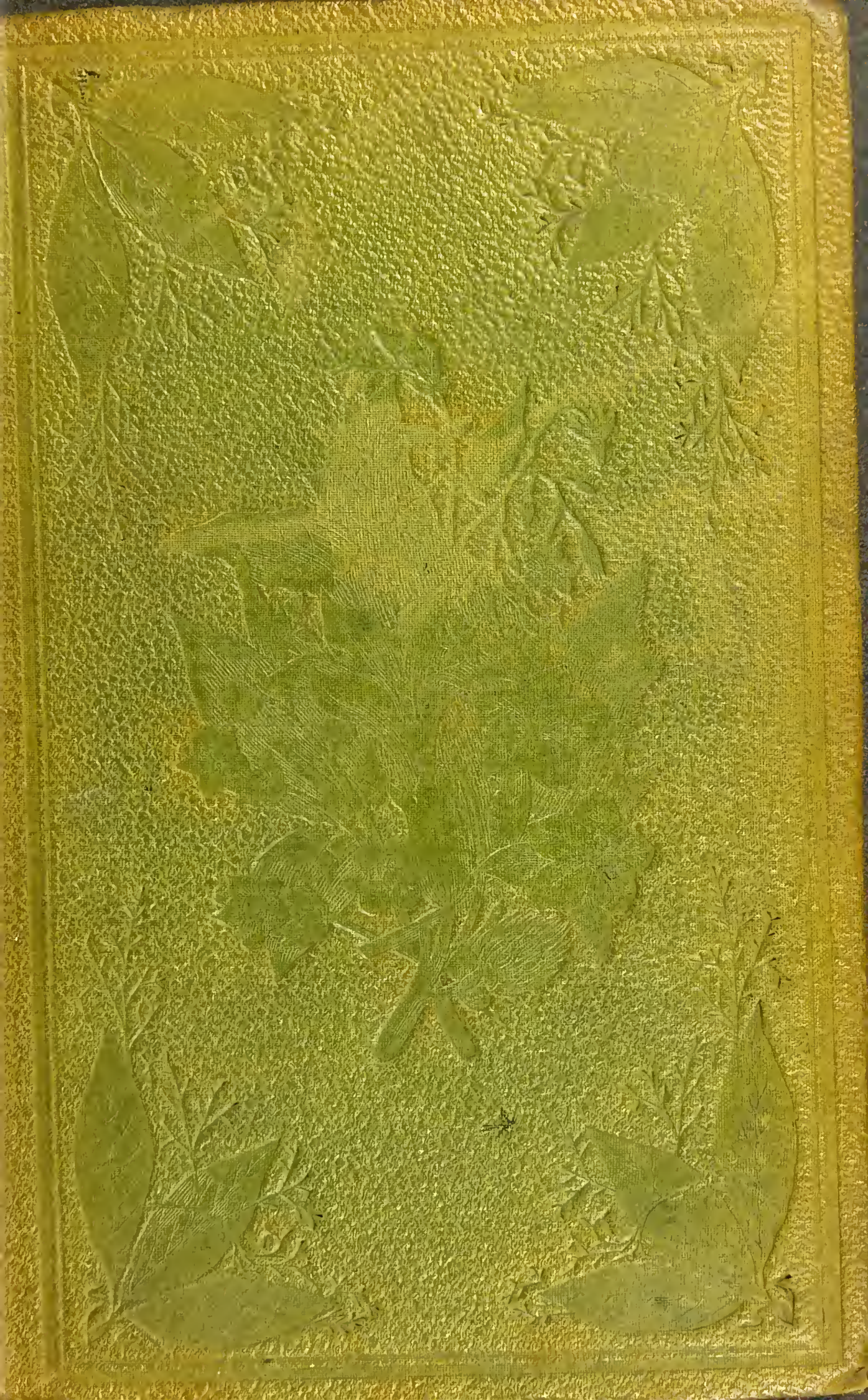

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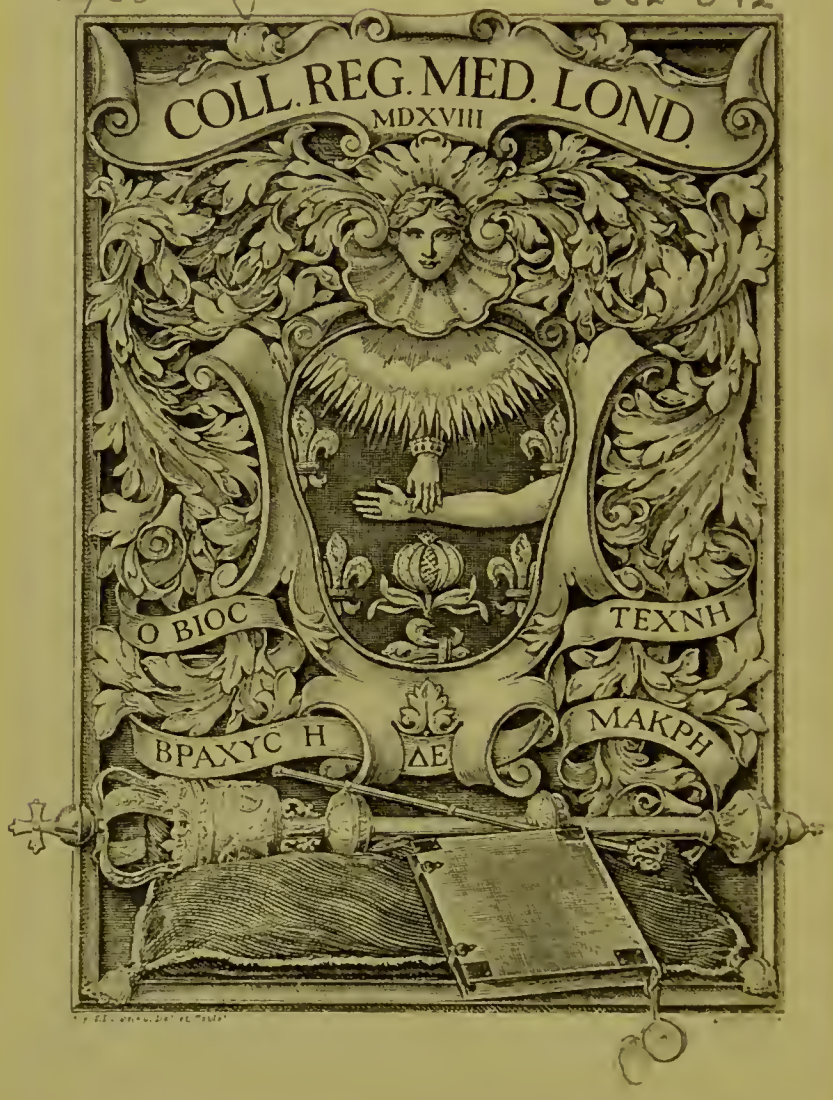

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Herbert R. Spencer

July 10. 1939

THE

BRITISH

GRASSES AND SEDGES.

BY ANNE PRATT,

AUTHOR OF "OUR NATIVE SONGSTERS," "WILD FLOWERS," ETC.

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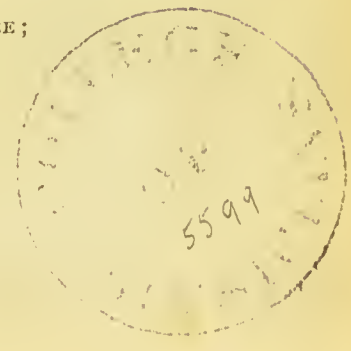

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LIST OF PLANTS

IN

BRITISH GRASSES AND SEDGES.

216 SPECIES FIGURED.

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		Plate	Fig.	Page
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		Plate	Fig.	Page
Phalaris arundinacea	Reed Canary-grass	250	2	58
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Phleum alpinum	Alpine Cat's-tail-grass	250	5	63
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Boehmeri	Purple-stalked Cat's-tail-grass	250	7	64
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distans	Reflexed Meadow-grass	259	4	87
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carinatus	Blunt-edged Club-rush	241	1	20
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maritimus	Salt Marsh Club-rush	241	2	20
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verticillata	Rough Bristle-grass	258	3	82
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alterniflora	Many-spiked Cord-grass	272	4	134
Stipa pennata	Common Feather-grass	251	4	66
Triodia decumbens	Decumbent Heath-grass	262	1	95

		Plate	Fig.	Page
Triticum caninum . . .	Fibrous-rooted Wheat-grass . . .	270	4	125
cristatum	Crested Wheat-grass	270	1	123
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*** *The Author and Artist must here express their thanks to* Richard Parnell, Esq., M.D., F.R.S.E., &c. &c., *who kindly permitted drawings to be made from various portions of his invaluable work on the Grasses of Britain.*

BRITISH GRASSES AND SEDGES.

Grasses constitute an important part of the vegetation of most temperate countries, forming large masses of verdure on plains and hill sides, and giving to the landscape that hue on which the eye can longest gaze untired, fringing the blue streams or crystal rills with their graceful leaves and flowers; or planted by the hand of man, in fields, ripening gradually from the delicate and tender blade of the Spring corn-fields into the rich brown of the full ear, which is to furnish our food. The Cereals, or corn grasses, are not natives of Britain; and of the large number of grasses which form the herbage of our fields, not more than twenty are fitted for the food of cattle. Many grasses grow even in water; some in running streams, others where the water is still. Some are peculiar to the mountains, others to the woodland; some to the sandy fields or shores, but not one will grow in the sea. Several grasses and sedges are invaluable, as, by the interlacing of their roots, they fix the ever-shifting sands; and without their aid we should often be overwhelmed by torrents of sand almost as fearful as those which appal the traveller in the desert. In other places grasses grow on upland and hilly ground, restraining

there the falling of the loose soil, while the wide-spread down, the chalky cliffs, and the wall top are made green by their presence. Besides their individual uses, they, in their mass, influence the healthy condition of the surrounding neighbourhood, for wherever this verdant covering of the earth is found it materially affects the atmosphere, especially with regard to the quantity of moisture; while the air which sweeps over the grass, laden with all the deleterious gases borne away from the crowded city, sweeps back again to the mass of mankind dwelling there, charged with a fresh supply of oxygen breathed forth from blades of grass and from leafy boughs, and replaces that which is vitiated by the respiration of man and animals.

Perhaps the season when the sight of the green meadows most delights us, is early Spring. How beautiful are they, as the sunlight comes down upon their gleaming blades, and the blue heavens are hanging over them! Every day the grass seems to become taller, and thicker, and greener. Multitudes of long slender leaves are blending with the foliage of various forms, which precede the Spring and Summer flowers, and

> "Grow like the summer grass, fastest by night
> Unseen, yet crescive in its beauty."

This rapidity of growth adds much to the interest with which we look on nature at this season. The scene of to-day is even richer than that of yesterday. It may be that a storm, accompanied by heavy rains, pours over field and valley, and its torrents might seem destined to beat down the tender grass to earth, and to strip the bending twigs of all their wealth of leaves. Yet that

storm shall but prepare the way for their quicker growth; for the electrical state of the atmosphere which follows it, is, of all conditions, most favourable to the rapid increase of vegetation.

The grassy turf which makes our meadows so bright and beautiful, and which adorns the landscape also of other countries in the colder portion of the temperate zone, is almost entirely absent from those lands on which the sun shines with its fullest power. Even in Southern Europe, where meadow lands more seldom occur, there begins to be some assimilation in the general appearance of the grasses to the taller species of lower latitudes; and reeds, which are with us of moderate size, rival the tree-like grasses which form so characteristic a feature of tropical scenery. The species of grass found in warmer lands are mostly different from those of our country, though some genera—*Poa*, for instance—are very widely distributed, and some species of this genus are found in all varieties of climate. Wherever we find grasses, we see them growing more or less socially. Tropical grasses are not only taller than ours, but they have flowers more downy and elegant, and broader leaves. The noble plants of the Bamboo family rise to the height of trees, forming, both in tropical and sub-tropical zones, vast and impenetrable forests; their slender stalks, reclining branches, and tall grassy leaves, reminding the native of northern countries of the willows of his own land, yet far excelling these in grace and beauty. Taller than even alders and oaks, these tree-like grasses wave more gracefully before the winds than our sturdy trees can do, and give a cheerful and airy aspect to the forest by their

light and tremulous motion, and their smoothly-polished yellow stems; while the gigantic sugar-cane family, though not so numerous, are scarcely less beautiful, as they wave their silvery flowers so gracefully to the wind.

In these warm regions the want of green meadows is not felt. The "cattle on a thousand hills" of the colder climate, are not needed in these; and the great Creator has spread therefore no vast pastures for their supply. The Hindoo who can dine on a dish of plantain or of rice, would be injured by any great quantity of animal food, and is directed by instinct to a vegetable diet. A slight herbage rises up at all times of the year, after the sudden shower or the long-continued rain; and this being sufficient to supply food for the horses, no hay is made in the East. During the rainy season, there are, in some tropical countries, extensive tracts of grass; as, for instance, in the savannahs of America; but they are unmixed with wild flowers, such as our daisy, clover, and buttercup, and present no uniform mass of green-sward, and are often as tall as the traveller who is passing through them. Grasses of various kinds are to be found in more or less abundance from the equator to the poles. Several grasses, like the Alpine Foxtail, grow in the coldest regions in great luxuriance; and the Esquimaux, dwelling in the seventy-third degree of north latitude, has large patches of herbage green as an English meadow. Dr. Lindley remarks, "The great mass of herbage, known by the name of sedges and grasses, constitutes perhaps a twelfth part of the described species of flowering plants; and at least nine-tenths of the number of individuals composing the vegetation of the world."

Corn-fields are not less pleasing to our sense of beauty than grassy meadows; and, whether clad in the tender green of the Spring blade, or the full brown of Summer, enliven and enrich our landscape. Many grasses beside those which are cultivated, afford seeds equally nutritious, though smaller in size. Indeed, the wheat, on which we depend so largely for food, and the origin of which was, till lately, undiscovered, seems now proved, by M. Fabre's experiments, to be but the cultivated form of the Ægilops, a grass infesting barley-fields on the shores of the Mediterranean. The grass, when wild, produces very small grains; but this botanist found on sowing it, summer after summer, that a crop of good wheat finally arose from its seeds.

When we consider how small the grains of corn are, it seems wonderful that man should have ever cultivated the cereal grasses for his nourishment. No doubt, the earliest cultivators were influenced in their choice of plants by the social growth of the grasses; and so, observing men, finding that plants bearing these nutritive seeds grew together in great numbers, sowed them on lands where they were wanting—where they could be protected from injury, and whence they could be gathered in their season.

Wherever now we see a corn-field waving in beauty, whether in the climes of east or west, or by the quiet homesteads which lie among the hills and valleys of our native land, it tells of peace, civilization, and domestic happiness; it tells of homes. The men who sowed the grains from which sprung those towering blades are not wild wanderers over the earth. Man must have a spot

to call his own, ere he will rise up early and work late, sowing the seed, or gathering in the ripened fruit; and the tillage of the earth brings with it softer manners, and gradual improvement in the arts and sciences of civilised life. The house is reared, and children learn beneath its roof the love of kindred, of neighbours, and of country; and agriculture proves the source alike of individual and of national prosperity.

A thorough knowledge of even the small number of grasses which adorn our meadows, fields, and woods, will demand a little patient study. The genera and species are now, however, by the labours of successive botanists, so well understood, and can be described by characters so distinct, that the student, aided by the plates, will find little real difficulty in obtaining a good acquaintance with this interesting and useful tribe of plants. Some of the varieties require considerable attention, as those of some species are very different in appearance from the type from which they have varied; and some grasses described as species will probably yet be found to be but varieties, changed by accidental circumstances of soil or situation. With few exceptions, the characteristics of the grasses can be detected by the help of a good pocket-lens; although a few genera, like those of *Agrostis* and *Aira*, in consequence of the small size of the spikelets, require examination with the microscope.

The term "grass," as employed by agriculturists, frequently has a far more extensive signification than that to which it is limited by the botanist, being applied to clover (called "three-leaf grass"), plantain, sorrel, and

many other flowering plants, which ordinarily form a constituent part of a hay-crop. This use of the word may be very convenient to those who, in their intercourse with each other, require some such comprehensive term which may include grasses and other plants fit for forming good pasture-land, or for being converted into hay; but the naturalist understands by "grass," such plants only as fall under the description given below of the GRAMINEÆ, a Natural Order of the Sub-class GLUMACEÆ. To this division it is altogether improbable that the botanist, however elementary may be his knowledge, will assign any of the flowering plants described in the preceding volumes; yet it is by no means so certain that the young student may not confound with the grasses other members of the Glumaceous Tribe belonging to the CYPERACEÆ, or Sedges; for these resemble the grasses so closely in their more obvious characters, that it requires a somewhat practised eye to discriminate them. The points in which the two Natural Orders agree are these:—the leaves are long, narrow, often channelled above, and pointed; they proceed mainly from the root, and grow in tufts: in both, the flowers are destitute of petals, being composed of scales or glumes, and are elevated on a straw-like stem, where they form terminal spikelets or heads, which are either erect or drooping. The characters in which the sedges obviously differ from the grasses are, that in the former the leaves are generally rigid and more or less of a sea-green or glaucous hue; the flower-stem is angular instead of round, solid or pithy and not hollow, and not jointed at the point from which a stem-leaf arises; and in those cases in which the

stem-leaf is furnished with a sheathing base, that sheath is never split. The separation of the two Orders is therefore so clearly a natural one, that a practised eye can at once decide to which of the two divisions any given specimen should be referred, no matter what may be its stage of growth—and that without minutely examining that part (the inflorescence, namely,) on which the distinction is in reality founded.

Not only in outward appearance, but in properties also, the sedges differ from the grasses. Growing often side by side, on dry heaths, in marshes, meadows, woods, on mountain tops, or on the sandy sea-shore, the grasses abound in starch and sugar, substances highly conducive to the nutriment of cattle; the sedges are remarkably deficient in them, and do not rank as "grass," even in the agricultural sense of the term; so that while the Glumaceæ comprise nearly all the plants which in the temperate regions are essential to man and the animals that he has domesticated, the Cyperaceæ are "weeds," unprofitable for food—and very frequently, like tares among wheat, appropriating soil and nourishment, which but for them would afford space and nurture for their more valuable neighbours. They must not, however, be denounced as utterly useless, nor are they even all to be classed with the "thorns and thistles,"—which, in accordance with the primeval curse, conveyed by implication a blessing on industry; the roots of several species are medicinal; the tubers of *Cypérus esculentus*, called by the French "Souchet comestible," or "Amande de terre," are used as food in the South of Europe, and are employed in the preparation of orgeat; and several species

of the same genus are cultivated in India and China for the wholesome food afforded by their tubers, which are said to resemble potatoes or yams. Nor must we forget, that, to the tribe of CYPERÁCEÆ, or Sedges, belongs the *Papýrus antiquórum*, which furnished the simplest and earliest of writing materials. In our own country one species is employed in making baskets and chair-bottoms; and others are eminently useful in binding together, by their creeping roots, the wandering sea-sands, or strengthening the banks of rivers and canals against the encroaching action of the water. Owing to the minuteness of the parts of fructification, and the close affinity which exists between many of the species, they are difficult of discrimination, and require to be studied with patience and accuracy. It is hoped, however, that the following descriptions, which have been divested as much as possible of technical terms, will enable the reader, assisted by the plates, to determine the names of at least the most strongly-marked species.

The extensive and difficult genus *Carex*, is divided below into several groups; and the student is recommended, before he begins to compare his specimen with either description or figures, to satisfy himself thoroughly, as to which group, and to which division of a group, it should be referred; otherwise he may happen to grow bewildered and to fling down his plant in despair.

ORDERS AND GENERA OF GRASSES AND SEDGES.

The large Sub-Class GLUMÁCEÆ (Glumaceous Plants) consists of two Orders, CYPERÁCEÆ and GRAMÍNEÆ; the former, containing the Sedges and their allies; the latter, the true Grasses. They differ from ordinary flowering plants in having their stamens and pistils enclosed in husks or glumes, instead of calyx and corolla.

ORDER CYPERÁCEÆ. SEDGES AND THEIR ALLIES.

Flowers either with stamens and pistils, or with stamens or pistils only; the lower ones often neuter, that is, without either stamens or pistils; each *flower* enclosed within a *single* scale or glume; *glumes* imbricated round a common central column, forming a *spikelet* or head, each glume occasionally enclosing a membranous investment of the stamens and ovary; *stamens* generally 3; *anthers* 2-celled, fixed by their base; *ovary* 1-celled, often surrounded by *bristles*; *style* 3-cleft, or rarely 2-cleft; *stigmas* undivided; *fruit* a 1-seeded nut.

* *Flowers with both stamens and pistils; glumes in two ranks.*

1. CYPÉRUS (Galingale).—*Spikelets* 2-ranked; *glumes* numerous, keeled, nearly all fertile; *bristles* wanting. Name, the Greek name of the plant.

2. Schœnus (Bog-rush).—*Spikelets* 2-ranked, 1—4-flowered; *glumes* 6—9, outer ones smaller, empty; *bristles* small, or wanting. Name in Greek denoting "a cord," which was sometimes made from plants of this tribe.

** *Flowers with both stamens and pistils; glumes imbricated on all sides.*

3. Cládium (Twig-rush).—*Glumes* about 6 in a spikelet, the outer ones smallest, and all but one or two empty; *bristles* wanting; *fruit* a coated nut. Name in Greek denoting "a twig."

4. Rhyncóspora (Beak-rush).—*Spikelets* few-flowered; *glumes* about 6, the outer ones smaller and empty; *bristles* about 6; *nut* slightly flattened, crowned with the dilated base of the style. Name of Greek origin, and signifying "beak-seed."

5. Blysmus.—*Spikelets* arranged in the form of a 2-ranked spike; *glumes* imbricated on all sides, the outer ones longer and empty; *bristles* several; *nut* slightly flattened on one side, gradually tapering into the hardened style. Name in Greek denoting "a spring," near which plants of the genus grow.

6. Eleócharis (Spike-rush).—*Spikelet* many-flowered, solitary, terminal; *glumes* nearly all fertile, the outer largest; *bristles* 2—6, short; *style* 2—3-cleft, jointed upon the germen; *fruit* crowned with the permanent base of the style. Name from the Greek *elos*, a marsh, and *chairo*, to rejoice.

7. Isólepis (Mud-rush).—*Spikelets* many-flowered, terminal; *glumes* nearly all equal and fertile; *bristles* wanting; *styles* 2—3-cleft, not thickened at the base,

falling off; *fruit* slightly pointed, or not at all. Name in Greek denoting equal scales.

8. Scirpus.—*Spikelets* many-flowered, terminal; *glumes* equal, one or two of the outer sometimes barren; *bristles* about 6; *styles* 2—3, not jointed at the base, falling off; *fruit* slightly pointed, or not at all.* Name from the Celtic *cirs*, a cord.

9. Eriophorum (Cotton-grass).—*Glumes* imbricated on all sides, nearly equal; *bristles* finally assuming the form of long silky hair. Name from the Greek *erion*, wool, and *phero*, to bear.

*** *Stamens and pistils in separate flowers.*

10. Kobrésia.—*Spikelets* of 2 flowers, the upper one bearing stamens, the lower a pistil, and included within a sheathing scale.

11. Carex (Sedge).—*Glumes* collected into imbricated spikes; *fertile flower* of 1 pistil with 2—3 stigmas, invested by an urceolate † corolla, which is persistent and becomes the outer part of the fruit, enclosing the nut; barren flower of 3 stamens, corolla wanting. Name from the Greek *keiro*, to cut, from the sharpness of its leaves.

I. Cyperus (Galingale).

1. *C. longus* (Sweet or English Galingale).—*Spikelets*

* The plants contained in these three genera—*Eleócharis*, *Isólepis*, and *Scirpus*—are very difficult of discrimination, and appear to be admitted to a new arrangement by every botanist that treats of them. That of Hooker and Arnott is here adopted, as being the most recent.

† From the Latin *urceus*, an oblong vessel, swollen in the middle, and contracted above and below.

1 SWEET CYPERUS
Cyperus longus

2 BROWN C
C fuscus

3 BLACK BOG RUSH
Schœnus nigricans

narrow, pointed, in erect twice-compound umbels; general *bracts* very long, leafy; partial, short; *stem* triangular; *root* creeping. A handsome but very rare plant, found only in a few marshes in various parts of England. The umbel is leafy and composed of unequal rays; the glumes are of a reddish brown hue, with green keels and whitish margins; the stem is from 2—3 feet high, and is sheathed at the base with several long leaves, after the habit of the larger sedges. The root is succulent, and filled with a nutritive and agreeable mucilage, to which a highly aromatic bitter principle is added, having tonic and stomachic properties. It flowers in July and August. (Pl. 238*, f. 1.)

2. *C. fuscus* (Brown Cypérus).—*Spikelets* narrow, pointed, collected into small roundish terminal heads; *glumes* spreading; *bracts* 3, unequal; *root* fibrous. A small inconspicuous plant, only a few inches long, with fibrous roots and numerous trailing stems, first discovered in a meadow near Little Chelsea, and since found on Shalford Common, near Godalming, Surrey. It flowers in August and September. (Pl. 238*, f. 2.) The genus *Cypérus*, which, from the useful properties of many of the plants that it contains, has been with propriety selected to give a name to the Order Cyperáceæ, comprises little short of 250 species, nearly all of which inhabit the warmer regions of the globe, increasing in numbers and luxuriance as we approach the Line. The genus *Carex*, on the contrary, is most abundant in high latitudes, where, according to Humboldt, it equals the grasses, and towards the Tropics dwindles away and almost disappears. Of *Cypérus*, two species only are

found in England; in Scotland none. The genus *Carex* contains upwards of sixty British species.

2. Schœnus (Bog-rush).

1. *S. nígricans* (Black Bog-rush).—The only British species. A rush-like plant, from eight to twelve inches high, composed of numerous erect, rigid, nearly round stems, some of which are barren, while others terminate in an abrupt head of black glumes, of which the outer one assumes the form of a bract and overtops the rest. The stems are clasped at their base by several blackish sheaths, terminating in short rigid leaves. The roots are composed of many long tough fibres, which extend to a considerable distance in the turfy bogs where the plants grow. The flowers, which are somewhat conspicuous from their large yellow anthers, appear in June. (Pl. 238*, f. 3.)

3. Cládium (Twig-rush).

1. *C. Maríscus* (Prickly Twig-rush).—The only British species. A tall and robust marsh-plant, 3—4 feet high, with a strong, cane-like stem and very long narrow leaves, which, at the edges and keel, are armed with minute recurved teeth, like those of a fine saw, and terminate in a tapering triangular point. The stem is nearly round and bears several leaves, and the numerous spikelets are arranged in the form of a compound leafy panicle. It inhabits marshes and fens in several of the English counties, from Cornwall to Cheshire, and is most abundant in Cambridgeshire. It is also plentiful in Galloway, Scotland. It flowers

1 PRICKLY TWIG RUSH,
Cladium mariscus.

2 WHITE BEAK R.,
Rhynchospora alba.

3 BROWN B. R.,
R. fusca.

4 BROAD LEAVED BLYSMUS,
Blysmus compressus.

5 NARROW L. R.,
B. rufus

6 CREEPING SPIKE RUSH,
Eleocharis palustris

7 MANY STALKED S. R.,
E. multicaulis

8 LEAST S. R.,
E. acicularis.

in July and August. There are usually about six glumes in a spikelet, of which only two or three bear flowers, and of these rarely more than one perfects fruit, which, when mature, is nearly as large as the spikelet. (Pl. 239, f. 1.)

4. Rhynchóspora (Beak-rush).

1. *R. alba* (White Beak-rush).—*Stem* divided, leafy, each branch bearing an abrupt crowded cluster of spikelets; outer *glumes* scarcely overtopping the spikelets. A slender grass-like plant, with stems about a foot high, several of which proceed from one root, and are accompanied by long narrow leaves. The flowers are of a singularly white colour, recalling the hue of straw bleached by the sun. It flowers from July to August, and is not uncommon in peaty bogs. (Pl. 239, f. 2.)

2. *R. fusca* (Brown Beak-rush).—*Stem* leafy, bearing several oval heads of spikelets, which are overtopped by the leaf-like outer glumes. A rare plant, inhabiting bogs in Ireland and the south-west of England. In habit it resembles the last, but may at once be distinguished by its rich brown heads of flowers, which are accompanied by one or more long bracts, and its extremely narrow, almost bristle-like leaves. It flowers from July to August. (Pl. 239, f. 3.)

5. Blysmus (Blysmus).

1. *B. compréssus* (Broad-leaved Blysmus).—*Stem* somewhat triangular; *spikelets* 6—8-flowered; outer

glume of the lowest spikelet with a leafy point; *leaves* flat and rough at the edges and keel. (Pl. 239, f. 4.)

2. *B. rúfus* (Narrow-leaved Blysmus).—*Stem* round; *spikelets* about 4-flowered; *glumes* all alike; *leaves* very narrow, smooth. The two species of *Blysmus* may be at once distinguished from all other Cyperáceæ by bearing their spikelets arranged on opposite sides of the stem, after the habit of wheat, or rye-grass. The stem of *B. compréssus* is from 6—8 inches high, and it grows in boggy pastures, often near the sea. *B. rúfus* is more slender and rigid, and is found in similar situations. Both species flower in July. (Pl. 239, f. 5.)

6. Eleócharis (Spike-rush).

1. *E. palústris* (Creeping Spike-rush).—*Stigmas* 2; *fruit* crowned with the flattened base of the style, shorter than the bristles. A rush-like plant, 2—3 feet high, destitute of leaves, and sending up from its widely-creeping root rounded stems, abruptly sheathed at the base, each of which terminates in a solitary oblong spikelet. Sides of lakes and ponds, common, flowering in June. (Pl. 239, f. 6.)

2. *E. multicaúlis* (Many-stalked Spike-rush).—*Stigmas* 3; *fruit* crowned with the triangular base of the style, longer than the bristles. Resembling the last, but smaller. The author has found specimens, the spikelets of which are viviparous, and bear plants furnished with roots and embryo spikelets. Flowering at the same time, and in similar situations, with the last. (Pl. 239, f. 7.)

3. *E. aciculáris* (Least Spike-rush).—*Stigmas* 3; *fruit* crowned with the almost globose base of the style;

1 FLOATING ISOLEPIS.
Isolepis fluitans

2 BRISTLE STALKED MUD RUSH.
I. setacea

3 SAVI'S M. R.
I. savii

4 ROUND CULTELLED HEADED M. R.
I. Holoschœnus

5 LAKE CLUB R.
Scirpus lacustris

6 GLAUCOUS C. R.
S. glaucus

7 TRIANGULAR C. R.
S. triquetrus

8 SHARP C. R.
S. acutus

bristles 2—3; *stems* tufted, round, exceedingly slender. A humble plant, 3—4 inches high, frequent among other marsh plants on the sides of lakes and in damp heathy places. It approaches in habit *Isólepis Sávii* and *I. setácea*, from which, however, it may be at once distinguished by the absence of bracts. It flowers from June to August. (Pl. 239, f. 8.)

7. Isólepis (Mud-rush).

1. *I. flúitans* (Floating Mud-rush).—*Spikelet* solitary, terminal; *stigmas* 2; *stem* floating, flattened, branched. A tufted grass-like aquatic, with numerous zig-zag stems 3—6 inches long, short sheathing leaves, and small ovate green spikelets, flowering from June to August. Common in lakes and ponds. (Pl. 240, f. 1.)

2. *I. setácea* (Bristle-stalked Mud-rush).—*Spikelets* 1 or 2, with an erect bract at the base, which greatly overtops the spikes; *stigmas* 3; *fruit* longitudinally ribbed and transversely striated. A humble plant, 3—6 inches high, forming dense tufts of very slender stems, which are leafy at the base. Common in wet gravelly places, and flowering in July and August. (Pl. 240, f. 2.)

3. *I. Sávii* (Savi's Mud-rush).—*Spikelets* 1—3, with 1 or 2 spreading bracts, of which the longer slightly overtops the spikes; *stigmas* 3; *fruit* dotted, not furrowed. Closely resembling the last, from which, however, it may well be distinguished by the above character, and by its brighter green hue. It is common in the west of England, where it inhabits

bogs, and is found also in Scotland and Ireland, generally near the sea. Of late years it has been commonly exposed for sale in Covent Garden under the name of Isidore. Planted in a pot, and set to stand in a saucer of water, it soon fills the pot with innumerable evergreen bristling stems, which spread in all directions, and present a very pleasing appearance. The roots, meanwhile, penetrate into the saucer, which they line with a tangled mass of fibres. In its wild state it flowers in July and August. (Pl. 240, f. 3.)

4. *I. Holoschænus* (Round cluster-headed Mud-rush). —*Spikelets* collected into globular heads. A distinct and very handsome rush-like plant, with round robust stems, 3—4 feet high, from about six or eight inches below the summit of which proceeds a panicle of six to twenty globular heads, of the size of small marbles, accompanied by a long spreading or deflexed bract. Said to grow on the sandy coast of Somerset and Devon, though no specific locality appears to be named but Braunton Burrows, an extensive tract of sand on the north coast of Devon. Here it undoubtedly grows, but can scarcely be discovered without some labour and difficulty, owing to the tangled jungle of grass and rushes, which must be penetrated and searched by the botanist. It flowers in August and September. (Pl. 240, f. 4.)

8. Scirpus (Club-rush and Bull-rush).

* *Spikelets numerous; stem round.*

1. *S. lacústris* (Common Bull-rush).—*Spikelets* forming a dense compound terminal panicle; *glumes* notched

and fringed, smooth. Margins of lakes and in running water abundant, varying, according to the depth of the water, from 4—8 feet high. This is one of the few British Cyperáceæ applied to any economical purpose, being often made into mats, and, when twisted, being also used to form the seats of what are called rush-bottomed chairs. Coopers also employ them in the caulking of casks. Many persons are in the habit of applying the term "Bull-rush" to any tall rush-like aquatic, especially to plants of the genus *Typha*, to which last the name Reed-mace is far more appropriate. It flowers from June to August. (Pl. 241, f. 5.)

2. *S. Tabernæmontáni* (Glaucous Bull-rush).—*Spikelets* forming a loose compound terminal panicle; *glumes* notched and fringed, rough. Closely resembling the last in habit, but much smaller, seldom exceeding the height of two feet, and readily distinguished by the glaucous hue of its stems. In the west of England it is far the commoner species of the two, and is very abundant also on the banks of the Clyde. It grows also in many other places, especially near the sea. It flowers from June to August. (Pl. 240, f. 6.)

** *Spikelets numerous; stem triangular, leafless above; stigmas* 2.

3. *S. tríqueter* (Triangular Club-rush).—*Spikelets* clustered, some stalked, overtopped by the acutely triangular stem; *glumes* notched, the lobes blunt. Muddy banks of the Thames near London, and in the river Arun, Sussex, growing from 3—4 feet high, and flowering in June and July. (Pl. 240, f. 7.)

4. *S. púngens* (Sharp Club-rush).—*Spikelets* about 3, sessile, surmounted by the acutely triangular stem; *glumes* notched, the lobes acute. Not a British plant, though, like many others, unduly admitted into the English Flora as being a native of Jersey. (Pl. 240, f. 8.)

5. *S. carinátus* (Blunt-edged Club-rush).—*Stem* round below, obtusely triangular above; *spikelets* in a compound terminal panicle. Growing in the same localities as *S. tríqueter*, where it attains a height of 2—4 feet; very rare, flowering in July and August. (Pl. 241, f. 1.)

**** Spikelets numerous; stem triangular, leafy; stigmas* 3.

6. *S. marítimus* (Salt Marsh Club-rush).—*Spikelets* arranged in several stalked and sessile clusters; *bracts* several, long and leafy. Common in salt marshes on most parts of the coast, where it flowers in July and August, forming large grassy tufts of long flat leaves, which frequently overtop the clusters of brown spikelets. Both leaves and stems are very harsh to the touch. (Pl. 241, f. 2.)

7. *S. sylváticus* (Wood Club-rush).—*Spikelets* forming a many-times-compounded terminal panicle; *bracts* several, very long, leaf-like. Moist woods, most frequent in the south of Scotland, but abundant also in South Kent, and occasionally met with on the banks of the Tamar, Devonshire. A robust and handsome species, 3—4 feet high, with broad and flat leaves, and a very large number of small green spikelets, clustered together in groups of two or three. It flowers in July. (Pl. 241, f. 3.)

1 BLUNT EDGED CLUB RUSH
Scirpus carinatus
2 SALT MARSH C R
S. maritimus.
3 WOOD C R
S. sylvaticus
4 CHOCOLATE HEADED C R
S. pauciflorus.
5 SCALY STALKED C R
S. caespitosus.

1 [illegible] COTTON GRASS
Eriophorum alpinum

2 [illegible]
E. vaginatum

3 [illegible] BLADED C. G.
E. capitatum

4 BROAD LEAVED C. G.
E. latifolium

5 NARROW LEAVED C. G.
E. angustifolium

6 SLENDER C. G.
E. [illegible]

**** *Spikelet solitary, terminal; stigmas* 3.

8. *S. pauciflórus* (Chocolate-headed Club-rush).—*Stem* round; *sheaths* leafless; two outer *glumes* obtuse, shorter than the spike. Boggy moors and commons in Scotland, and several parts of England. The stems are 4—10 inches high, resembling in habit those of *Eleócharis palústris*, but well distinguished by the above characters, as well as by the differently formed fruit. It flowers in July and August. (Pl. 241, f. 4.)

9. *S. cæspitósus* (Scaly-stalked Club-rush).—*Stem* nearly round; *sheaths* with narrow awl-shaped leaves; two outer *glumes* acute, longer than the spikelet. Moist heaths, common. A small plant, 2—4 inches high, with numerous erect stems, many of which bear no spikelets. "This plant is called *Deer's Hair* in the Highlands, and yields an abundant food to sheep on the mountains in spring."—*Sir W. J. Hooker*. It flowers in June and July. (Pl. 241, f. 5.)

9. Eriόphorum (Cotton-grass).

* *Spikelet solitary.*

1. *E. alpínum* (Alpine Cotton-grass).—*Stem* triangular, rough; *leaves* much shorter than their sheaths; *spikelet* oblong. An elegant little plant, which formerly grew in the Moss of Restenet, near Forfar, but has disappeared in consequence of the Moss being drained. (Pl. 242, f. 1.)

2. *E. vaginátum* (Hare-tail Cotton-grass).—*Stem* round below, triangular above; lower *sheaths* of the stem terminating in long leaves, upper one leafless,

inflated; *Spikelet* oblong. A strikingly handsome plant, from 12—14 inches high, not unfrequently found in great abundance on damp moors, where it flowers in spring, but is made conspicuous later in the season by the enlarged bristles of the flower, which assume the appearance of white floss silk. Each spikelet is about an inch and a half in diameter on a slender stalk, three-fourths of the upper portion of which is naked. Near the base is a loose striated sheath, and the very narrow leaves which clasp the stem are furnished with sheaths of the same character. (Pl. 242, f. 2.)

3. *E. capitátum* (Round-headed Cotton-grass).—*Stem* round throughout; lower *sheaths* bearing short leaves, upper one leafless. Resembling the last in habit, but smaller. Once found by Mr. G. Don, by a rivulet on Ben Lawers, near perpetual snow. It flowered late in summer. (Pl. 242, f. 3.)

** *Spikelets more than one.*

4. *E. latifólium* (Broad-leaved Cotton-grass).—*Stem* in its upper half triangular; *stalks of the spikelets* rough; *leaves* flat, becoming triangular above the middle. Flowering in May and June, in boggy ground; rather rare. (Pl. 242, f. 4.)

5. *E. angustifólium* (Narrow-leaved Cotton-grass).—*Stem* round or nearly so; *stalks of the spikelets* smooth; *leaves* becoming triangular below the middle. Boggy and peaty ground, common; flowering in May and June. (Pl. 242, f. 5.)

6. *E. grácile* (Slender Cotton-grass).—*Stem* slightly triangular; *stalks of the spikelets* downy; *leaves* triangular

throughout. Boggy ground, rare. This species grows near Hagnaby, Yorkshire, at Whitemoor Pond, near Guildford; on Ben Lawers and the Clova Mountains; and at Cwm Idwell, North Wales. It flowers in July. (Pl. 242, f. 6.)

Great difference of opinion exists among botanists as to the number of species to which the many-spiked Cotton-grasses should be reduced. The three above described appear to be distinct; and if the number and comparative length of the bristles be taken into consideration, several others may be added. *E. angustifólium* is by far the most common, and, without doubt, the most beautiful. Enlivening, as it frequently does, extensive tracts of moorland with its silky tufts, too delicate apparently to bear the gentlest breeze, yet bending unhurt before the sweeping gale, it converts the desert waste, as it were, into a flower-garden. For, though it is not in its perfect beauty until its seeds are matured, the heads of dazzling white down have on the landscape the effect of flowers, and might be mistaken at a distance for clusters of gigantic snowdrops, springing from a strange soil at a season yet more strange. It grows from twelve to eighteen inches high. With the silky substance which invests the seeds, paper and wicks of candles have been made and pillows stuffed. A foreign species, *E. comósum*, is remarkable for the toughness of its leaves, and is extensively employed in the Himalayas, under the name of *Bhabhur*, in rope-making.

10. Kobrésia.

1. *K. caricína* (Compound-headed Kobrésia).—An unpretending little plant, with the habit of one of the lesser Sedges, or the short robust form of Sheep's Fescue grass. The *stem* is erect and rigid, from 6—12 inches high. The *spikelets*, each of which contains two flowers, are collected into four or five small spikes, and these are aggregated at the summit of the stem. The fertile flower contains one pistil with three stigmas; the barren, three stamens. The lowest bract is somewhat larger than the rest; the nut is obscurely triangular, and is included within the sheathing scale. The leaves are much shorter than the stem, tufted and curved. It grows, forming densely tufted masses, on moors in the North, and flowers in August. Some botanists describe it under the name of *Elýna caricína*. (Pl. 243, f. 1.)

11. Cárex (Sedge).

i. *Spikelet simple, solitary. Stigmas* 2.

* *Stamens and pistils on different plants.*

1. *C. dioíca* (Creeping Separate-headed Sedge).—*Fertile spikelet* egg-shaped; *glumes* obtuse; *fruit* ascending or horizontal (not deflexed); *barren spikelet* slender; *leaves* and *stem* smooth; *root* creeping. A slender plant, about 6 inches high, growing in spongy bogs, and flowering in May and June. Not common. (Pl. 249, f. 2.)

2. *C. Davalliána* (Prickly Separate-headed Sedge).—*Fruit* tapering to a point, rough, deflexed; *leaves* and *stem* rough; *root* tufted. Resembling the last, and

7 CURVED C
C incurva
8 OVAL SPIKED C
C ovalis
9 LITTLE PRICKLY C
C. stellulata
10 WHITE C
C canescens
11 HARE'S FOOT C
C leporina
12 LONGATED C
C elongata

about the same size. It formerly grew at Lansdown, near Bath, but is now extinct. (Pl. 243, f. 3.)

** *Stamens and pistils in separate flowers on the same spikelet.*

3. *C. pulicáris* (Flea Sedge).—*Spikelet* slender, the upper half bearing stamens, the lower pistils; *fruit* tapering to a point at each end, glossy, at first erect, finally deflexed. A pretty little plant, from 6—10 inches high, common in bogs and moist moorland. The slender stem, scarcely thicker than a horsehair, bears from six to twelve shining brown seeds, which are distant from each other, and when ripe bear a strange resemblance to insects, clustering like aphides round the stem. The upper portion of the spikelet which bears the stamens remains unaltered. The leaves are tufted, long, and bristle-shaped. It flowers in May and June. (Pl. 243, f. 4.)

ii. *Spikelet simple, solitary. Stigmas* 3.

4. *C. rupéstris* (Rock Sedge).—*Spikelet* very slender, with the upper half barren, and a few fertile flowers at the base; *fruit* actually triangular, erect; *leaves* flat, terminating in a long curling point. A very rare plant, from 3—6 inches high, growing on shelves of rocks in a few places in the Highlands, and flowering in August. (Pl. 243, f. 5.)

5. *C. pauciflóra* (Few-flowered Sedge).—*Spikelet* of from four to six flowers, the two upper barren; *fruit* tapering to a very long point, nearly cylindrical, deflexed; *leaves* flat, much shorter than the stem. Not unlike

C. pulicáris, from which, however, it may at once be distinguished by its much slenderer fruit, which is of a pale yellow colour, and by its shorter leaves. It is not unfrequent in the Highlands, where it grows in moory places, and has also been discovered in Northumberland. It flowers in June. (Pl. 243, f. 6.)

iii. *Spike compound, some flowers in each spikelet bearing stamens* (*barren*), *and some pistils* (*fertile*). *Stigmas* 2.

* *Spikelets crowded into a head.*

6. *C. incúrva* (Curved Sedge). — *Spikelets* barren above, fertile below, crowded into a roundish head. A well-marked species, inhabiting sandy sea-shores in the north of Scotland. The root, or rather underground stem, creeps extensively an inch or two beneath the surface of the sand, sending up, at intervals of two or three inches, one or more tufts of leaves and a head of flowers, which last, as it approaches maturity, bends down until it touches the sand. The true roots, which are long, fibrous, and tufted, issue from the main stem nearly opposite the leaves. The heads are large, but are rarely elevated more than two inches from the ground. Flowering in June. (Pl. 243, f. 7.)

** *Spikelets alternate, barren at the base, fertile above.*

7. *C. ovális* (Oval-spiked Sedge).—*Spikelets* 5—6, oval, 1 terminal, the rest inserted, about half the length of a spikelet, one below another; *fruit* as long as the calyx, ovate, with a rough membranous margin tapering

to a point which is 2-cleft. Common in marshy places. A somewhat slender plant with long grassy leaves, triangular stems, and brownish green shining spikelets, without conspicuous bracts. It flowers in June and July. (Pl. 243, f. 8.)

8. *C. stellulàta* (Little Prickly Sedge).—*Spikelets* 3—4, roundish, rather distant; *fruit* angular, with a long beak, rough at the margin, spreading when ripe. Marshy ground, common. A slender plant from 12—18 inches high, with long grassy leaves, well distinguished by its roundish spikelets of fruit, which grow about 7—8 together, each in the form of a star. It flowers in May and June. (Pl. 243, f. 9.)

9. *C. cúrta* (White Sedge).—*Spikelets* 5—6, rather distant, especially the lower ones; *fruit* elliptical, with a very short beak, about equal in length to the *glumes*. A slender plant from 12—18 inches high, having something of the habit of *C. ovális*. The *spikelets*, however, are not more than half as large, more distant; and the *glumes* are of a peculiar whitish hue, with green keels. It grows in bogs, but is rare, and flowers in June. (Pl. 243, f. 10.)

10. *C. leporína* (Hare's-foot Sedge).—*Spikelets* 3, rarely 4, ovate, crowded; *fruit* elliptical, tapering to a point, equalling in length the ovate obtuse scales. A very rare plant, found in 1836 on the west side of Loch-na-gar, with a stem from 4—8 inches high, smooth and triangular. The *glumes* are reddish, with the margins paler; *fruit* yellow. (Pl. 243, f. 11.)

11. *C. elongáta* (Elongated Sedge).—*Spikelets* numerous, oblong, rather distant; *fruit* oblong, tapering to a

point, scarcely beaked, but bearing the persistent style, longer than the *glumes*. Marshes, rare, in the north of England. A stoutish plant 1—2 feet high, with acutely triangular stems, which are rough as well as the leaves. The *glumes* are brown, with a greenish keel and white edges. Upper *spikelets* crowded; lower, distant from one another about their own length. Flowering in June. (Pl. 243, f. 12.)

12. *C. remóta* (Distant-spiked Sedge).—*Spikelets* several, all single, approximate towards the top, but very distant below; *fruit* oblong, ovate, acute, the beak deeply 2-cleft; *bracts* very long, overtopping the stem. Moist places, common. A slender plant, from a foot to a foot and a half high, with from 6—8 small pale green spikelets and very long narrow leafy bracts, the lowest of which overtops the stem several inches; the upper ones are gradually shorter. It flowers in June. (Pl. 243, f. 13.)

13. *C. axilláris* (Axillary-clustered Sedge).—*Spikelets* several, the upper ones single, close together, the lower in distant groups of two or more; *fruit* oblong, ovate, acute, the upper part serrated, the beak deeply 2-cleft; *bract* of the lower compound spikelet longer, the others shorter than the spikelets; *glumes* shorter than the fruit. Marshes. A rare species, well distinguished by the above characters from the foregoing, which it resembles in many respects. Flowers in June. (Pl. 244, f. 1.)

14. *C. Boenninghausiána* (Boenninghausen's Sedge).—*Spikelets* several, the upper ones simple, close together, the lower distant, compound; *fruit* narrow, tapering to a point, the upper part serrated; *bract* of the lower compound spikelet overtopping the stem; *glumes* equalling

1 [illegible] CLUSTERED CAREX
Carex axillaris

[illegible] C.
C. boenninghausiana

[illegible] C.
C. paniculata

[illegible] C.
C. paradoxa

5 [illegible] C.
C. [illegible]

6 GREAT C.
C. vulpina

7 GRAY C.
C. divulsa

8 GREATER PICKLY C.
C. [illegible]

9 SEA C.
C. [illegible]

the fruit. Marshes, rare. Closely allied to the preceding. It flowers in June. (Pl. 244, f. 2.)

*** *Spikelets alternate, barren at their extremity, compound.*

15. *C. paniculáta* (Great Panicled Sedge).—*Spike* compound, consisting of numerous ovate stalked spikelets, which are themselves compound; *fruit* flat on one side, convex on the other, many-nerved, and ending in a winged triangular beak; *stem* rough, triangular, with flat sides. A common and picturesque plant, from 4—5 feet high, inhabiting spongy bogs, where it forms elevated tussacks or tufts after the habit of *Aira cæspitósa*, and is of much service in consolidating the soil. The *leaves* are long, broad, and very rough at the margins. It flowers in June. (Pl. 244, f. 3.)

16. *C. paradóxa* (Paradoxical Sedge).—*Spike* compound, narrow; *fruit* much the same as in the preceding, except that the beak is not winged; *stem* rough above, triangular, with convex sides. Resembling the last in habit, but much smaller, being from 1—2 feet high, very rare, having been found only in two localities in Yorkshire and one near Mullingar. It flowers in July. (Pl. 244, f. 4.)

17. *C. teretiúscula* (Lesser Panicled Sedge).—*Spike* compound, oblong, consisting of numerous crowded spikelets; *fruit* resembling that of *C. paniculáta*; *stem* like that of *C. paradóxa*. Boggy meadows, rare. Resembling in many respects *C. paniculáta*, but very much smaller, and forming less decided tussacks. Boggy meadows; June. (Pl. 244, f. 5.)

18. *C. vulpína* (Great Sedge).—*Spike* cylindrical, consisting of numerous crowded compound spikelets; *fruit* large, terminating in a long rough beak; *stem* acutely triangular. Wet places, common. A robust plant 2—3 feet high, with broad leaves, which are so rough at the margins as to be dangerous to meddle with; the stem is equally rough, and terminates in heads of fruit, which, when ripe, point in all directions. It flowers in June. (Pl. 244, f. 6.)

**** *Spikelets alternate, barren at their extremity, simple.*

19. *C. divúlsa* (Grey Sedge).—*Spikelets* about 6, the lower ones distant; *lower bracts* rather longer than the spikelets, bristle-shaped; *fruit* large, pointed, roughish near the extremity. A slender species, with long narrow rough *leaves*, growing from 1—2 feet high, and remarkable for its greyish hue. Frequent in most shady places, and flowering in May and June. (Pl. 244, f. 7.)

20. *C. muricáta* (Greater Prickly Sedge).—*Spikelets* from 4—6, crowded; *bracts* nearly all shorter than the spikelets. Gravelly pastures, frequent. So closely resembling the last in all respects, that the two are very difficult of discrimination, if indeed they do not represent two forms of the same plant varied by soil and situation. Flowering in May and June. (Pl. 244, f. 8.)

21. *C. arenária* (Sea Sedge).—*Spikelets* of three kinds, upper barren, lower fertile, intermediate ones barren at their extremities, forming an oblong, acute, interrupted head; *lower bracts* longer than the spikelets. A very distinct species, abundant on the sandy sea-shore,

where it is of great service in preventing the shifting of the sands. The *roots*, or rather subterraneous stems, creep to a great distance a few inches below the surface. They are about as large as whipcord, and are invested with the remains of old leaf-sheaths, presenting a jointed appearance. From these, tufts of leaves and flowers arise at intervals of a few inches, and from the joints descend tufted fibrous roots, with here and there a stouter cord-like root which penetrates to a great depth; the *leaves* are rigid, rough at the edges, and of a glaucous hue; the *stems* are also rough above, and from 6—12 inches high, flowering in June. (Pl. 244, f. 9.)

22. *C. intermédia* (Soft Brown Sedge).—*Spike* composed of numerous ascending acute spikelets, of which the upper and lower are fertile, the middle barren; *lower bracts* longer than the spikelets. Marshes and wet meadows, common. Bearing in many respects a close resemblance to *C. arenária*, yet perfectly distinct: it attains double the height, the leaves are more grass-like, and the mature spike is singularly marked by being separated into two portions by the remains of the barren spikelets. Indeed, at all stages of its growth, the middle portion of the spike differs in appearance from the two extremities, by which peculiarity it may be distinguished from all other British Sedges. It flowers in June. (Pl. 245, f. 1.)

23. *C. divísa* (Bracteated Marsh Sedge).—*Spike* oblong ovate, composed of several spikelets, the lower one of which is furnished with a slender leaf-like *bract*. A slender plant about a foot high, with light green grass-like *leaves* and a creeping *root;* inhabiting marshy

places, especially near the sea, principally on the southern and eastern coasts, and flowering in May and June. (Pl. 245, f. 2.)

iv. *Terminal spikelet fertile above, barren below; the rest fertile. Stigmas* 3.

24. *C. Váhlii* (Close-headed Alpine Sedge).—*Spikelets* 3—4, clustering; *fruit* obovate, rough above, longer than the glumes. Very rare, on rocks in the Highlands, flowering in July. Well marked by its dark purple-brown spikelets, the lower ones of which are nearly round when in fruit, and accompanied by a short leafy bract; the upper spikelet is cylindrical and more pointed. The *stem*, which is triangular, is from 6—12 inches high. It flowers in July. (Pl. 245, f. 3.)

25. *C. canéscens* (Hoary Sedge).—*Spikelets* 3—5, sessile, except the lowest, which is stalked. A very rare species from 1—2 feet high, found only on a small island in Lough Neagh, Ireland, flowering in July. (Pl. 245, f. 5.)

26. *C. atráta* (Black Sedge).—*Spikelets* 3—4, ovate, stalked, finally drooping. A rare species, found on Snowdon and the Highland mountains. It attains the height of about a foot, and is remarkable for its unusually broad leaves, and the dark purple-brown hue of its glumes. It flowers in June. (Pl. 245, f. 5.)

v. *One (or sometimes two) terminal spikelets, barren; the rest fertile.*

* *Stigmas* 2.

27. *C. vulgáris* (Common Sedge).—*Spikelets* from 4—6, cylindrical; *bracts* leafy, dilated at the base, and forming

small round dark auricles; *glumes* obtuse, dark purple-brown; *fruit* elliptical, with a very short beak. Common in marshes and wet pastures, where it flowers in May and June, growing about a foot high, with a slender, acutely triangular *stem*, which is rough towards the top *leaves* long and slender. (Pl. 245, f. 6.)

28. *C. rígida* (Rigid Sedge).—*Spikelets* oblong, 3—6; *lower bract* leafy, longer than its spikelet, with small round black auricles; *glumes* obtuse, black. On Snowdon and the Highland Mountains, from 4—6 inches high, forming numerous tufts of rigid acute *leaves*, which are as long as the *stem*. It flowers in June and July. (Pl. 245, f. 7.)

29. *C. aquátilis* (Straight-leaved Water Sedge).—*Spikelets* long and slender, tapering towards the base, and often having barren flowers at the extremities; *stem* smooth, usually triangular; *leaves* long and straight. Very rare. Bogs in the Clova mountains, where it flowers in July and August. (Pl. 245, f. 8.)

30. *C. acúta* (Slender-spiked Sedge).—*Spikelets* long and slender, the lower ones frequently barren at the top; *bracts* very long, leafy, frequently overtopping the stem; *auricles* lengthened, pale. A large species from 2—3 feet high, with broad flat *leaves*, which are inserted in three rows, and stout *stems*, which are acutely triangular and rough. The fertile spikelets are very long, and droop. Frequent in marshes and moist pastures, where it flowers in May. (Pl. 245, f. 9.)

31. *C. cæspitósa* (Tufted Bog Sedge).—*Spikelets* cylindrical, the lower ones often barren at the top; *lower bract* leafy, not longer than the spikelet; *auricles* long,

pale. Marshes, common. Approaching the last, but growing in more decided tufts; the *leaves*, too, are narrower, and have a glaucous hue. It grows from 2 —3 feet high, and flowers in April and May. (Pl. 245, f. 10.)

32. *C. saxátilis* (Russet Sedge).—*Fertile spikelets* ovate, obtuse, the lower one stalked; *bracts* leafy; *fruit* inflated, spreading, beaked. A distinct species, well marked by the above characters, as well as by its triangular, pointed *leaves*, and very dark *fruit*. Rare, near springs on the Scottish mountains, where it attains the height of a foot or more, flowering in June. (Pl. 246, f. 1.)

** *Stigmas* 3; *fruit smooth; fertile spikelets short, sessile, or nearly so.*

33. *C. palléscens* (Pale Sedge).—*Fertile spikelets* oblong, the lowest stalked, slightly pendulous; *bracts* leafy, slightly sheathing at the base; *fruit* obovate, obtuse, tipped by the base of the withered style. A slender species, a foot or more high, well marked by its pale hue, and blunt fruit. Common in marshes, and flowering in June. (Pl. 246, f. 2.)

34. *C. exténsa* (Long-bracteated Sedge).—*Fertile spikelets* roundish, oblong; *glumes* terminating in a sharp point; *bracts* very long, leafy; *fruit* beaked; *leaves* very narrow. Marshes near the sea, rare. Devonshire, near Liverpool, and Ireland. (Pl. 246, f. 3.)

*** *Stigmas* 3; *fruit smooth; fertile spikelets stalked, erect.*

35. *C. fláva* (Yellow Sedge).—*Bracts* very long, leaf-like, sheathing the stalks of the fertile spikelets, and giving

1. RUSSET CAREX. *Carex saxatilis.*
2. PALE C. *C. pallescens*
3. LONG BRACTEATED C. *C. extensa*
4. YELLOW C. *C. flava*
5. TAWNY C. *C. fulva*
6. LOOSE C. *C. diandra*
7. GREEN RIBBED C. *C. binervis*
8. SMOOTH STALKED BEAKED C. *C. laevigata*.
9. PINK LEAVED C. *C. panicea*
10. STOUT BROWN SPIKED C. *C. vaginata*
11. STARVED WOOD C. *C. depauperata*

them the appearance of being sessile; *fertile spikelets* distant; *fruit* swollen, spreading, with a long recurved beak. Common in turfy bogs. A slender leafy species of a pale yellowish green hue, growing a foot high, and flowering in May and June. (Pl. 246, f. 4.)

36. *C. fúlva* (Tawny Sedge).—*Fertile spikelets* 1—3, oblong, ovate; *bracts* leafy, sheathing, not overtopping the barren spikelets; *glumes* acute; *fruit* erect, with a straight rough-edged beak; *stem* rough. A slender plant about a foot high, not unfrequent in boggy places, marked by its leafy stem, by the long sheath which accompanies the lower bract, and by its short spikelets. It flowers in June. (Pl. 246, f. 5.)

37. *C. dístans* (Loose Sedge).—*Fertile spikelets* 2—3, distant, oblong; *bracts* leafy, shining, not overtopping the barren spike; *glumes* terminating in a sudden sharp point; *fruit* equally ribbed on both sides, triangular, beaked. (Pl. 246, f. 6.)

38. *C. binérvis* (Green-ribbed Smooth-stalked Beaked Sedge).—Very like the last, except that the *fruit* has two principal green ribs on the outside. It is exceedingly difficult to discriminate between these two plants; if indeed they are not forms of the same. *C. dístans* varies in height from six inches to a foot, and grows in marshy places, mostly near the sea. *C. binérvis* is abundant on dry moors and mountainous woods, attaining a height of from 2—4 feet, and is remarkable for its slender *stems*, which frequently droop on all sides from the weight of the spikelets; the *glumes* of the fertile spikelets are of a dark purple hue, with a green midrib; the *leaves* are from 6—8 inches long, channelled;

rigid, and rough edged. Both plants flower about June. (Pl. 246, f. 7.)

39. *C. lævigáta* (Smooth-stalked Beaked Sedge).—*Fertile spikelets* 3 or 4, distant, on long stalks, the lower ones frequently drooping; *fruit* distinctly furrowed, tapering to a long smooth-edged beak; *bracts* leaf-like, sheathing. Moist woods, not common. Approaching *C. dístans* in habit, but well distinguished by the above characters as well as by its much longer and broader leaves. In Bickleigh Vale, Devon, the two species grow near each other, and retain their distinctive characters very decidedly. It flowers in June. (Pl. 246, f. 8.)

40. *C. panícea* (Pink-leaved Sedge).—*Fertile spikelets* two or three, loose; *glumes* bluntish, with a green midrib; *bracts* leafy, sheathing, the lowest about as long as the spike, the rest shorter; *fruit* somewhat inflated, blunt. A distinct and very pretty plant, from 10—18 inches high, common in marshes and damp meadows, well marked by its foliage, resembling in hue that of the garden pink, its loose spikelets with purple glumes and green fruit, and the numerous yellow anthers of its barren spikelet. The *stems* are smooth and obtusely triangular. It flowers in June. (Pl. 246, f. 9.)

41. *C. vagináta* (Short Brown-spiked Sedge).—Resembling the last, except that the fruit is beaked. On the Highland mountains, rare; flowering in July. (Pl. 246, f. 10.)

42. *C. depauperáta* (Starved Wood Sedge).—*Fertile spikelets* 3 or 4, each containing about the same number of flowers; *bracts* leaf-like, very long; *fruit* large and

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terminating in a long beak. Dry woods, very rare. Godalming, Surrey; Charlton Wood, Kent, and near Forfar, where it flowers in May and June. A strongly marked species, with pale foliage and erect habit, the leaf-like bracts sometimes overtopping the slender terminal spikelet. (Pl. 246, f. 11.)

**** *Stigmas* 3; *fruit smooth; fertile spikelets stalked, drooping, short.*

43. *C. capilláris* (Dwarf Capillary Sedge).—*Spikelets* in long stalks, several sheathed by a common bract. A plant of humble growth from 2—6 inches high, bearing 3 or 4 few-flowered, slender spikelets, of which one is barren, in a kind of umbel. Highland mountains; flowering in June and July. (Pl. 247, f. 1.)

44. *C. rariflóra* (Loose-flowered Alpine Sedge.)—*Fertile spikelets* two, slender, loose, few-flowered; *bracts* very short and narrow; *fruit* oblong, enfolded in the large blunt glumes. Bogs in the Scottish Highlands, rare, attaining the height of 8—10 inches, and flowering in June. (Pl. 247, f. 2.)

45. *C. limósa* (Mud Sedge).—*Fertile spikelets* 2, ovate, compact; *bracts* narrow, as long as the stalks of the fertile spikelets. Marshes in Scotland and the north of England. Remarkable for its large glumes and narrow long leaves, which nearly equal the stem in height, 10—12 inches. It flowers in June. (Pl. 247, f. 4.)

46. *C. ustuláta* (Scorched Alpine Sedge).—Resembling the last in some of the characters, but growing only a span high, and bearing broad short leaves. Ben Lawers, very rare; flowering in July. (Pl. 247, f. 4.)

***** *Stigmas* 3 ; *fruit smooth ; fertile spikelets stalked, drooping, long.*

47. *C. strigósa* (Loose Pendulous Sedge).—*Bracts* leafy, with long sheaths ; *fertile spikelets* slender, loose, slightly drooping ; *fruit* oblong, tapering ; *leaves* broad. Woods, rare. From $1\frac{1}{2}$—2 feet high ; flowering in May, and June. (Pl. 247, f. 5.)

48. *C. sylvática* (Pendulous Wood Sedge).—*Bracts* leafy, with sheaths not half so long as the stalks ; *fertile spikelets* slender, loose, pendulous ; *fruit* ovate, tapering into a long, cloven, smooth beak. Woods, common ; flowering in May and June. A tufted plant with slender stems, from 1—$1\frac{1}{2}$ feet high, bright green foliage, and loose spikelets, about half the length of the preceding, which are pendulous, on long, very slender stalks. "Linnæus tells us that this plant, when cured and dressed, is employed by the Laplanders to protect their feet from the cold."—*Sir W. J. Hooker.* (Pl. 247, f. 6.)

49. *C. péndula* (Great pendulous Sedge).—*Bracts* leafy, with long sheaths nearly equalling the stalks ; *fertile spikelets* distant, very long, cylindrical. Damp woods and banks of canals. A tall plant 3—5 feet high, with a stem rough at the angles above, well distinguished by its very long pendulous spikelets, which often exceed 3 or 4 inches. It flowers in May and June. (Pl. 247, f. 7.)

50. *C. Pseudo-Cypérus.*—*Bracts* leaf-like, much overtopping the stem ; *fertile spikelets* cylindrical, on long stalks, somewhat crowded towards the top of the stem ; *glumes* bristly ; *fruit* terminating in a very long, spread-

ing, deeply 2-cleft beak. Damp woods, rare. A very handsome and perfectly distinct species, from 2—3 feet high, with rough stems and leaves, and 5 or 6 fertile spikelets about 2 inches long, the fruit of which is so rigid as to be almost prickly. The terminal barren spike is occasionally fertile above. It flowers in June. (Pl. 247, f. 9.)

51. *C. glaúca* (Glaucous Heath Sedge).—*Bracts* leafy, scarcely sheathing; *fertile spikelets* 2 or 3, cylindrical, slightly drooping when in flower; *stalks* long, slender, and finally recurved; *fruit* broadly obovate, blunt, slightly downy at the point. Distinguished by its glaucous leaves (which somewhat resemble those of *C. panícea*), smooth triangular stem, densely flowered spikelets, and blunt fruit. There are often two barren spikelets. It grows, about a foot high, in damp meadows, and flowers in June; common. It was till recently called *C. recúrva*. (Pl. 247, f. 9.)

****** *Stigmas* 3; *fruit downy; fertile spikelets without stalks.*

52. *C. præcox* (Vernal Sedge).—*Fertile spikelets* 1—3, crowded, sessile; *lower bract* leafy, with very short sheaths; *glumes* broadly ovate, pointed; *fruit* ovate, obscurely triangular, acute. A humble plant from 3—8 inches high, common in dry pastures, where it makes itself conspicuous among the grass in early spring by its rather broad foliage and numerous yellow anthers. (Pl. 247, f. 10.)

53. *C. collína.—Fertile spikelets* 1—3, crowded, ovate, sessile; *bracts* short and narrow, with short mem-

branaceous sheaths; *fruit* oblong, very downy. Very rare, having been found only in Monmouthshire, Gloucestershire, and Sussex. It flowers in April and May, and grows from 4—7 inches high. (Pl. 248, f. 1.)

54. *C. pilulífera* (Round Headed Sedge).—*Fertile spikelets* 2—4, crowded, roundish, sessile; *bracts* short and narrow, without sheaths; *glumes* rigid and pointed; *fruit* nearly globose, acute. A common species with a very slender rough stem, bearing near the summit several short spikelets of few flowers; growing in wet moors, where it attains a height of 6—12 inches; flowering in June. (Pl. 248, f. 2.)

******* *Stigmas* 3; *fruit downy; fertile spikelets stalked.*

55. *C. clandestína* (Dwarf Silvery Sedge).—*Fertile spikelets* 1—3, each of about 3 flowers, which are concealed by the large membranaceous bracts. A humble plant from 2—3 inches high; the leaves are narrow and much longer than the stalks. It grows on Salisbury Plain and a few other places; but is rare. It flowers in May. (Pl. 248, f. 3.)

56. *C. digitáta* (Fingered Sedge.)—*Fertile spikelets* 3—4, rather distant, slender, loosely flowered, the upper one longer than the terminal barren spikelet; *bracts* membranaceous, the lower one with a short leafy point. A slender and graceful plant from 8—10 inches high; the spikelets are remarkably lax, but the glumes and fruit are comparatively large. In limestone woods, very rare; flowering in May. (Pl. 248, f. 4.)

57. *C. tomentósa* (Large Downy-fruited Sedge).—*Fertile spikelets* about 2, nearly sessile, short, obtuse, with

6 SLENDER LEAVED C.
C. filiformis.

7 HAIRY C.
C. hirta.

8 SLENDER BEAKED BOTTLE C.
C. ampullacea.

9 SHORT BEAKED BLADDER C.
C. vesicaria.

10 GREATER COMMON C.
C. paludosa.

acute glumes; *fruit* globose, densely downy, with a short beak. Meadows near Merston Measy, Wiltshire; flowering in June. "A well-marked and very rare species, no other station being known for it in Britain than that just mentioned, whence I have an original specimen."—*Sir W. J. Hooker.* (Pl. 248, f. 5.)

vi. *Terminal spikelets barren, 2 or more; the rest fertile. Stigmas* 3.

* *Fruit downy.*

58. *C. filifórmis* (Slender-leaved Sedge).—*Fertile spikelets* 3 or 4, nearly sessile; *bracts* leafy, very narrow, much longer than their spikelets; *glumes* sharp-pointed. Boggy marshes, rare; flowering in May. A slender plant from 1—2 feet high, with long, very narrow, channeled, sheathing leaves; flowering in May. (Pl. 248, f. 6.)

59. *C. hírta* (Hairy Sedge).—Whole plant downy; *fertile spikelets* 2 or 3, remote, erect; *bracts* very long, leaf-like, with long sheaths. Marshes and damp woods, frequent. Much stouter than the last, and easily distinguished by its broad hairy leaves, and spikelets of large downy fruit. It flowers in May and June. (Pl. 248, f. 7.)

** *Fruit smooth.*

60. *C. ampullácea* (Slender-beaked Bottle Sedge).—*Fertile spikelets* 2 or 3, remote, erect, shortly stalked; *bracts* leaf-like, long, without sheaths; *fruit* inflated, beaked; *stem* smooth, with three rounded angles. Bogs and marshes, mostly in the north. Stem and leaves from

1—2 feet high. The leaves are channeled, glaucous, and rough at the edges. It flowers in June. (Pl. 248, f. 8.)

61. *C. vesicária* (Short-spiked Bladder Sedge).—*Fertile spikelets* 2 or 3, slightly drooping, nearly sessile; *bracts* long and leafy, without sheaths; *fruit* much inflated, beaked; *stem* rough, with 3 acute angles. Resembling the last, from which it is distinguished by the above characters, as well as by its broader green foliage, and much larger inflated fruit. Bogs and marshes, not common; flowering in June. (Pl. 248, f. 9.)

62. *C. paludósa* (Lesser Common Sedge).—*Fertile spikelets* cylindrical, slender, obtuse; *glumes* of the barren spike obtuse; *bracts* long and leafy, without sheaths; *fruit* oblong, tapering to a point. A tall plant from 2—3 feet high, with broad keeled leaves, which, as well as the stem, are rough. Common on the banks of rivers and canals; flowering in May. (Pl. 248, f. 10.)

63. *C. ripária* (Great Common Sedge).—*Fertile spikelets* somewhat crowded, broadly cylindrical, tapering to a point which is often barren; *glumes* of the barren spikelet tapering to a long point; *bracts* long and broad, without sheaths; *fruit* oblong, tapering to a point. Taller and stouter than the last, with much broader leaves, which, as well as the stem, are rough. The stem is leafy, and the large dark brown spikelets are crowded towards the summit of the stem. Common on the banks of rivers and canals; flowering in May. (Pl. 248, f. 11.)

Order II. GRAMINEÆ.—GRASSES.

Flowers either with stamens and pistils, or with stamens or pistils only, sometimes neuter, that is, without either stamens or pistils, one, two, or more enclosed in *two* husks or valves, called glumes. In some cases the husk or glume is single; in some it is wholly wanting. The whole collection of flowers forms a spikelet. Each flower usually consists of two dissimilar valvelets called *glumellas*, of which the outer or lower is simple, and generally keeled, often armed with an awn; the inner has two nerves or keels. *Stamens* from 1—6 in number, most frequently 3, often accompanied by 2 or 3 scales surrounding the germen; *anthers* notched at both ends. In the neuter flowers the glumellas are often rudimentary or wanting. *Germen* or *ovary*, 1-celled; *styles* 2, rarely 1 or 3. *Fruit* closely invested by the perianth or seed-vessel. When the spikelets are seated along a common stalk without any partial stalks, the mode of inflorescence is termed a spike, as in the Upright Sea Lyme-grass, Plate 269. When the spikelets all turn one way, it is a one-sided spike, as in the Mat-grass, Plate 250. When the spikelets are arranged on branches, it is a panicle; and this may either be spreading, as in the Quaking-grass, Plate 262, or it may be so close as to be spike-like, and is then a spiked panicle, as in the Vernal-grass, Plate 250; or the spikelets may be on undivided stalks, when it is racemed, as in Heath-grass, Plate 262. The stem of the grasses is often called a culm; it is cylindrical, or nearly so (never triangular), hollow and jointed, the joints becoming more distant at the upper part, with

a leaf at each joint, having a split sheath, and at the summit of the sheath often a membrane called a ligule. The rachis is that part of a stem which runs through the spike or panicle, and bears the flowers. The roots of Grasses are fibrous, the fibres often proceeding from underground stems, which are then called creeping roots; and in some cases Grasses are viviparous, forming buds between the leaf and stem.

* *Stamens* 2; *styles* 2.

1. Anthoxánthum (Vernal-grass).—*Panicle* spiked; *glumes* 2, unequal, the upper longest, 3-nerved; each spikelet having 2 neuter awned florets, and one perfect floret without awns. Name from *anthos*, a flower, and *xanthos*, yellow.

** *Stamens* 3; *style and stigma* 1.

2. Nárdus (Mat-grass).—*Spike* bristly, straight; *spikelets* in two rows without glumes; *glumellas* 2, outer one awned; *stigmas* thread-like, long, and protruding from the summit of the flower. Name from *nardos* of the Greeks, and formerly given to an odoriferous substance, though this grass is scentless.

*** *Stamens usually* 3, *rarely* 1.

† *Styles or stigmas* 2.

3. Leérsia (Cut-grass).—*Panicle* spreading; *spikelets* flattened, keeled, and awnless; *glumes* none; *glumellas* 2, lower one broadest; *stamens* usually 3. Named from John Daniel Leers, a German botanist.

4. Alopecúrus (Fox-tail).—*Panicle* spiked; *glumes* 2, usually connected at the base, about as long as the

floret; *glumella* 1, awned at the back. Name from *alópex*, a fox, and *oura*, a tail.

5. PHÁLARIS (Canary-grass).—*Panicle* spiked or spreading; *glumes* 2, nearly equal, longer than the floret; *glumellas* 2, unequal, awnless. Named from *phalos*, shining.

6. AMMÓPHILA (Sea-reed.)—*Panicle* spiked; *spikelets* laterally flattened; *glumes* nearly equal, keeled; *glumellas* 2, each with a tuft of hairs at the base, outer one with a short awn. Named from *ammos*, sand, and *philos*, a lover.

7. PHLÉUM (Cat's-tail grass).—*Panicle* spiked; *glumes* nearly equal, longer than the floret, tapering to a fine point, or spine-tipped; *glumellas* 2, without awns. Named from *phleos* of the Greeks; this name having probably been applied by them to some other plant.

8. LAGÚRUS (Hare's-tail grass).—*Panicle* spiked; *glumes* 1-flowered, rough, ending in a long bristle; outer *glumella* ending in two long bristles, and a twisted awn. Named from *lagos*, a hare, and *oura*, a tail.

9. MÍLIUM (Millet-grass).—*Panicle* spreading; *spikelets* awnless; *glumellas* 2, nearly equal, and about as long as the glumes. Named from *mille*, a thousand, from its numerous seeds; or from *mil*, a stone, from their hardness.

10. GASTRÍDIUM (Nit-grass).—*Panicle* spiked; *glumes* 2, acute, awnless, swollen at the base: *glumellas* 2, lower one cut off suddenly, or toothed at the end, and with or without an awn. Named from *gastridion*, a little swelling.

11. STÍPA (Feather-grass).—*Panicle* erect; *floret* stalked; *glumes* 2; outer *glumella* terminating in a very

long twisted awn. Named from *stipé*, flax, from its flaxen appearance.

12. Polypógon (Beard-grass).—*Panicle* compact and spike-like; *glumes* 2, equal, longer than the floret, each notched, and with a long straight awn at the end; *glumellas* unequal, the outer usually awned. Named from *polus*, much, and *pogon* beard.

13. Calamagróstis (Small-reed).—*Panicle* loose or compact; *glumes* 2, nearly equal, longer than the floret, which is surrounded at its base by hairs; outer *glumella* usually awned. Named from *cálamos*, one of the Palms, and *agrostis*, a genus of Grasses.

14. Agróstis (Bent-grass).—*Panicle* loose; *glumes* 2, acute, awnless, longer than the florets; *floret* often with tufts of short hairs at the base; *glumellas* 2, unequal, the inner sometimes wanting, the outer with or without an awn. Named from *agros* a field.

15. Catabrósa (Whorl-grass).—*Panicle* spreading; *spikelets* egg-shaped, awnless; *glumes* 2, shorter than the spikelets, very blunt, lower one much the smaller, upper one toothed at the end; *glumellas* 2, nearly equal. Named from *catabrósis*, a gnawing, from the jagged extremity of the glumes.

16. Áira (Hair-grass).—*Panicle* usually loose; *glumes* unequal, about as long as the florets, the outer 1-nerved; *glumellas* hairy at the base, the outer one awned. Named from *airo*, to destroy, anciently applied to the Darnel.

17. Molínia (Molinia).—*Panicle* more or less spreading; *spikelets* long and awnless; *glumes* 2, acute, shorter than the florets, unequal, 1-nerved; *glumellas* 2, outer

one rounded at the back, entire at the end. Named in honour of Molina, a Spanish botanist.

18. Mélica (Melic-grass).—*Panicle* loose; *spikelets* egg-shaped, awnless; *glumes* 2, nearly equal, shorter than the floret; *glumellas* 2, outer one rounded at the back, and entire at the end. Named from *mel*, honey.

19. Hólcus (Soft-grass).—*Panicle* loose; *spikelets* flattened, 2-flowered; *glumes* 2; *glumellas* 2. *Lower floret* with pistils and 3 stamens, its glumellas usually awnless; *upper floret* without pistils and with 3 stamens, with its outer glumella awned. Name *holcos* of the Greeks.

20. Arrhenathérum (Oat-like grass).—*Panicle* loose; *spikelets* flattened; *glumes* 2, nearly equal, as long as the florets; *lower floret* without pistils, but with 3 stamens, and its outer glumella with a long twisted awn. *Upper floret* with pistils and 3 stamens; *outer glumella* with a short bristle. Named from *arrhen*, male, and *ather*, an awn.

21. Hieróchloe (Holy-grass).—*Panicle* loose; *spikelets* 3-flowered; *glumes* 2, nearly equal, about as long as the spikelet; *central floret* with pistils and 2 stamens; *lateral florets* without pistils, and with 3 stamens. Named from *hieros*, sacred, and *chloe*, grass.

22. Koéleria (Koeleria).—*Panicle* spiked; *spikelets* closely tiled all round, and with 2 or more perfect florets; *glumes* 2, somewhat unequal, keeled, and shorter than the florets; *glumellas* 2, outer one acutely pointed, or with a bristle near the end. Named from Köhler, a German botanist.

23. Sesléria (Moor-grass).—*Panicle* spiked, with

spikelets closely arranged round it; *glumes* 2, unequal, nearly as long as the spikelet, with about two perfect flowers; *glumellas* 2, outer one keeled, and jagged at the end. Named after Sesler, an Italian botanist.

24. Pánicum (Panick-grass).—*Spikes* compound, with all the spikelets turning one way, 2-flowered, the lower floret either with stamens only, or without stamens or pistils; *glumes* 2, lower one small, upper one as long as the floret, and spine-tipped; *glumellas* 2. Named from *panis*, bread, the seeds of some species having been used for bread.

25. Setária (Bristle-grass).—*Spike* compound, cylindrical; *spikelets* 2-flowered, surrounded by an involucre of bristles; *lower floret* either with 3 stamens or neuter; *glumellas* of perfect floret 2, lower small, upper as long as the floret, imperfect floret with 1 glumella. Named from *seta*, a bristle.

26. Póa (Meadow-grass).—*Panicle* loose or close, rarely a simple or compound spike; *spikelets* awnless, egg-shaped, or long, narrow, and flattened, with 3 or sometimes 2 perfect florets; *glumes* 2, unequal, and shorter than the florets; *glumellas* 2, outer rather blunt, and rarely tipped with a very small point. Name *Poa*, grass, from *pao*, to feed.

27. Triódia (Heath-grass).—*Panicle* with the spikelets on short, undivided stalks, flat, and 2—3 flowered; *glumes* 2, about as long as the florets; *glumellas* 2, outer one rounded on the back, notched, with a broad point, or awn from between the notches. Named from *treis*, three; and *odous*, a tooth.

28. Bríza (Quaking-grass).—*Panicle* much branched

and loose, with flat egg-shaped spikelets, their florets closely overlapping; *glumes* 2, broad, and much shorter than the spikelet; *glumellas* 2, awnless, outer one blunt, and with a chaffy margin, inner small and flat. Named from *britho*, to tremble.

29. Dáctylis (Cock's-foot grass).—*Panicle* with very crowded spikelets, rather turning one way; *spikelets* many-flowered; *glumes* 2, unequal, shorter than the spikelet, outer one keeled; *glumellas* 2, outer one with a short bristle. Named from *dactylos*, a finger.

30. Cynosúrus (Dog's-tail grass).—*Panicle* spiked, one-sided; *spikelets* each with a stiff involucre of fine segments at its base; *glumes* 2, equal, shorter than the spikelet, and shortly awned; *glumellas* 2, outer one awned, or spine-tipped. Named from *kyon*, a dog, and *oura*, a tail.

31. Festúca (Fescue-grass).—*Panicle* more or less loose; *spikelets* many-flowered; *glumes* 2, unequal, much shorter than the spikelet; *glumellas* 2, outer rounded at the back, taper-pointed or awned at or near the summit; inner with a minute fringe on the ribs; *styles* terminal. Name of uncertain origin.

32. Brómus (Brome-grass).—*Panicle* more or less loose; *spikelets* many-flowered; *glumes* unequal, of the same length as, or shorter than, the innermost florets; *glumellas* 2, outer one rounded on the back, with a long awn from below the tip; *styles* below the summit of the fruit. Named from *broma*, food.

33. Avéna (Oat).—*Panicle* loose; *spikelets* with 2 or more florets; *glumes* 2; *glumellas* 2, hairy at the base, outer one with a long twisted awn, having two

points or bristles at the summit. Name of doubtful origin.

34. Phragmítes (Reed).—*Panicle* loose; *spikelets* many-flowered, the florets all enveloped in long silky hairs, which grow on the rachis of the spikelet; *glumes* 2, unequal, shorter than the floret, the lower much smaller; *glumellas* 2, the lower one with a long point at the end. Name, *phragmites*, an enclosure, from the uses of the reed.

35. Élymus (Lyme-grass).—*Flowers* in a spike; *spikelets* in pairs from the same point of the stem; *glumes* 2, both on one side of the spikelets without awns; *glumellas* 2. Name, from *elymos* of the Greeks.

36. Hórdeum (Barley).—*Spikelets* in threes from the same joint of the raehis, one or two usually with stamens only, or neuter; fertile spikelets with a perfect and a rudimentary neuter floret; *glumes* 2, ending with a long bristle; *glumellas* 2. Origin of name unknown.

37. Tríticum (Wheat, or Wheat-grass).—*Flowers* in a spike; *spikelets* solitary, many-flowered; *glumes* opposite, nearly equal; *glumellas* 2, outer taper-pointed or awned; inner cleft at the point. Name, from *tritum*, beaten, or thrashed.

38. Brachypódium (False Brome-grass).—*Spikelets* solitary, alternate, many-flowered; *glumes* 2, opposite, unequal, shorter than the lowest floret; *glumellas* 2, bristled or awned at the extremity, inner one fringed on the ribs. Distinguished from *Tríticum* by the unequal glumes. Named from *brachus*, short, and *pous*, a foot.

39. Lólium (Darnel).—*Flowers* spiked; *spikelets*

solitary, alternate, with 3 or more perfect florets ; *glumes* 1 or 2, the one next the rachis small ; *glumellas* 2, outer one awnless, or awned. Name, the Lolium of the Romans.

40. Leptúrus (Hard-grass).—*Spike* rounded, separating at the joints; *spikelets* solitary, and imbedded alternately on opposite sides of the rachis, with 1 perfect and 1 neuter floret ; *glumes* 1 or 2, covering the floret ; *glumellas* of the fertile floret 2, and awnless. Named from *leptos*, slender, and *oura*, a tail, from the slender spikes.

41. Knáppia (Knappia).—*Spikelets* solitary, arranged in a somewhat 1-sided raceme, 1-flowered, awnless ; *glumes* 2, opposite, blunt, not keeled, nearly equal ; outer *glumella* hairy, jagged ; inner sometimes wanting. Named after Mr. Knapp, an English botanist.

42. Spartína (Cord-grass).—*Spike* compound; *partial spikes* upright in a raceme, 1-flowered ; *glumes* very unequal, upper taper-pointed; *glumellas* 2, taper-pointed ; *styles* united half-way up ; *stigmas* very long. Named from its similarity to *Lygeum Spartum*.

43. Cýnodon (Dog's-tooth grass).—*Spike* compound; *partial spikes* fingered ; *spikelets* almost without stalks, awnless, arranged in one row on one side of the partial rachis, with one perfect and one neuter floret ; *glumes* 2, spreading ; *glumellas* 2. Named from *kyon*, a dog, and *odous*, a tooth.

44. Digitária (Finger-grass). — *Spikes* compound ; *partial spikes* fingered ; *spikelets* in two rows on one side of a flattened rachis, awnless, with 1 perfect and 1 neuter floret ; *glumes* 2, lower one minute, neuter floret

with one glumella resembling the upper glume. Named from *digitus*, a finger.

1. Anthoxánthum (Vernal-grass).

1. *A. odorátum* (Sweet-scented Vernal-grass). — *Panicle* spiked, oblong; *glumes* about as long as the awns. Perennial. This grass may be known by its early flowering. By the middle of April, while as yet scarcely any grasses are in blossom, the compact panicle of this species may be seen on its slender stem, which is about a foot high, and accompanied by short, flat, rather light green leaves. It is very abundant in meadows, pastures, and on downs, growing often at a great elevation. It is a grass to which our summer hay-field owes much of its fragrance, for though other grasses contribute to this, in some degree, yet hay made from rye-grass, or other sown grasses in which this vernal species is wanting, has not the sweetness yielded so fully by this. Its glumes, as seen beneath the microscope, are copiously furnished with small glands, containing a fragrant essential oil. The scent of this grass is less powerful in its fresh, than in its dried state, but its pleasant flavour, reminding us of highly-scented tea, is perceptible to the taste at all stages of its growth. It grows in any soil or situation, becoming more luxuriant on moist land, and bearing, when growing in marshes, a large panicle. Though its amount of herbage is small, yet its readiness of growth renders it a useful pasture-grass; and its sweetness fits it for pleasure-grounds.

1. SWEET SCENTED VERNAL GRASS.
   Anthoxanthum odoratum.
2. MAT G.
   Nardus stricta.
3. MEADOW FOX TAIL G.
   Alopecurus pratensis.
4. ALPINE F.T.G.
   A. alpinus.
5. SLENDER F.T.G.
   A. agrestis.
6. TUBEROUS F.T.G.
   A. bulbosus.
7. FLOATING F.T.G.
   A. geniculatus.
8. ORANGE SPIKED F.T.G.
   A. fulvus.

Professor Buckman remarks, that it is a most valuable grass to mingle with others, from the flavour which it imparts, but that it is too bitter to be greatly relished by cattle in continual use, and without the admixture of other grasses. Its leaves are apt in dry seasons to be blighted, and to assume an orange tint, and its stems, which do not seem to be eaten by cattle, wither early. The spike is by the middle of June of so bright a yellow as to have suggested the botanic name of the genus. (Plate 249, fig. 1.)

2. Nárdus (Mat-grass).

1. *N. stricta* (Mat-grass).—*Spike* erect, slender; the *spikelets* all pointing one way. Perennial. This is a rigid grass, growing in short tufts, and common everywhere on moors, heaths, and other dry places. It is five or six inches high, and bears in June its one-sided spike of flowers, which is often of a purplish or bronze colour, and armed with minute awns. The stems and leaves are slender, and hard, and too harsh to be much eaten by cattle; the matted tufts which it forms originated its familiar name. (Plate 249, fig. 2.)

3. Leérsia (Cut-grass).

1. *L. oryzoides* (European Cut-grass). — *Panicle* spreading with wavy branches; *spikelets* half-oval, with numerous delicate hairs at the back. Perennial. This rare grass was discovered a few years since by Mr.

Borrer, in ditches, brooks, and wet places, in some parts of Sussex and Hampshire. Its stem is one or two feet high, its leaves are broad and very rough at the edges, and it flowers from August to October. Mr. Babington remarks, "The panicle is rarely, if ever, protruded in this country, but is mostly included in the sheath of the uppermost leaf." It is a very common grass in America, and an exotic species of Cut-grass has its flowers so singularly constructed as to form a vegetable fly-trap to small insects.

4. Alopecúrus (Fox-tail).

1. *A. praténsis* (Meadow Fox-tail). — *Stem* erect, smooth; *panicle* spiked, cylindrical, thick and blunt; *glumes* united at the base, and, as well as the *glumellas*, much fringed with fine hairs; *root* fibrous, and perennial. This tall grass, often two feet high, bears in May and June its yellowish green erect panicle, about two inches long, and covered with silvery hairs. It comes into flower next in succession to the Vernal-grass, and, like it, is very abundant, often constituting the chief part of the herbage of plains and meadows. It becomes most plentiful and luxuriant in marshy lands, where, by its numerous roots, it helps to drain and consolidate the soil. It often grows in salt marshes; and in moist places the base of the stem becomes so enlarged, that if this portion only of the plant were regarded, it might be mistaken for *A. bulbósus*, which, however, has a long slender spike tapering at both ends. It is a

most valuable grass for cattle, coming early, furnishing a large quantity of nutritive herbage, and yielding a better aftermath than almost any other grass. . Its seeds are easily collected, but Mr. Purton remarks, that at least one-third of them are annually destroyed by a minute orange-coloured larva. Professor Buckman, who communicated the result of his experiments on grasses to the *Gardener's Chronicle*, remarks of this, that it might probably be profitably employed as a self-grass, especially in rich low-lands. "In such a situation," says this botanist, "at the foot of Silbury Hill, Wilts, during a visit in the first week in May 1849, an unusually cold Spring, I walked through a field of this grass, which was being folded off by sheep, and a more luxuriant crop or better herbage I never remembered. It also does well where irrigation can be adopted, but it does not succeed well on the uplands. My garden specimens, however, yield an average crop, which endures cutting admirably, and throws up a tolerable second culmiferous and leafy growth." (Plate 249, fig. 3.)

2. *A. alpínus* (Alpine Fox-tail).—*Stem* erect above, slightly procumbent at the base; *panicle* spiked, oval; *awn* short; *upper leaf* short and broad, and its *sheath* swollen and very long; *root* creeping, and perennial. The stem of this grass is nearly a foot high, its leaves are broad and rough at the edges and inner surfaces. The panicle is short and blunt, rarely an inch in length, and very soft and silky, appearing in June and July. It is a mountain grass, growing at an elevation of 2,500—3,500 feet by the sides of streams, and on other marshy spots among the Clova mountains, and

at Loch-na-gar. Sheep eat its leaves, but it is not a valuable pasture-grass. (Plate 249, fig. 4.)

3. *A. agréstis* (Slender Fox-tail).—*Stem* erect, the upper part rough; *panicle* cylindrical, tapering to a point at both ends; *glumes* acute, united below; *glumella* smooth, with an awn more than twice its length; *root* fibrous, and annual. This grass, though considered as scarcely indigenous to Scotland, is common on road-sides in England, and often proves a troublesome weed to the farmer, by coming up early in Spring in wheat, clover, and other fields. John Ray called it Mousetail. It is readily distinguished in June and July by its slender spike, sometimes three inches long. The acute glumes are of a delicate sea-green colour, often tipped with purple. Its slender stem is one or two feet high, the leaves have a tendency to curl, and are frequently of a purplish-green hue. It thrives best on dry soils. Country people call it Black-bent. (Plate 249, fig. 5.)

4. *A. bulbósus* (Tuberous Fox-tail).—*Stem* erect, smooth; *panicle* spike-like, slender, taper-pointed, hairy; *glumes* acute, not united; *awn* twice as long as the glumella. Perennial. This is a rare plant, inhabiting wet salt marshes, and has been found near Yarmouth, and in Wales. The glumes on all the other British species are united at the base, but these, as may be seen by a magnifying glass, are entirely distinct. The stem of this Fox-tail is about a foot high, sometimes prostrate below, and the lowermost knots become large, oval, and fleshy tubers, generally of a rich purple colour. The dense panicle is dark green, about an inch long, and appears in July. (Plate 249, fig. 6.)

5. *A. geniculátus* (Floating Fox-tail).—*Stem* ascending, smooth, bent at the joints; *panicle* cylindrical, blunt; *glumes* united at the base, blunt. *Root* fibrous and slightly hairy; *awn* inserted at the base of the glumella. Perennial. The specific name of this plant points out a ready distinction, for the stem is always kneed, and sometimes the joints are enlarged and fleshy. The stem is about a foot long, branching below, and in July and August is terminated by the sea-green panicle, delicately fringed, and one or two inches in length. The leaves are rather rough on both sides. It is not uncommon in marshy places, and though sometimes found in dry spots, is far more luxuriant in those which combine moisture and shade, where it attains sometimes the height of three feet. Its anthers are of a purplish-yellow colour. It is not a valuable grass to the agriculturist. (Plate 249, fig. 7.)

6. *A. fúlvus* (Orange-spiked Fox-tail).—*Stem* kneed at the joints; *panicle* spiked, cylindrical, blunt; *glumes* united at the base, slightly hairy. Perennial. The spike of this Fox-tail, which is two or three inches long, is conspicuous in July by its large orange-coloured anthers. The plant grows in ponds and ditches, but is local. Its stem is one or two feet in length, and bending below. This is closely allied to *A. geniculátus*, but the awn is much shorter, and the spike is more slender and of a lighter colour. (Plate 249, fig. 8.)

5. Phálaris (Canary-grass).

1. *P. Canariénsis* (Canary-grass).—*Panicle* large, spiked, erect, oval; *glumes* winged on the keel. Annual.

Stray specimens of this handsome grass, naturalized on spots near to fields in which it has been cultivated, may often be gathered both in England and Scotland. We find it among our corn in July, or on some field border, its conspicuous panicle growing on a sea-green stem, one or two feet high, and its leaves lance-shaped, rather long, broad, and soft. It has been cultivated in this country that its seeds may supply food for caged birds, since the time of Queen Elizabeth, and is believed to have been introduced by the emigrants from the Netherlands. Large fields of it may yet be seen in some places, as about Deal, and in the Isle of Thanet, in Kent. The panicle is of a pale straw-colour, the chaffy glumes edged and marked with green, and remarkably keeled at the back. (Plate 250, fig. 1.)

2. *P. arundinácea* (Reed Canary-grass).—*Panicle* erect, with spreading branches; the *spikelets* numerous and crowded in a mass; *glumes* not winged; *root* creeping and perennial. There is a variety of this plant, *variegata*, in which the leaves are striped with pale yellow or white. This grass is, in its general appearance, altogether unlike the last, but is similar in the structure of its florets. Its stem is sometimes five feet high, and its flowers are, in June and July, very conspicuous by river sides, where it is not unfrequent, and where its pale-green or purplish panicle nods to the wind. In its early growth this is close, spreading only when nearly of its full length, which is about six inches. The large roots creep into the soft soil, rendering it firmer, and its broad long flat leaves are slightly rough on both sides. The variegated variety,

the Painted Grass, Ribbon Grass, or Gardeners' Garters, as it is commonly called, is to be found in almost every garden, where it is prized more for its foliage than for its flowers. Parkinson, who wrote his "Garden of Flowers" in the time of Charles II., concluded his work by a description of grasses, and tells his readers that he has led them through his gardens of pleasure, and showed them all the variety nursed therein, and adds: "I shall now, lastly, according to the use of our old ancient Fathers, bring you to rest on the grasse, which yet shall not be without some delight, and that not the least of all the rest." He says of the other grasses, "that they are known only to a few;" and very short is his own list of their number. This old writer, however, remarks of the Painted Grass, "The French call it *Aiguillettes d'Armes*, of the fashion that their ensigne's pennons or streamers used in wars were of, that is like unto a party-coloured curtain." He adds, that in England it is usually called Painted Grass, or Ladies' Laces, and that it had "long ago been respected and cherished in the country gardens of many gentlewomen." It is a favourite grass in Wales, and is often mingled with the Pearly Everlasting, a species of Cudweed, in ornamenting graves. (Plate 250, f. 2.)

6. Ammóphila (Sea-reed).

1. *A. arundinácea* (Common Sea-reed).—*Panicle* close, cylindrical, tapering; *glumes* acute; *hairs* much shorter than the floret; *root* creeping, and perennial. This is the common Marum or Matweed of our sea-shores, and one of the most useful plants on the wide, dreary,

sandy flats so often seen there. It often grows in large masses, its numerous and strong roots, sometimes twenty feet long, serving to hold down those drifting sands, which else might rise in overwhelming heaps to desolate the neighbourhood, and which would prove as injurious as an overflow of ocean itself. Stillingfleet recommended that this grass should be sown on such sandy banks as were without it, and it has been extensively planted in Norfolk, and is carefully grown in Holland. Were it not for this plant and its allies, the Lyme-grass and the rough Sea-sedge, many parts of our coast would be exposed to the most alarming incursions of sand. It is not alone in countries like Egypt, where vast regions of sand prevail, that immense tracts of land have been covered by its inundations. Several instances have occurred in this kingdom of injuries done by them, as in the well-known one of the estate of Coubin, near Forres, in Scotland, where, in 1769, the encroachments of drifting sand had, in one season, completely buried this valuable property, so that only the upper part of an apple-tree was left visible. This calamity was caused entirely by the poor in the neighbourhood having pulled up the grass for household uses. In the reign of Queen Elizabeth an Act was passed to restrain this practice, and commanding that the growth of this Mat-grass should be encouraged. It has been planted in the Hebrides for preventing sand-drift, and its abundant growth on the large sand-bank called Spurn Point, is considered to have been the means of saving the town of Hull from having been washed away by the sea. Spurn Point, originally a drifting sand, has been ren-

dered firm in the course of years by successive growths of this bent; and on this sandy mass the ocean pours the violence of its first swell before it reaches the town. The sand-hills about Calais are held down in a similar way by a plentiful growth of this plant.

This sea-reed is abundant on many loose sandy shores of this kingdom, and on some of those of Kent we have, while looking at it in the morning, thought of the words of one of our oldest poets—

> "And now the dew out of the Ocean's marge
> Began to peepe above the earthy masse,
> With early dew sprinkling the morning grasse."

The stem of this grass is three or four feet high, and its close panicle, tapering at both ends, is, in July, three or four inches in length; the foliage, which is very long, rigid, and of a sea-green tint, has not so bluish a hue as the other useful sand-plant, the Lyme-grass. Its creeping roots have little tubers like beads at the joints. This plant is never found on inland soils, and when by a succession of growths its masses have formed by their tough roots a firmer soil, the grass disappears. It has performed its service in the economy of nature, has bound the once shifting sands, and it gives way to plants of another character. Its coarse hard foliage is not relished by cattle, hence it is not cropped, and its tall, greenish, straw-coloured, stiff stalks rustle to the winds of autumn, unless the poor people in the neighbourhood gather them for weaving into mats, or binding them into ropes for rustic uses. In the Hebrides it is manufactured into mats for pack-saddles, and into vessels for holding grain or meal. It is a source of great regret that in this country there are many hundred thousands of acres of

sea-sand, having all the advantages of climate and of the excellent manure afforded by the refuse of ocean, rendered useless by their want of solidity of soil, and yet too firm for the growth of Mat-grass. Various means have been suggested for rendering these sands useful to the agriculturist, and Dr. Paterson of Glasgow stated to the British Association in 1855, that he had seen a small sheltered corner, of which the soil was no better or other than that of a common sand-hill, which had been reclaimed from waste by the owner, and was then green with the waving produce of clover. In future days, therefore, means may be found of converting these tracts of sand into useful fields. (Plate 250, fig. 3.)

7. Phléum (Cat's-tail grass).

1. *P. praténse* (Common Cat's-tail).—*Panicle* cylindrical; *glumes*, as if cut off at the end, tipped with a spine, and fringed on the keel, longer than the awn; *root* perennial. This is one of the commonest of our meadow plants, growing well on dry poor soils, and retaining its verdure longer than most grasses. It becomes troublesome on dry gravelly soils, by means of its creeping roots, which in some situations become tuberous. This Cat's-tail is in this country used chiefly for hay, being a hard coarse grass, little relished by cows, horses, or sheep, but affording, if made into hay just when ripening its seeds, a fair supply of nutriment. It is in England sown with other grasses, but Professor Buckman says it is admirably adapted for a self-crop, and is one of the most commonly used grasses for this purpose in America, its herbage being in that land much coarser than in ours, and its stems often four feet high,

with flower-spikes four inches long. "In the States of New York and Pennsylvania," says this writer, "I saw hundreds of acres of the best cleared land occupied solely with this grass, of which, indeed, the great bulk of the grass hay of the country is made. Here so strong does it grow as at a slight distance to be capable of being mistaken for a grain crop." The grass grows slowly after cutting, and is late in ripening its seeds, hence its aftermath is not abundant, but its power of resisting drought induces this botanist to infer that it would be a good grass on dry upland or sandy soils. Hares are very fond of its herbage.

This Cat's-tail is from a foot to a foot and a-half high, its leaves rather broad, rough, and furnished with long sheaths, and its panicle, which appears in June, is from two to four inches long, varied with green and white. It owes its common name of Timothy-grass to Mr. Timothy Hanson, who cultivated it extensively in America. (Plate 250, fig. 4.)

2. *P. alpínum* (Alpine Cat's-tail).—*Panicle* egg-shaped, somewhat oblong; *glumes* fringed at the back, cut off suddenly at the end, shortly bristled, sheath of the upper leaf very long and swollen. This rare grass is found on the banks of streams, on Scottish mountains. It has a very short bristly panicle, rarely exceeding an inch in length, of a purplish brown colour, and a creeping knotted perennial root. It varies in the degree in which its leaf-sheath is inflated, as well as in the roughness of its awn. (Plate 250, fig. 5.)

3. *P. ásperum* (Rough Cat's-tail).—*Panicle* cylindrical; *glumes* wedge-shaped, swelling upwards, rough. Annual.

This is a rare grass of dry open fields in some parts of England. Its stem is about a foot high, often branched, and in July its leaves are so long and numerous that they almost cover the flower. The panicle is about two inches long. It has been found in fields about Bristol, and in other parts of Gloucestershire. (Plate 250, fig. 6.)

4. *P. Bæhméri* (Purple-stalked Cat's-tail).—*Panicle* cylindrical; *glumes* narrow, pointed, spine-tipped, and downy at the keel. Perennial. This rare grass grows chiefly on dry sandy or chalky fields in Norfolk and Cambridgeshire. It has a glossy purple unbranched stem, erect, and about a foot high, and but few leaves. It flowers in July. The glumes are purplish. (Plate 250, fig. 7.)

5. *P. Michélii* (Michelian Cat's-tail).—*Panicle* hairy, cylindrical; *glumes* tapering to a point, with a fringed keel. Perennial. This is probably not an indigenous grass. It was stated to be found on the rocky parts of the Clova mountains by Mr. Don, but as it is not found there now, some mistake is supposed to have occurred. (Plate 250, fig. 8.)

6. *P. arenárium* (Sea-side Cat's-tail).—*Panicle* oblong, enlarged at the top; *glumes* tapering to a point, fringed on the keel. Perennial. This is one of our sand grasses, of which we have no fewer than seventeen, all more or less useful in binding the sands. It grows more frequently on the sea-shores of Scotland than England, and though its stem varies in height it is most frequently about half a foot, several stems rising from one root. Its short crowded oblong panicle is of yellowish green, often tinged with a little pinkish colour. It will grow only on

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loose sands, and is there a straw-coloured bright glossy grass in June and July, and, like our sand grasses in general, of no use to the agriculturist. (Plate 250, fig. 9.)

8. Lagúrus (Hare's-tail grass).

1. *L. ovátus* (Ovate Hare's-tail grass).—*Spikes* egg-shaped, with long awns projecting from among the down. Annual. This is a rare grass, inhabiting sandy places in Guernsey, but occasionally planted in tufts in English gardens. It is from four to twelve inches high, with broad leaves and a soft downy panicle of pale greyish colour, slightly tinged with pink. (Plate 251, fig. 1.)

9. Milium (Millet-grass).

1. *M. effúsum* (Spreading Millet-grass).—Branches of the *panicle* long, and in distant tufts, placed alternately on the stem. Perennial. This is a tall slender grass, conspicuous in our moist shady woods, where it is often very abundant, its stem rising to the height of four feet, and its broad smooth leaves of a delicate bright green colour. In June it bears numerous very small light green spikelets, the middle branches of the panicle drooping. It is a very elegant grass, and in winter its tall slender stems and branches, turned to a pale straw-colour, often occupy a large space of ground when flowers have faded away from the wood. The grass is not a nutritious one for cattle, but birds eat the seeds. (Plate 251, fig. 2.)

10. Gastrídium (Nit-grass).

1. *G. lendígerum* (Awned Nit-grass).—*Panicle* spiked; *glumes* tapering to a point, shorter than the awn of the

glumella. Perennial. This little grass, which varies in height from four to eight inches, bears in August a close panicle of numerous pale yellowish green glossy florets, much swollen at the base, and their form affords a ready means of identifying the plant. It is a rare grass, growing in the maritime counties, as Cornwall and the Isle of Wight, generally in places where water has stood during winter. (Plate 251, fig. 3.)

11. Stípa (Feather-grass).

1. *S. pennáta* (Common Feather-grass).—*Awns* very long, fringed throughout their length; *leaves* rigid and bristle-like. Perennial. This is included in our list of British grasses, because it is said to have grown, in the time of Dillenius, on rocks near Kendal in Westmoreland. Most persons are familiar with it as a garden ornament in summer, its long feathery tufts, so like the tail feather of a Bird of Paradise, growing two or three feet high. It forms a beautiful addition to the winter bouquet of "Everlastings," so frequent on mantelpieces, and when soiled with dust will bear cleaning with soap and water, though the long awns are too fragile for a frequent repetition of the process. Gerarde mentions that this grass was in his time worn in the hair instead of feathers; and Parkinson, writing somewhat later, refers to its use as an ornament by ladies, after recent illness. "I have knowne," he says, "that many gentlewomen have used it, being tyed in tufts to set them about their beds, which have been much admired of the ladies and gentlemen that have come to visit them." The grass is a native of dry rocky and sandy spots in the south

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of Europe, and is very common in Austria. It is easy of cultivation, provided that the seeds are sown soon after they are ripe. (Plate 251, fig. 4.)

12. Polypógon (Beard-grass).

1. *P. Monspéliensis* (Annual Beard-grass).—*Panicle* crowded and spike-like; *awns* remarkably long; *glumes* rough and blunt. Annual. This light and elegant grass is found only in a few moist meadows near the sea, in Hampshire, Essex, and some other counties. Its dense silky panicle is, in July and August, beautifully tinted with different shades of green and pale greyish purple, and is one or two inches long, on a stem about a foot high. It has slender hairy leaves, and is a very common grass in southern Europe. (Plate 251, fig. 5.)

2. *P. littorális* (Perennial Beard-grass).—*Glumes* smooth, tapering to a point, and with *awns* about their length. This, too, is a rare grass, occurring in muddy salt marshes, as in those near Woolwich, and on the coast of Essex. Its stem is about a foot high, and it bears in July its close purplish panicle. Its leaves are somewhat broader than those of the last species, and of bright green, and it has a creeping root. (Plate 251, fig. 6.)

13. Calamagróstis (Small-reed).

1. *C. Epigéjos* (Wood Small-reed).—*Panicle* upright; *spikelets* crowded; *glumes* awl-shaped, rough; *awn* of outer *glumella* nearly as long as the glume; *hairs* much longer than the awn. Perennial. This is a handsome,

though rigid plant, with a round erect stem, sometimes five feet high; and narrow acute leaves, hairy on the inner, and smooth on the outer sides. The green one-sided panicle is more or less tinged with brown, with silky hairs, and about half a foot long; flowering in July. This reed is not common, but grows in moist shady woods in some parts of Kent, and about London, as well as in some other places both in England and Scotland. It is far too harsh a grass to be touched by cattle. (Plate 252, fig. 1.)

2. *C. lanceoláta* (Purple-flowered Small-reed).—*Panicle* erect, loose; *glumes* smooth; *awn* short from the notch in the *glumella; hairs* long. Perennial. This grass, with its slender stem three or four feet high, and graceful silky panicle, with an abundance of scattered spikelets, is far more common than the last, and in moist hedges often towers above the bushes, its glossy cluster of flowers being, in June, of a rich purple hue, much smaller, but much prettier in colour than that of the last species. It is somewhat local, but the author has found it in woods near Hythe in Kent, growing to the height of five feet. (Plate 252, fig. 2.)

3. *C. stricta* (Narrow Small-reed).—*Panicle* erect, close; *glumes* acute, rough on the keel; *glumellas* as long as the glumes, longer than the hairs; *awn* straight. Perennial. This reed is the smallest of the species, and has an upright stem two or three feet high; bearing, in June, a close panicle of many spikelets, about three inches long, and tinged with purplish-blue colour. Its leaves are broad and rigid. It is a very rare plant, inhabiting bogs and marshes, and is readily distin-

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guished from the other species by its general appearance, and the colour of its flowering clusters. (Plate 252, fig. 3.)

14. Agróstis (Bent-grass).

1. *A. canína* (Brown Bent-grass).—Branches of the *panicle* long, slender, spreading, when in full flower, and erect; *glumes* unequal, rough at the keel; *glumella* single, toothed, awned from below the middle. Perennial. This is a very abundant grass on boggy meadows, and one often gathered for its delicate beauty. Its glossy stem is one or two feet high, prostrate below; and in June and July its airy clusters, formed of numerous small spikelets on thread-like branches, vary in tint, from pale yellowish-green, to every hue of purple. It generally grows about the moors in little patches, and it has a creeping tufted root, and roughish leaves. (Plate 253, fig. 1.)

2. *A. setácea* (Bristle-leaved Bent-grass).—*Panicle* close, oblong; *branches* and *flower-stalks* rough; *glumes* unequal; outer *glumella* toothed with an awn twice its length. Perennial. This is a plant almost confined, in this country, to downs at the south and south-west of England. It has numerous rigid bright green leaves growing in tufts from the root; and bears, in June and July, numerous oblong panicles with short branches. It is said that no grass is pleasanter to the feet than this, and that the large natural downs which are composed of its turf, in Devonshire, are as neat as the best kept lawns. They need no mower's hand to keep them so; nor, indeed, would these rigid leaves and stems yield to the scythe. On the open downs of Cornwall,

this grass, dwarf furze, and heather, constitute the principal vegetation. (Plate 253, fig. 2.)

3. *A. vulgáris* (Fine Bent-grass).—*Panicle* spreading, its branches almost smooth; *glumes* nearly equal; *glumellas* thin and unequal; *root* creeping and perennial; *spikelets*, in one variety awned, in another awnless. There is also a dwarf variety of this plant, not more than three inches high. This Bent is very common in every part of the kingdom; in meadows and pastures, and by road-sides; at the base of walls, or on other dry spots, often growing in great plenty. Its slender stem is a foot and a half high; and it bears, in June and July, clusters of numerous purplish spikelets, so delicate, and on branches so hair-like, that they quiver in every summer breeze. The small quantity of slender herbage which this grass produces is in perfection by the middle of April, and supplies a good, though slight pasture for cattle. The grass is often called Black Quitch. (Plate 253, fig. 3.)

4. *A. álba* (Marsh Bent-grass).—Branches of the *panicle* spreading when in flower, afterwards compact; *glumes* nearly equal; *stems* erect, but somewhat prostrate at the base; and in the variety called *stolonífera*, rooting, and throwing out long runners. A variety termed *marítima* has trailing stems, rooting at the knots, and a small lobed panicle. This is a perennial, and very common grass, stouter and taller than the preceding, growing abundantly in meadows, on sunny slopes, and by road-sides, being in leaf early in May, or, in forward springs, during April. It is a remarkably fertile plant, producing a large number of suckers; and it affords

1 MARSH BENT GRASS,
Agrostis alba.
2 SPREADING SILKY B. G.,
A. spica venti.
3 DENSE-FLOWERED SILKY B. G.,
A. interrupta.
4 WHORL. G.,
Catabrosa aquat.

an excellent pasture for sheep. The short, flat, narrow, and acute leaves are rough on both sides; and its flowers, which appear in July and August, are sometimes of a paler yellowish-green than those of most of the species, but are quite as often of a purplish colour; the stalk is frequently a foot and a half or two feet high, though few grasses vary more on different soils. (Plate 254, fig. 1.)

5. *A. Spica-venti* (Spreading Silky Bent).—*Panicle* loosely spreading; *glumes* unequal; *awn* straight, very stiff, and three or four times the length of the glumella. Annual. Slender and delicate as are all the species of *Agrostis*, and remarkable for their small spikelets, yet none are graceful and airy like this. The light and elegant panicle is often six inches long, and of pale green, but sometimes of pinkish hue, leaning on one side, and glossy as satin, nodding to every breath of the midsummer wind which sweeps across the sandy fields where it grows. Its rough and slender awns are many times as long as the spikelet. It is a rare grass, and found chiefly in the neighbourhood of London. On spots occasionally inundated it becomes very luxuriant, its stem rising to the height of three feet, though, usually, about one or two feet only. Its long awns would prevent its being mistaken for any other grass except the following. The inner glumella contains a small neuter floret, with a tuft of hairs at its base. (Plate 254, fig. 2.)

6. *A. interrupta* (Dense-flowered Silky Bent).—*Panicle* close, long, slender; *glumes* unequal; *glumellas* with straight long awns. Annual. This grass differs

from the last in its close, never-spreading panicle; and in the more rounded form of its anthers; but it resembles it in structure in other respects. It flowers in July, and its stem is rarely more than half a foot in height. (Plate 254, fig. 3.)

15. Catabrósa (Whorl-grass).

1. *C. aquática* (Water Whorl-grass).—*Panicle* with half whorls of spreading branches; spikelets usually with two, sometimes 3—5 florets; *glumes* thin and blunt; *glumellas* thick, white, and clear at the extremity. Perennial. This is an aquatic grass, sometimes floating to a great length in the water, at others, growing on wet banks, when it becomes much smaller, and has a stem but a few inches high. The panicle of this Whorl-grass is composed of a large number of small spikelets, bluish, or often brownish green, on very slender branchlets; the stem is stout, and one or two feet long, bending at the base, and sending out roots. The leaves are broad, blunt, and bright green; and the flowers, which appear in May and June, have a sweet flavour; the whole plant having more or less of a sweetish taste. Water-fowls are fond of its young leaves and shoots, while cattle relish it so much, that were the grass not an aquatic, it would doubtless be cultivated for their pasturage. It is said to contribute to the excellence of the Cambridge butter and the Cottenham cheese. Curtis remarks of it, that no less than five species of flies (*muscæ*) were produced from a few handfuls of its seeds, among which they had, no doubt, hybernated in the chrysalis state. (Plate 254, fig. 4.)

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16. Áira (Hair-grass).

1. *A. cæspitósa* (Tufted Hair-grass).—*Panicle* spreading, branches rough; *glumes* slightly rough at the midrib; *awn* inserted near the base of the outer glumella, and scarcely extending beyond its summit. There is a variety of this grass, *brevifolia*, with short leaves and smaller panicle; and another with longer awns, termed *longi aristata*. This is a common and very pretty grass, with a perennial root; and it is found in abundance on field-borders, and especially on moist moory ground, where it flowers, in June and July, among Spearworts and other marsh flowers, and thick green mosses. On such spots, especially if shaded by furze and brambles, it attains great luxuriance; but when the land is drained, it soon disappears; and when we see it, as we often do, growing with the different species of Sedge (Carex), and with the roughish Meadow-grass, we have sure indication that the land is not in good condition. It is commonly known in country places by the name of Hassock or Tussack-grass; and its large matted tufts cause those clumps called tussacks, which the mower finds so great a hindrance to his scythe. It is also termed Rough-caps, from its long, narrow, rough, twisting leaves, which are marked with fine lines. Bull-faces and Silver-grass are also among its familiar names.

This Hair-grass has a strong stiff stem, two or three feet high, and its light and graceful panicle is of a dull metallic hue, but when glistening in the midsummer sunshine, its numerous small spikelets look as if cut out of silver. It is a hard rigid grass, and is refused by

horses, while cows will only eat it when compelled by hunger. (Pl. 255, fig. 1.)

2. *A. alpina* (Smooth Alpine Hair-grass).—*Panicle* close; *glumes* smooth on the midrib; *awn* from about the middle of the glumella, and scarcely longer than the glumes. Perennial. This, which is usually a viviparous grass, grows abundantly on the mountains of Scotland and Wales, on moist rocks. It has a glossy stem, a foot or a foot and a half high, its leaves are rough within and smooth on the outer surface, and often turning backwards. The panicle, which appears in June and July, is very light, slightly drooping, and composed of numerous pale brown shining spikelets, on nearly erect branches. (Pl. 255, fig. 2.)

3. *A. flexuósa* (Wavy Hair-grass).—*Panicle* spreading, with wavy branches; *awn* inserted near the base of the glumella, and extending far beyond it; *florets* hairy at the base, as long as the glumes. Perennial. This grass has a slender erect smooth stem, a foot or a foot and a half high, and bears, in July, a pale greenish-brown, glossy, erect panicle. The spikelets are much larger than in the preceding species, and the wavy angular branches are not thicker than the most delicate sewing-thread. It grows abundantly on hill sides and heathy places, and has long, slender, bristle-like leaves. (Pl. 255, fig. 3.)

4. *A. canéscens* (Grey Hair-grass).—*Panicle* long and crowded; *glumes* taper-pointed, longer than the florets; *awn* short, club-shaped, from near the base of the glumella. Perennial. The tufted stem of this grass is six or eight inches high, and bears, in July, a panicle of numerous spikelets, variegated with purple, green, and

1. GREY HAIR GRASS, *Aira canescens.*
2. SILVERY H. G., *A. caryophyllea.*
3. EARLY H. G., *A. præcox.*
4. PURPLE MOLINEA, *Molinea cærulea.*
5. MOUNTAIN MELIC GRASS, *Melica nutans.*
6. WOOD M. G., *M. uniflora.*

white, the awns being purplish-white, and the anthers purple. Its leaves are numerous and bristle-like. It is a very rare grass, found on the sandy sea-coasts of Dorset, Norfolk, and Suffolk, and has also been gathered from the chalk between Folkestone and Dover, in Kent. (Pl. 256, fig. 1.)

5. *A. caryophýllea* (Silvery Hair-grass).—*Panicle* spreading, three-forked; *spikelets* blunt at the base; *glumes* nearly equal, rounded at the base, the upper part clear and white; *awn* longer than the glumes; outer *glumella* deeply cleft. Perennial. This is a frequent grass on gravelly heaths and pastures, its stem sometimes not more than two or three inches, and rarely a foot high. It has a few short bristle-like leaves at its root, and several small rough ones on its stem. It flowers in June and July. Its panicle is of a silvery grey colour, and the spikelets are very small. (Pl. 256, fig. 2.)

6. *A. præcox* (Early Hair-grass).—*Panicle* spike-like, oblong; *awn* much longer than the cleft glumella, and from below its middle. Annual. This little grass, inhabiting sandy hills and pastures, is rarely more than three or four inches high. Its panicle, which appears in May and June, is very small, erect, and close, and has few spikelets, often not more than a dozen. They are yellowish or purplish green, somewhat tinged with silver colour, but less so than most of the species, and they are rather pointed at the lower end. The florets have scarcely any hairs at the base. The leaves are few, slender, and bristle-like. In dry seasons it withers very early. (Pl. 256, fig. 3.)

17. Molínia (Molinia).

1. *M. cœrúlea* (Purple Molinia).—*Panicle* erect, narrow; *spikelets* erect, oblong, narrow; *floret* much longer than the *glume*. Perennial. This grass flowers in August and September, later than almost any other, and is common on heaths and moory grounds. Its stem is usually one or two feet high, and has a single joint near its base, but grows much taller when sheltered by the furze-bushes or ling of the moist moor. The panicle is of a much deeper hue than any other of our native grasses; for although a variety found at a great elevation on the Clova mountains, and called *depauperata*, has numerous, pale green, one-flowered spikelets, yet our grass has usually a tint as deep as that of the myrtle leaf, with a dark tinge of bluish-purple spread over it, and large purple anthers. Its spikelets are small but numerous, two or three flowered, and the panicle is from three to six inches long, with numerous waved branches. The leaves grow either from the root, or rise from the knot at the lower part of the stem, and are long, slender, and taper-pointed. The long straws of this grass are said by Withering to be made, in country places, into carpet-brushes, and twisted together they form a durable line used by fishermen. The root has large thick fibres. (Pl. 256, fig. 4.)

18. Mélica (Melic-grass).

1. *M. nútans* (Mountain Melic-grass). — *Panicle* almost a raceme; its *spikelets* large, hanging on short stalks, which are rarely branched, from one side of the

stem, oval, and with two perfect flowers; *glumes* oval; *glumellas* unequal. Perennial. This grass has many long, thin, bright shining leaves, and a stem about a foot high. Its flowers appear in May and June; their glumes are of a purplish-brown colour, with a white margin. It is found in shady places and woods in hilly and mountainous countries, and is frequent in the neighbourhood of Malvern. Cattle do not relish it. (Pl. 256, fig. 5.)

2. *M. uniflóra* (Wood Melic-grass). — *Panicle* branched, slightly drooping; *spikelets* erect, oval, and with only one perfect floret; *root* creeping and perennial. This is one of our most common vernal grasses, nodding to the breeze of May, beside the primroses and blue-bells. It is very abundant in some woods; and its large spikelets standing on a slender stem, a foot or more high, and each on a hair-like stalk, would hardly fail to be noticed by any lover of flowers. The spikelets are few, and distant from each other, erect, and of a purplish-brown hue, variegated with white and green. Cattle relish the soft, drooping, bright green leaves, which are marked on both sides with lines. It flowers early in summer, but the glumes retain their form long after the seed is shed. (Pl. 256, fig. 6.)

19. Hólcus (Soft-grass).

1. *H. móllis* (Creeping Soft-grass).—*Panicle* loose; *glumes* tapering to a point; *awn* rough; joints of the *stem* hairy. Perennial. This grass, owing to its long, creeping, knotted root, is very difficult of extirpation, and when it grows, as it often does, in corn-fields, it is

very troublesome. Mr. Loudon remarks of it, that it is the true couch-grass of light sandy soils; and long runners, which were but the result of a few months' growth, have been found extending themselves five feet beneath the surface of the soil. It grows in uncultivated fields and thickets, and is very common by road sides, but is rarely a meadow-grass. It bears, in July, a light and elegant erect panicle, of numerous small spikelets, which is much like that of the next species, but not so ornamental, being rarely tinged with pink, and mostly of a dull greenish-white hue. Its stem is from one to three feet high; its leaves lance-shaped, rather broad, and light green; and the knots of its stem usually woolly. The root shoots are very nutritious, and when taken up are readily eaten by cattle; but the dry, soft, insipid herbage is little relished by them. (Pl. 257, fig. 1.)

2. *H. lanátus* (Meadow Soft-grass).—*Panicle* loose; *glumes* rather blunt, spine-tipped; *awn* smooth, except near the extremity. Perennial. We have only to walk abroad during June and July into the wide-spread meadow lands, and we shall be sure to see this grass. It grows on all soils, from the richest to the poorest, but its prevalence always indicates a poor and moist meadow. Its beautiful soft panicle, composed of innumerable small spikelets, crowded together, tinged with pink, often deepened into rich pinkish-purple, is large and conspicuous, though its brightness disappears as the grass gets older. It then, if abundant, whitens the pasture, so as to deserve its old name of Yorkshire Whites, or even of Yorkshire Fog. It is not unlikely,

however, that it owes its latter name to its softness, which led to its comparison with moss, for which fog was an olden name, and by which it is yet called by North country people, who allude to moss in their familiar proverb :—

"The ro'ing stane gathers nae fog."

Our Meadow Soft-grass is one or two feet high, and has a fibrous root. Curtis says of it, that when it is in flower the farmer thinks his grass-land fit for the scythe. The herbage, as well as the flowers, is covered with soft down. It is not sufficiently succulent to be liked by cattle, and both leaves and flowers often remain untouched on meads when other grasses have been cropped all around them. Its nutritious properties are said to consist of mucilage and sugar; but it would appear that the properties most relished by our herbivorous animals are either sub-acid or saline. (Pl. 257, fig. 2.)

20. Arrhenathérum (Oat-like grass).

1. *A. avenáceum* (Common Oat-like grass).—*Panicle* long and loose; *root* fibrous and perennial. A variety of this grass, *bulbósum*, has a swollen or tuberous base to the stem, and is commonly called Onion Couch. The Oat-like grass is, during June and July, a tall conspicuous plant; its panicle, composed of rather large spikelets on slender branches, is often a foot and a half long, of a bright brown, or so tinted with shades of green and lilac as to shine in the sunshine as if with metallic lustre. This grass is sometimes five or six feet in height, and it is as common as it is beautiful, for it nods in the hedge or woodland by the briar-roses, or

overtops the corn, or glistens in the meadow just ready for the scythe. Wherever it grows in abundance we may infer that the soil is poor, and it is most likely to be either of a clayey or light sandy nature, as this plant does not prevail on stiff rich soils. The bulbous variety, the Onion Couch, forms little strings of knobs, like small onions, at the base of its stem, and is so troublesome in corn-fields that when abundant it is often dug up and burned. Professor Buckman remarks of it, that it is a pest on such lands as are frequently to be met with in some parts of Worcestershire, which is mostly made up of disintegrated slabs of new red sandstone; or again at Cheltenham, where are thick beds of ancient marine sands, filling up hollows in the lias. In the latter, which is much used for garden ground, for which it is peculiarly adapted, the Onion Couch has to be picked out in digging with great care, otherwise the evil is continued, as the smallest portion left behind grows with great rapidity.

The stem of the Oat-grass is round and shining; its leaves are lance-shaped, narrow, pointed, and rather hairy. The herbage has a bitter unpleasant flavour, and it is this bitterness probably which makes it unpalatable to cattle, otherwise it would be a valuable pasture grass, both on account of the early growth of its foliage and the large supply which it yields. (Pl. 257, fig. 3.)

21. Hierochloe (Holy-grass).

1. *H. boreális* (Northern Holy-grass). — *Panicle* straggling; stalks of the *spikelets* smooth; *glumes* egg-shaped, unequal; *florets* awnless; *root* creeping and

1 BLUE MOOR GRASS
Sesleria coerulea

2 LOOSE PANICK G
Panicum crus galli

3 ROUGH BRISTLE G
Setaria verticil

4 GREEN B G
viridis

perennial. This grass has a thick stem, a foot or a foot and a half high. Its panicle is composed of rather large purplish-brown spikelets, with very conspicuous pale brown anthers. It is an extremely rare grass, and is not considered as a truly British plant; for though found in a narrow mountain valley by Mr. Don in Angusshire, it no longer grows there. Its scent is sweet, like that of our Vernal-grass, and it takes its English familiar name from the uses to which it is applied in some parts of the Prussian dominions, where the plant is dedicated to the Virgin Mary, and strewed in the aisles of churches and around the doorways on festival days. It grows in abundance in Iceland, and there, as in other parts of Northern Europe, it is laid in bundles among linen, or hung up in rooms, for its fragrance. Its odour is also believed to cause sleep, and in Sweden it is sold in bundles for these uses. (Pl. 257, fig. 4.)

22. Koelèria (Koeleria).

1. *K. cristáta* (Crested Koeleria).—*Panicle* compact and spike-like, interrupted below; *glumes* flattened, acute; inner *glumellas* white and thin. Perennial. This rare, or rather local plant, grows in dry pastures near the sea, mostly in the north. Its downy stem varies from a foot to a foot and a half in height; its leaves are rough, and fringed on the edges. It flowers in June and July, and its spikelets vary as to downiness, being sometimes quite smooth, and of a greenish silvery hue. (Pl. 257, fig. 5.)

23. Sesléria (Moor-grass).

1. *S. cœrúlea* (Blue Moor-grass). — *Panicle* oval,

slightly one-sided; outer *glumella* jagged, and with a short point. Perennial. This is a very beautiful early flowering grass, bearing its short greyish-green cluster from March to June. This changes as it grows older into a purplish-blue colour, and its large anthers are of a deep purple hue. In continental countries both flowers and foliage are of a deeper and more decided blue than on our mountains. The stem of the Moor-grass is from six to eighteen inches high, and its leaves are rather blunt, with a minute point, and rough on the keel and edges. It is most abundant in limestone districts in the north of England, and grows also on the banks of the Shannon. (Pl. 258, fig. 1.)

24. Pánicum (Paniek-grass).

1. *P. Crus-galli* (Loose Paniek-grass).—*Spikes* alternate or opposite; *glumes* 2, lower small; upper *glume* and barren *floret* awned, or tipped with a short, rough spine. Annual. This is a coarse grass, not truly wild, but naturalized in moist fields about London. The spikelets are near together, and at the base of each are two or three long bristles. The leaves are broad, harsh, tinged with purple, and the seeds are very large. It flowers in July. (Pl. 258, fig. 2.)

25. Setária (Bristle-grass).

1. *S. verticillata* (Rough Bristle-grass). — *Panicle* spike-like; bristles of the *involucre* rough, with erect teeth; *glumellas* smooth, very hard and firm. Annual. This is a naturalized grass, very local, and rarely plentiful

1 REED MEADOW GRASS
Poa aquatica

2 FLOATING M. G.
P. fluitans

3 CREEPING SEA M. G.
P. maritima

4 BELLENER M. G.
P. distans

5 BORRERIS SEA M. G.
P. borrera

6 PROCUMBENT S. M. G.
P. procumbens

on any spot. It has been found about London and Norwich, in cultivated fields, and bears in June and July its pale green, or pinkish, or deeper purple flowers. (Pl. 258, fig. 3.)

2. *S. víridis* (Green Bristle-grass).—*Panicle* spike-like; bristles of the *involucre* rough, with teeth which turn downwards; *glumellas* smooth. Perennial. The crowded spikelets of this grass, with long, rough bristles at their base, are usually green, though occasionally tinged with purple. It flowers in July and August, growing in sandy fields about London and Norwich, but is not a true native of Britain. (Pl. 258, fig. 4.)

3. *S. glaúca* (Glaucous Bristle-grass).—*Panicle* spike-like; *bristles* with erect teeth; *glumellas* wrinkled. Annual. This species is distinguished chiefly by the wrinkled glumellas. It has long, slender leaves, hairy at the base, and its bristles are numerous and rigid. It flowers in October, and is a naturalized plant; found at Weybridge in Surrey, and at Hoddesdon in Hertfordshire.

26. Póa (Meadow-grass).

1. *P. aquática* (Reed Meadow-grass).—*Panicle* erect, much branched; *glumes* small, egg-shaped, thin; outer *glumellas* much larger than the glumes; *spikelets* many-flowered, erect, awnless. Perennial. The margins of our rivers, lakes, and standing waters have their grassy borders, among whose herbage grow some of the brightest of our wild flowers. One of the tallest and most plentiful of the grasses by the river is this Reed Meadow-grass, which grows either by the side of flowing or

standing waters in great abundance. It might serve by its height to remind us of the grasses of warmer climates, for its stout stem is occasionally, in favourable situations, six feet high. It is a native of most parts of Europe, and abounds in the fens of Lincolnshire and Cambridgeshire, where it is sometimes cut down three times in a year, forming not only a rich pasturage all the summer, but constituting a large portion of the winter fodder for animals. It grows not only on the moist lands watered by rivers, but in the water itself, and may be seen rising above the elegant leaves of the Arrow-head, and the broad foliage and rose-coloured flowers of the Water Plantain, and waving about like a plume far above the surface of the stream. Owing to the rapid growth of this, as, indeed, of most aquatic plants, it soon fills up the standing pools, and even when the water of the river runs but slowly it gains ground very quickly, sending out its powerful creeping roots, and taking firm hold of the soil. On this account it sometimes proves a formidable impediment to the drainage of moist districts. Curtis says of it that the waters in the Isle of Ely become so encroached upon by this and other aquatics that they are obliged to be cleansed by an instrument called a bear, which being drawn up and down the streams tears up the water plants by their roots.

The large, repeatedly branched panicle of this grass is, during July and August, composed of a great number of brownish-green spikelets; the slender branches of the panicle are rough, the leaves are long, broad, and of a bright green colour, taper-pointed, and smooth. The

plant when dry is used by country people in packing goods, and also mingles with the stems of other large grasses and sedges in the thatch of the barn or cottage. (Pl. 259, fig. 1.)

2. *P. flúitans* (Floating Meadow-grass).—*Panicle* nearly erect, very long, and slightly branched; *spikelets* long, slender, roundish, but slightly flattened, with many florets; outer *glumella* very long, with seven prominent ribs and a central point; *root* creeping and perennial. This thick, succulent grass often grows abundantly in ditches and stagnant waters, its stem rising to the height of three feet, with long, narrow, pale green leaves, rough on both sides, often folded at the keel. The nearly erect panicle expands in July and August, and we have seen it lingering yet amidst the November gales. It is long and slender, with slightly roughish branches, arranged usually in twos and threes. The spikelets are varied with pale delicate green and white, and have purplish anthers, and are sometimes on short, undivided stalks. The seeds of this plant are large, but in this country are not plentifully produced. They are almost as nutritive as grains of wheat, and are in some countries used as food. These seeds constitute the *manna-seeds* of commerce, and in Holland, as well as in some parts of Poland and Germany, they are gathered in great quantities, and used for food. De Theis remarked, that he had seen the Polanders in the suite of King Stanislaus gather these manna-seeds on the banks of the Meurtha. It is abundant in Germany, on the margin of standing waters, as well as on very wet meadows; and Meyen observes of it, that "round

Berlin, where the plant grows singly, no one thinks of the well-tasted seeds which it bears; but further east, in East Prussia, Masuria, and the Lower Vistula, it grows in such quantities that the seeds are gathered with great profit, without the plants having been previously sown." Several fine kinds of groats for gruel are made of these seeds, and they are sold in shops under the name of Manna-seed. The grains are eagerly eaten not only by waterfowl and other birds, but also by fish, especially the trout. The long narrow leaves, too, which lie floating on the surface of the water, form a sweet herbage for horses and cattle; and the cows may be seen on a summer or even a winter day going far into the pool to crop it, for it is green and nutritious and plentiful, even at the season when herbage is scarce. (Pl. 259, fig. 2.)

3. *P. marítima* (Creeping Sea Meadow-grass).—*Panicle* erect, with its lower branches in pairs, or with spikelets on simple stalks; *spikelets* flattened, narrow; *glumes* taper-pointed; outer *glumella* firm and of purplish colour; *root* throwing out runners, and perennial. This is a short grass, varying in height from half a foot to a foot, and bearing, in July and August, a firm, rigid cluster. It is often of a sea-green colour, the flowers tinged with purple, and the leaves generally folded, compressed, and pungent. It is a common sea-side plant, growing mostly in marshes, or on the grassy banks of sea-walls, as on those of Dimchurch in Kent, and also on the borders of the River Medway in the same county; and is often so covered up with mud that one wonders how it can thrive at all. It occasionally

grows in drier places, as at the base of the chalk cliffs near Dover. (Pl. 259, fig. 3.)

4. *P. dístans* (Reflexed Meadow-grass).—*Panicle* spreading; *branches* finally turning downwards, lower mostly in fours or fives; *spikelets* narrow and small, of 3—6 florets; *glumes* short, unequal. Perennial. The round slender stem of this grass is often a foot and a half high, generally prostrate at the base, and the panicle, which appears in July and August, is light and graceful, with numerous rather small spikelets, on branches which are rough to the touch, and which bend downwards in the manner which characterises this species. Its leaves are smooth, flat, and unfolded. It is nearly allied to the last species, and is equally rigid, but the reflexed branches and smaller spikelets, as well as the tasteless leaves, distinguish it. In *P. marítima* the lower branches are always erect. It is also usually taller and more slender than that plant. It grows on sandy sea-shores, and has fibrous roots without runners, and usually few leaves. It is rather a local grass, generally found on sandy pastures on the coast. Sometimes, however, it grows on the borders of brackish rivers, as on the muddy shores of the Avon, near Clifton, where it flourishes in great abundance, and is the companion of the Creeping Meadow-grass and of the Sea Procumbent Meadow-grass, (Pl. 259, fig. 4.)

5. *P. Borréri* (Borrer's Sea Meadow-grass).—*Panicle* spreading; *branches* short, lowermost ones generally in fours, often standing out horizontally from the stem, but when in fruit always erect; *spikelets* small and of 4—7 florets, narrow; outer *glumella* blunt, with a minute

point; *root* tufted and perennial. This grass is often found growing with the last two species in salt marshes, especially on the south-eastern coast. Its leaves are short and flat, and remarkable for their long sheaths. Its panicle appears in July, and the spikelets are very much smaller than in the two preceding grasses, and the branches fewer. The stem is about a foot high. It is a local but not rare grass. (Pl. 259, fig. 5.)

6. *P. procúmbens* (Procumbent Sea Meadow-grass).—*Panicle* compact, scarcely branched except at the lower part; *branches* upright, rigid, and never bending; *spikelets* narrowly lance-shaped, of about four florets; *glumes* small, blunt, strongly ribbed; *root* fibrous and annual. This is a not unfrequent grass on the maritime shores of England, though rare in Scotland and Ireland. The stem, which is round and smooth, always bends more or less at the base, and is from half a foot to a foot long, bearing, in June and July, its compact cluster, about two inches long, of small grass-green spikelets, turning all one way on their branches, which stand in two rows on the stem. Mr. Knapp remarks of this grass, that at Hartlepool, where seaweeds were burnt in order to obtain an alkaline salt for the alum works at Whitby, after showers of rain an alkaline lixivium floated in the yard from the stacks of sea-weed, destroying all vegetation; yet that this grass, though not frequent in the neighbourhood, luxuriated there abundantly. (Pl. 259, fig. 6.)

7. *P. rígida* (Hard Meadow-grass).—*Panicle* compact, erect, rigid, with branches in two rows, the *branches* being sometimes undivided so as to be a raceme; *spike-*

1 HARD MEADOW GRASS
Poa rigida.

2 DWARF WHEAT M. G.
P lolnacea.

3 FLAT STEMMED M. G.
P compressa

4 SMOOTH STALKED M. G.
P pratensis

5 ROUGHISH M. G.
P trivialis.

lets small and narrow, of 7—10 florets; *glumes* unequal and acute; *roots* fibrous and annual. This little wiry hard grass, with its rigid cluster one or two inches long, is common in June, on dry heaths, old walls, and rocks near the sea. The branches of the panicle are short and rough, or sometimes almost wanting; the spikelets growing close to the stem on very short stalks. The wiry erect stem is rarely more than five inches high, and the leaves very narrow, flat, and tapering at the point. The root takes very little hold of the soil. (Pl. 260, fig. 1.)

8. *P. loliácea* (Dwarf Wheat Meadow-grass).—*Panicle* racemose, rigid, usually one-sided, very rarely branched; *spikelets* narrow and oblong, of about 8—12 florets; *glumes* blunt, nearly equal; *root* annual. This grass is much like *P. rígida*, equally stiff and wiry, and of about the same height. The spikelets are mostly arranged down the main stem on alternate, short, stout foot-stalks, more or less distant, each stalk bearing one spikelet, and all turning one way. It flowers in June, and grows on sandy soils and on rocks, but is not, like the last species, a common plant. Its stem is stout and slightly curved. (Pl. 260, fig. 2.)

9. *P. compréssa* (Flat-stemmed Meadow-grass).—*Panicle* rather one-sided and close, but spreading when in flower; *spikelets* oblong or somewhat egg-shaped, of 5—7 blunt florets; *root* creeping, with long runners, and perennial. There are two varieties of this grass; one having three silky nerves on the outer glumella, and its florets connected by a web; and another in which the nerves are five in number, and the florets free. This Meadow-grass is readily distinguished by its flat stem,

is much branched, and flowers at midsummer; the leaves are taper-pointed. (Pl. 260, fig. 5.)

12. *P. bulbósa* (Bulbous Meadow-grass).—*Panicle* close, erect; *spikelets* egg-shaped, with four florets, which are silky at the keel and connected by a web; *root* perennial. This is a very distinct species, having a white serrated edge to its leaves, and a stem which swells at the base, so as to resemble a bulb. It is an early grass, growing chiefly on the sandy sea-shores, bearing its spike-like cluster on a stem about a foot high, and flowering in April. It has scarcely expanded before it begins to wither away, and its bulb-like knots lie drifting about on the sand all the summer and autumn till they finally fix themselves into the soil. It is found chiefly on the east and south-east shores of England. (Pl. 261, fig. 1.)

13. *P. alpína* (Alpine Meadow-grass).—*Panicle* erect, spreading when in flower; *spikelets* oval, of four or five florets; outer *glumella* silky at the keel, and of a beautiful deep purplish red, with a clear margin; *root* perennial, fibrous, and tufted. In a variety, *glomeráta*, the panicle is densely crowded. This grass is extremely abundant in the lofty mountains of England and Wales, and, like the greater number of grasses growing on elevated positions, is viviparous, forming buds between the stem and leaves. Its stem is from six to twelve inches high. Its panicle flowers in July and August, is somewhat drooping, the spikelets large and of a fine red colour, and the leaves are short, blunt, and tipped with a minute spine. (Pl. 261, fig. 2.)

14. *P. láxa* (Wavy Meadow-grass).—*Panicle* loose,

1 BULBOUS MEADOW GRASS,
Poa bulbosa.

2 ALPINE M G,
P alpina

3 WAVY M G,
P laxa

4 WOOD M G,
P nemoralis.

5 ANNUAL M G,
P annua

slightly nodding; *spikelets* egg-shaped, of three or four florets; *florets* either connected by a web or free; outer *glumellas* silky at the keel; *root* fibrous. This is a mountain-grass, and grows on Ben Nevis and Loch-na-Gar. It is slender, of a rather pale green, with a stem from six to twelve inches high, flowering in July and August, and bearing broad greenish purple spikelets. It is often viviparous. (Pl. 261, fig. 3.)

15. *P. nemorális* (Wood Meadow-grass).—*Panicle* loose, slender, slightly leaning to one side; *spikelets* egg-shaped, of from three to five florets, which are silky at the keel; *root* perennial. Of this plant there are many varieties. Their characteristic differences consist in the length of the uppermost sheath of the leaf, the shape of the ligule, and the circumstance of the florets being either connected with a web, or free. Some of the varieties are so marked and constant that many botanists have considered their characteristics as permanent, and describe them as distinct species. Such are the *P. cæsia*, which has an erect slender panicle, of a most beautiful blue colour, the foliage of which is more or less glaucous; the *P. Parnellii*, a mountain-grass, which grows in upper Teesdale, and which is an elegant, very slender, pale green plant; as well as *P. Balfourii* and several others; but Drs. Hooker and Arnott do not consider the distinctive marks as constant. The Wood Meadow-grass is the only species of the genus which does not grow wild on open pasture-lands. It is very common in our woods and thickets, and is a delicate, upright grass, with many leaves in early spring, flowering in July and August, and with a stem one or two

feet high. It has not been much grown on open pasture-lands, but it yields a fair amount of tender and delicate herbage, which cattle seem to relish in the autumn. It is a late-growing grass, and affords more herbage at that season than in the earlier part of the year. (Pl. 261, fig. 4.)

16. *P. ánnua* (Annual Meadow-grass).—*Panicle* somewhat triangular, with spreading branches; *spikelets* egg-shaped, of five or six florets, destitute of a web; *root* fibrous. This little bright green grass, and a little flower called the Shepherd's Purse, are perhaps the two most common plants in the world. Not only is this grass found in every meadow of the temperate zone, but occasionally in most climates, often on mountains at a great elevation. And not alone in meadows do we see its cheerful verdure, but on almost every waste spot where a wild weed may spring;—on the bank by the road-side, among the mosses and stonecrops of the wall, on the garden path, among the stones of the beach just beyond the reach of the tide, with the reeds by the river, on the churchyard grave, and between the crevices of the city pavement where the foot of the passenger daily treads. Be the season inclement as it may, nor winds, nor sleet, nor chilling rains will exterminate it, though the frost may nip its blades. It is in flower all the spring and summer, and occasionally even in Winter, and it ripens its seeds and sheds them in the soil even before the time of weeding commences. It is more useful on meadow-land on which cattle feed than it is fitted for hay. It is one of the sweetest grasses, and it is thought that during more than eight months of the

5
3
4
2
6

year it ripens and deposits seed. This circumstance, and its growth under a lower temperature than any other grass will submit to, render it almost like a perennial on the green mead, and it is well suited for parks and lawns, with the vernal grass and white clover, as it does not turn yellow, like Sheep's Fescue, and some other grasses used for pleasure-grounds, but makes a beautiful and permanent verdure. Much do those who delight in the green lane or wide-spread meadow owe to this little plant. It has many fibres to its root, and they serve to fix the grass so firmly that the frost, which loosens so many plants, leaves this stedfast as ever. "It becomes," says Mr. Knapp, "a support to its needy neighbours in winter, and by its plentiful and sheltering foliage preserves a certain degree of humidity during the exhalations of summer." It is sometimes the prevailing grass on meadow land.

The stem of the Annual Meadow-grass is from six to ten inches high; its leaves are rather blunt, and somewhat soft and drooping. It is the plant to which we might refer when we use the comparison "green as grass," for its hue is always bright and never tinged with purple. (Pl. 261, fig. 5.)

27. Tríodia (Heath-grass).

1. *T. decúmbens* (Decumbent Heath-grass).—*Panicle* of a few 2—4-flowered spikelets on very short stalks, which are often undivided; *glumes* nearly equal, almost as long as the spikelet. Perennial. This grass is very abundant on dry pastures and heaths, especially in mountainous countries. It was formerly included in

the genus Poa, but it is very unlike the plants of that family in its general appearanee, and its spikelets are very mueh larger than those of any Meadow-grass, save *P. flúitans.* The plant varies less than most grasses. Its stems are rigid, from six to twelve inehes high, and bend at the base, but those which bear the flowers are upright. The leaves and sheaths are rather hairy, the former narrow and tapering to a sharp point; and the large spikelets are eommonly four or five in number, and rarely exceed seven; they are arranged alternately on the upper part of the stem. The glumes are rounded on the back, firm and leathery, and of a pale green colour, quite eovering the florets; and instead of a ligule to the leaf there is a tuft of hairs. This grass is of little service on the hilly pasture. (Pl. 262, fig. 1.)

28. Bríza (Quaking-grass).

1. *B. média* (Common Quaking-grass).—*Panicle* with straggling branches; *spikelets* broadly egg-shaped, of about 5 florets; *glumes* very eoneave, heart-shaped, and blunt, and shorter than the florets. Waving to every wind, and shaken even by the approaehing footstep, this pretty quaking, or tottering, or "doddering" grass is plentiful on meadows and pastures in the month of June. Our old writers eall it Pearl-grass, and some eountry people know it by the name of Maiden's-hair. Its botanic name, taken from the Greek verb "to vibrate," is expressive of its nieely-balanced spikelets, whieh hang on branehes so slender as to eause a continual tremulous motion. The stem is twelve or eighteen inehes high, the spikelets are purplish-brown, varied with white, the leaves

tapering to a sharp point. It is frequent in meadows and pastures, and among the short grass of downs, but wherever abundant it indicates a poor soil, and it disappears when the land is brought into better condition. It is too bitter to be a favourite fodder-grass, but cows, horses, and sheep will eat it. (Pl. 262, fig. 2.)

2. *B. mínor* (Small Quaking-grass). — *Panicle* straggling; *spikelets* triangular, about 7-flowered; *glumes* longer than the florets. This is an annual species, with a very slender, erect stem from 1—2 feet high, and very numerous, small pale-green spikelets. It is found in dry and sandy cultivated fields in the extreme south-west of the kingdom, and flowers in July. (Pl. 262, fig. 3.)

29. Dáctylis (Cock's-foot grass).

1. *D. glomeráta* (Rough Cock's-foot). — *Panicle* branched, with oval clusters, which taper to a point; *spikelets* small and densely crowded; *glumes* membranaceous; *root* tufted and perennial. This large, rough, coarse-looking grass may be seen in flower during June, a few occasional clusters lingering on even through the autumn. It is common in every meadow, by roadsides, on moist or dry land, on hill or dale, but most luxuriant among trees and bushes, and well fitted for growing in orchards, or on moist shady spots. The erect, round, rough stem is from 1—3 or even 4 feet high, the upper part usually bearing its tufts on spreading straggling branches; but sometimes these are wanting, and the panicle consists of one tuft, usually tapering towards the summit, and often tinged with a delicate or more deep lilac tint. The leaves,

which are long, flat, and narrowing to a point, are hard, rough on both sides, and of a rather dark bluish-green. This grass yields a very large amount of herbage, which has been found, both by chemical test and experience, to be highly nutritive and much liked by cattle, except when its leaves are very large and coarse. As it shoots up rapidly and plentifully, and produces a good aftermath, it is a valuable grass; but, owing to the coarseness of its stems, it has not been so well liked for hay by our farmers. Professor Buckman remarks of it: "That it is capable of giving a large crop, my experiments fully prove, not only of culms, but also of aftermath; the culms, however, are somewhat coarse, but with their nutritive qualities must be valuable, especially in chaff. I am not aware of its having been tried as a self-crop; but there can be no doubt that, if examples be tried different from those generally employed, this grass has much to recommend it." It has been found to succeed when in combination with the Rough Meadow-grass, the hard variety of the Sheep's Fescue (*duriúscula*), the Meadow Fescue, and the Ray-grass, the far greater proportion being the Cock's-foot. It will thrive even during drought. (Pl. 262, fig. 4.)

30. Cynosúrus (Dog's-tail grass.)

1. *C. cristátus* (Crested Dog's-tail).—*Raceme* in a long, narrow, one-sided spike; *florets* with a very short awn. Perennial. This grass is, during June and July, easily distinguished by the involucre at the base of each of its spikelets, consisting of segments scarcely thicker

than threads, and very rigid. The spikelets are on short stalks, and are arranged alternately on the wavy upper part of the stem. Each spikelet has from 3—5 florets, the outer glumella ending with a very short awn. The slender stem is from half a foot to a foot and a half high, and the leaves are flat, tapering to a point, smooth and shining on the under surface, but rough above. It is a very common grass on dry pastures; and its crested spike may, in August, after the young leaves have been cropped or withered, be seen standing up in numbers, so as to give a brown tint to the sward. It is a grass well fitted by the slender nature of its foliage for lawns and pleasure-grounds, which are often subjected to the scythe, and where it would not remain long enough untouched to assume this brown hue.

The fine, uniform, and strong stems of this Dog's-tail grass have been used in plaiting straw for bonnets, and several other of our native grasses have been found useful for this purpose. Cobbett, who made many experiments on this subject, considered that the straw of our wild yellow oat, *Avèna flavèscens*, was better fitted than any other native species for this purpose; he recommended also the Vernal-grass, Rye-grass, and the Dog's-tail grass as well worth attention; and others have tried with success the Mat-grass (*Nárdus stricta*), and the Sheep's Fescue, as well as some species of Bent (*Agróstis*). It has been thought by good botanists that these grasses might be extensively used for plaiting-straw instead of the wheat-straw now commonly used for bonnets. The wheat which furnishes this straw is chiefly grown on light soils of Bedfordshire and Hert-

fordshire; and though the plait of Essex is superior in point of workmanship, yet the straw produced in that county is not so good as that of Bedfordshire. The straw used in the Tuscan bonnets is obtained from a species of wheat sown on poor soils, that it may produce long slender stems; and the Leghorn hats are made of the same straw differently worked. (Pl. 262, fig. 5.)

2. *C. echinátus* (Rough Dog's-tail grass).—*Raceme* compact, egg-shaped, with awns as long as the glumellas. Annual. This is a very rare grass, found on sandy sea-shores in the extreme south of England, as in Sussex and in Kent, where it has been seen on the chalk near Dover, as well as on some other spots. Its stem is slender, 1 or 2 feet high, the leaves flat, tapering to a sharp point, and rough on both sides; and the author has a specimen gathered near Manchester which is more than three feet in height, with its greyish-green bristly cluster an inch and a half long, but this is unusually large. The spikelets are small, and crowded on short stalks, all turning one way, and the fine divisions of the involucre at the base are very rough. This grass flowers in July. (Pl. 262, fig. 6.)

31. Festúca (Fescue-grass).

1. *F. uniglúmis* (Single-glumed Fescue).—*Raceme* in two rows, turning one way; *lower glume* very minute; *florets* shorter than their awns. Annual. This is a very local grass, known from the other species of Fescue by having apparently one glume, the other being scarcely perceptible. The stem is from half a foot to a foot high, and very leafy. The florets have but one

[illegible] GLUMED FESCUE GRASS.
Festuca uniglumis

[illegible] F. G.
F. bromoides

[illegible] F. G.
F. ovina

4 REED F. G.
F. sylvatica

5 MEADOW F. G.
F. pratensis.

6 TALL F. G.
F. elatior.

7 TALL BEARDED F. G.
F. gigantea

stamen; it grows on sandy sea-shores, and flowers in June. (Pl. 263, fig. 1.)

2. *F. bromoides* (Barren Feseue).—*Panicle* turning one way; *glumes* very unequal, their awns rough. Annual. In one variety of this grass the flowering panicle is ereet and spreading; in another the paniele droops at the end, and is long, narrow, and spike-like. The latter form, *myurus*, is commonly ealled Capon's-tail grass. The Barren Feseue varies very mueh. Its height is from 6—12 inches, and its stem is more or less leafy; it grows on dry pastures and walls. In its ordinary form its spikelets are something like those of the Barren Brome-grass, but ereet and mueh smaller. The leaves are long and slender, like bristles. It flowers in June; its florets have but one stamen, and in the form *myurus* the paniele is sometimes half a foot long. (Pl. 263, fig. 2.)

3. *F. ovina* (Sheep's Feseue-grass).—*Panicle* close, somewhat turning one way; *spikelets* usually with awns half their length; *leaves* all bristle-like; *root* fibrous, tufted, and perennial. This is a most variable grass, and consequently one whieh is exeeedingly puzzling to a young botanist. In one form, *vivipara*, a grass about half a foot high, the spikelet is eonverted into a leafy shoot, and the grass is, in appearance, most unlike its ordinary eondition; in another, *tenuifolia*, the leaves are mueh longer than usual; in *rubra* the root frequently sends out runners, the suekers terminating in erect shoots; but this mark does not appear, from Professor Buekman's experiments, to be eonstant, for, though oeeurring on sand deposits, the root does not creep in

clays; it yields a quantity of fine herbage, but grows in separate tufts, and does not, this botanist says, present any inclination to form matted turf. A well-marked variety, and one which is very unlike the ordinary form of Sheep's Fescue, is that termed *duriuscula*, or Hard Fescue, which is common on dry hilly pastures, often growing to the height of 2 feet, with a large pyramidal panicle with straggling branches, and long and somewhat broader leaves than most forms. The Sheep's Fescue-grass received its specific name from Linnæus, because so much relished by sheep, and he thought that these animals cared little for pastures in which it did not exist. It is too small a grass in its usual form to be very productive, but it grows abundantly on dry elevated heaths and downs, forming a large portion of the grass and fine turf of many a hill-side. It affords a most pleasant and nutritive food to all kinds of herbivorous animals; and Gmelin says that the Tartars choose to fix, during the summer, in those places where there is the greatest plenty of this grass, because of its worth to their flocks and herds. The leaves are very numerous, more or less curved, apt to turn yellow in autumn, and sometimes becoming, on hills near the sea, of bright orange tint. It is abundant on almost all our chalky downs, and its height is from three to nine inches. The latter variety, *duriuscula*, is usually more or less of a sea-green tint, and its panicle often purplish. This, as well as the common form, make excellent grasses for lawns, on account of their fine herbage, and they do not often require mowing. The larger form is an early grass, and will thrive on

almost any soil, though growing naturally mostly on those which are sandy, and it resists drought in summer, and retains its verdure remarkably in winter. It is a most useful grass. (Pl. 263, fig. 3.)

4. *F. sylvática* (Reed Fescue).—*Panicle* erect, much branched; *spikelets* rough; *glumes* very unequal; *leaves* narrowly lance-shaped, rough at the edges; *root* tufted and perennial. There is a small variety, *minor*, with narrow leaves. This is not unfrequent in mountainous woods; its stem is from 2—4 feet high, and has at its base a number of brownish scales. The leaves are long, and of somewhat yellowish green. It flowers in July. It is an early grass, but one not much relished by cattle. (Pl. 263, fig. 4.)

5. *F. praténsis* (Meadow Fescue).—*Panicle* always close; *branches* in pairs, one bearing a single spikelet, the other one or more spikelets, sometimes wanting; *spikelets* 5—10 flowered; *outer glumella* scarcely awned. Perennial. In one variety of this grass some or all of the branches of the panicle are in pairs, one usually having several spikelets. In another, which is often described as a distinct species (as *F. loliacea*), the spikelets are arranged alternately on the stem in a spiked form, either without stalks or with very short stalks. This form is very much like the Floating Meadow-grass in appearance, and it is a grass much valued by owners of grass lands. The Meadow Fescue is from a foot to a foot and a half high, the leaves flat and rough, the upper spikelets on branches springing immediately from the stem. It is a very common plant, often forming a large portion of our meadow-grass near rivers or

streams, the variety *loliàcea* being less frequent. Though rather a coarse grass, yet the Meadow Fescue is, when young, much relished by cattle and sheep, and affords excellent hay. On some soils it becomes extremely large and coarse, and hence less serviceable. (Pl. 263, fig. 5.)

6. *F. elátior* (Tall Fescue-grass).—*Panicle* loose, spreading, with many branches, which are mostly in pairs, each bearing 2 or more spikelets, and straggling after flowering; *spikelets* very numerous, and shortly awned. Perennial. This grass differs from the preceding in appearance, yet many botanists consider it not as a distinct species, but a merely accidental variety of it. The genus *Fescue* was once believed to contain many more species than now, as experience has proved that some plants considered distinct gradually run into one type under culture and on different soils. This is not an unfrequent plant in wet meadows, flowering in June and July, and growing in large coarse tufts. It differs from the *F. pratensis* by its much branched spreading panicle. The upper spikelets are on short stalks proceeding from the stem, the lower ones on simple or divided branchlets, the cluster being large and having a full and branched appearance. The leaves are flat, tapering to a point, rough within, and smooth on the outside. The branches of the panicle are rough, and the panicle often bends to one side. It is a very productive grass, and its herbage, though coarse, is nutritious. Dr. Calvert says it is ravenously preferred to all other grasses by cattle and horses. (Pl. 263, fig. 6.)

7. *F. gigantéa* (Tall-bearded Fescue). — *Panicle* branched, drooping towards one side; *spikelets* 3—6

1. ERICHT BROME GRASS
Bromus erectus

2. HAIRY WOOD [illegible]
[illegible]

3. [illegible] ANNUAL [illegible]
B. [illegible]

flowered; *glumes* very unequal, awn very long, inserted a little below the point of the outer glumella. Perennial. In a form found in Norfolk the panicle is larger and more drooping; in another the panicle is smaller and erect, the leaves are narrower, and the spikelets about 3-flowered. This grass when fully grown may be distinguished by its large size, for it is one of the very tallest of our grasses, and one which is common in shady woods and moist hedges. In the latter places it often even overtops the shrubs; for when shade and moisture combine, its stem will sometimes rise to the height of 6 feet, while in drier places it is not more than half as high. Its stem is leafy, and the upper sheath is larger than the leaf. The leaves are broad, flat and rough on both sides, and of a deep green colour; but the panicle is pale green. This is large and loose, much like the Brome-grasses, especially the Hairy Wood Brome-grass, but with smaller spikelets and of a brighter green colour; the abundant foliage is eaten by cattle, but this is not one of the most nutritious grasses. It flowers in July and August. (Pl. 263, fig. 7.)

32. Brómus (Brome-grass).

1. *B. eréctus* (Upright Brome-grass).—*Panicle* erect without branches; *spikelets* narrow, lance-shaped, erect; *florets* distant from each other, about twice as long as the straight awn. In one form the spikelets are smooth and shiny, in another they are downy. Perennial. This is not a common grass, but grows on dry sandy or chalky soils in fields and by road-sides. The stem is commonly smooth and round, and 2 or 3 feet high; the root leaves

are narrow, and the upper leaf always much broader than the others. The erect panicle expands in June and July, and is remarkable in the early part of its growth for the purplish colour of the spikelets and their awns. The grass is frequent on the dry stony hills of Somersetshire, Gloucestershire, and Wiltshire, where it attains unusual luxuriance, and its ordinary height is 2 or 3 feet. In its wild state it is one of the most common grasses of the Cotswolds, where it descends also into the vale. It is remarkable for being the only native species, if not the only species, of Brome-grass which is perennial. It is a harsh plant, and has long been known to be rejected by cattle. Professor Buckman remarks: "Its agricultural value is practically demonstrated by the disinclination of cattle to eat it, and the very poor hay it makes; and it is interesting to find that in the analysis of twenty species of our commonest meadow grasses by Professor Way, this grass in the dry state stands the seventeenth in its amount of albuminous or flesh-forming principles, being nearly at the bottom of the list, or among the last in point of value." (Pl. 264, fig. 1.)

2. *B. ásper* (Hairy Wood Brome-grass).—*Panicle* drooping, with long, little divided branches; *florets* remote, hairy; *awn* straight, shorter than the larger glume. Annual. This is one of the commonest species of the genus; and its slightly rough stem, which is 3 to 6 feet high, bears in June and July an elegant nodding panicle of spikelets, which are sometimes an inch long, of a greyish green hue, and rough branches. The root leaves are very broad, much more so than those

5
4
3
2
1

on the stem, silvery hairs are scattered over them, and they are rough to the touch. This grass grows in moist woods and hedges, but is of no agricultural value, being so harsh and coarse that cattle rarely eat it. (Pl. 264, fig. 2.)

3. *B. stérilis* (Barren Brome-grass). — *Panicle* drooping, with long, little divided branches; *spikelets* very long; *florets* distant from each other, shorter than the straight awn; outer *glumella* very distinctly 7-ribbed. Annual. In the month of July this tall and handsome grass hangs its cluster of large narrow long-awned spikelets, each on a long slender branchlet, in many a hedge, or on waste ground, or road-side. In the early period of their growth they are pale green, sometimes delicately tinted with purple; they afterwards become dull greyish green or occasionally dingy brown, and their awns are at all times very conspicuous. The stem of this grass is 1 or 2 feet high, faintly marked with lines; the leaves broad, flat, tapering to a point, and downy. It is one of our commonest grasses, and one which often mingles among the clustered grasses in the winter bouquet. It flowers in June. Cattle never eat it. (Pl. 265, fig. 1.)

4. *B. diándrus* (Upright annual Brome-grass).— *Panicle* erect, with scarcely divided branches; the long narrow *spikelets* mostly on short stalks rising directly from the stem; *florets* erect, about as long as the straight awn. In one form, having a compact panicle, the stem, branches, and glumes are downy; in another, the stem is smooth, except at the upper part, and the branches are rough. This is an annual grass, very rare,

and of little or no service to the agriculturist. It is found on sandy barren spots, chiefly in the South of England, grows below St. Vincent's rocks near Bristol, and more rarely about Edinburgh. The round smooth stem is about a foot high, the panicle smaller than in the last species, and always upright; the spikelets are large and often of a purplish hue, and the somewhat hairy leaves are long and taper to a point. Its flowers have 2 stamens. (Pl. 264, fig. 3.)

5. *B. máximus* (Great Brome-grass).—*Panicle* loose, upright at first, but finally drooping, the branches little divided and becoming longer after flowering; *spikelets* downy; *florets* distant from each other, and about half the length of the straight awn; outer *glumella* about half as long as its awn. Annual. This handsome grass is remarkable for its long awns. It is 1 or 2 feet high, the leaves downy on both sides. It flowers in June and July on sandy places in the Channel Islands. (Pl. 265, fig. 2.)

6. *B. secalínus* (Smooth Rye Brome-grass).—*Panicle* loose, its branches little divided; *spikelets* large, oblong, flat; *awn* straight, about as long as the floret; the edges of the glumellas not overlapping those of the floret above them. This is a conspicuous plant when, in June and July, its paniele, 3 or 4 inches long, and composed of large flat spikelets, on very slender branches, stands on a stem 2 or 3 feet high. The branches of the paniele are hairy, and the yellowish green spikelets polished. The leaves too are hairy, especially so on the upper surface; and as the grass ripens, the florets become distinct and the spikelets

droop. The seeds are said to impart a bitterness to flour if accidentally mingled with wheat, and the large size of the grass renders it a very troublesome plant in the rye or wheat field, where it is not unfrequent. It is considered a doubtful native. A variety occurs in which the spikelets are downy and the panicle little branched. This is found near Edinburgh. (Pl. 265, fig. 3.)

7. *B. commutátus* (Tumid Field Brome-grass).—*Panicle* loose, slightly drooping, the branches divided; the *simple flower stalks* as long or longer than the oblong spikelets; *florets* overlapping each other, but not closely, about as long as the straight awn; *sheaths* hairy. This is a common grass, its herbage growing very early in the year, and its flowers expanding in June and July, by road-sides and in corn-fields. The spikelets are long and glossy, not so broad as those of the last species, and often tinged with purple, and the stem is sometimes three feet high, and rough, as are also the branches of the panicle and the leaves. Sir W. J. Hooker remarks in his British Flora, "'This species,' says Mr. H. Watson, who has studied the British Brome-grasses with great attention, 'is known by its glossy grey green spikelets acquiring a brownish tinge in sunny spots, its longer and harsher peduncles (footstalks) than those of *B. móllis*, and *racemósus*, and its glumellas larger and more inflated than in *B. secalínus* and *arvénsis*.'" This is a nutritive grass, useful in the spring. (Pl. 265, fig. 4.)

8. *B. móllis* (Soft Brome-grass).—*Panicle* erect, close; *spikelets* egg-shaped, somewhat flattened, downy; *florets* overlapping each other closely, and about as long as the straight awn. In one form the panicle is unbranched,

the spikelets are on very short stalks, and, as well as the leaves, thickly covered with down. This is among our most common grasses, growing in almost every meadow, as well as on the sunny banks of our road-sides, and in field borders. It has an erect downy stem a foot or a foot and a half high, and its leaves and sheaths are hairy. It flowers in May and June. The spikelets are large, but smaller than those of the last two species, and are of a very beautiful bright, but not deep green, the chaffy edges of their glumellas showing so plainly that they look as if variegated with white and green. Their glumes and outer glumellas are somewhat downy, and this feature distinguishes the plant from *B. racemósus*, in which these parts, instead of being soft to the touch, are rather rough. The panicle is two or three inches long. The very downy variety is found on sandy ground in Cornwall; it is of a less bright green colour than the ordinary form. The farmer includes the soft Brome-grass with the Barren species among his worthless grasses. (Pl. 265, fig. 5.)

9. *B. racemósus* (Smooth Brome-grass).—*Panicle* close, long, and upright, usually with each spikelet on a short stalk, but sometimes with slightly divided branches; *spikelets* egg-shaped, slightly flattened, overlapping each other; *awn* straight, about as long as the glume. This appears to differ from the last species chiefly in being smooth instead of downy. It grows commonly in meadows and pasture lands; flowering in June and July, and its shining spikelets are usually of a lighter green than those of the last species. Its erect round stem is a foot and a half or two feet high. Its herbage shoots

1 SMOOTH BROME GRASS.
Bromus racemosus

2 TAPER FIELD B. G.
B. [illegible]

3 SPREADING B. G.
B. patulus.

4 CORN B. G.
B. squarrosus

early in the spring; but it is not a valuable grass, and grows chiefly on poor soils. (Pl. 266, fig. 1.)

10. *B. arvénsis* (Taper Field Brome-grass).—*Panicle* upright, spreading, branched; the *partial flower stalks* longer than the narrow flattened spikelets; *glumellas* shorter than the straight awn; *anthers* remarkably long and narrow. In this plant the glumellas usually acquire a purple tinge, and the flower-stalks are longer than in the preceding species. It is a naturalized grass, found at Southampton, and a few other places; flowering in July and August, and is a lighter, prettier, and more graceful species than the last, with spikelets much smaller than those of most Brome-grasses. (Pl. 266, fig. 2.)

11. *B. pátulus* (Spreading Brome-grass.)—*Panicle* erect, spreading loose, drooping in fruit, the lower stalks much lengthened, and either simple or branched; *spikelets* lance-shaped, flattened; *glumellas* rather shorter than the nearly straight awn. Annual. This grass, which is nearly allied to the preceding, is not truly wild. It has been accidentally introduced into the neighbourhood of Hebden Bridge, Yorkshire. (Pl. 266, fig. 3.)

12. *B. squarrósus* (Corn Brome-grass).—*Panicle* drooping, branches undivided; *spikelets* oblong, somewhat flattened; *florets* overlapping each other, nearly smooth; *awn* straggling. Annual. This grass appears to be of recent introduction, and its seed probably came mingled with foreign corn. The spreading awns form a characteristic distinction of the species. It has been found in Kent, Somersetshire, and other counties. (Pl. 266, fig. 4.)

33. Avéna (Oat).

1. *A. fátua* (Wild Oat).—*Panicle* large and spreading, its branches rough; *spikelets* drooping; *glumes* large, keeled, and taper-pointed; *florets* 2—3, much awned, smaller than the glumes, with a number of long, stiff, yellowish hairs attached to the base of the outer glumella; *root* annual and fibrous. Several Oat-grasses intrude themselves into the corn-fields, and this is a very common weed there in June, July, and August, rising to the height of three feet. Its flat bright green leaves are marked with fine lines, and the long twisted awn of the glumella serves as an excellent hygrometer, being affected by the smallest change in the atmosphere. This grass is so like the cultivated oat, *A. satíva*, that some think it is but a variety of that plant, from which it is distinguished by its longer awns, and by the stiff hairs at the base of the glumella. Professor Buckman, however, remarks that it is approached in the latter respect by occasional starved or seeded specimens of the field oat, in which the hairs occur. "This circumstance," he observes, "gives some countenance to the belief so general among the farmers of the heavy lias clays, in the Vale of Gloucester, namely, that it is unsafe for them to cultivate oats because they leave behind a degenerated race of wild oats." At any rate it is a troublesome weed, especially in stiff sterile lands. It is common in fields of this kind, either of wheat, barley, or oats, as well as among beans; and its blades being in its early growth so like those of corn, it cannot in the corn-field be distinguished, and is therefore left behind, after hoeing.

1 WILD OAT GRASS.
Avena fatua.

2 BRISTLE POINTED O. G.
A. strigosa

3 NARROW LEAVED PERENNIAL O. G.
A. pratensis

Farmers have long known that the seeds of the wild oat lie a long time uninjured in the soil; and so large is the plant, that it occupies a considerable space on valuable lands, and helps to keep off sun and air from the corn, ripening too before the wheat, and shedding its grain before that is removed from the land. It is a handsome grass with its large cluster of pale green spikelets, their chaffy glumes striped with green lines, and nodding on their slender branches, though the main stem of the grass and of its cluster are erect.

The oat was very early cultivated in this country; its name is a Saxon one, and evidently connected with the verb to eat, the grain having been used as a bread corn as well as for horses. In very old books it is called Haver or Hafer corn; our old herbalists called it ote, ete, or haver; and several European countries have a very similar name for the plant. The officer of the household, who in ancient times had to supply provender for the horses, "horssemete" as it was called, was also termed an Avenar or Avenere, from the Latin name of this grass. In Wales the oat is still called Hever. This elegant grass is the cognizance of the Duke of Montrose. (Pl. 267, fig. 1.)

2. *A. strigósa* (Bristle-pointed Oat).—*Panicle* erect, the branches all turning to one side; *florets* awned, two in each spikelet, each as long as the glumes, and terminated by two long, straight bristles. Annual. This species is common in cultivated fields in June and July, where

> "The bristly barley's purple bloom
> Waves in the gale its egret plume,
> Waved in the gale as lightly float
> The pendants of the bearded oat."

It is much like the oat, among which it often grows; but its upright panicle, and the long straight bristles at the end of the florets, form a distinction both from that plant and the last species. Its stem is two or three feet high, round and smooth, the leaves are rather broad and rough, the spikelets large and oval, their glumes marked with green lines. It flowers in June and July. (Pl. 267, fig. 2.)

3. *A. praténsis* (Narrow-leaved Perennial Oat).—*Panicle* erect, loose, its branches either simple or little divided; *spikelets* oblong, erect, of 3—5 florets, longer than the glumes. Perennial. In a variety of this plant, *vulgáris*, the lower leaves are rolled inwards, and their sheaths nearly smooth; in *longifólia* the leaves are very long and narrow, the sheaths rather rough, and the panicle of more yellowish colour; in *alpína* the lower leaves are short and flat, and the sheaths somewhat rough. These varieties differ very much from the ordinary appearance of the plant. This is not a meadow grass of the low-lands, though found on some dry pastures, chiefly in mountainous regions, and it often grows in the crevices of rocks, and sometimes on dry open heaths. The stem is one or two feet high, smooth and glossy, the leaves shining, but more or less rough to the touch. The spikelets are tinged with brown, and their twisted awns are often nearly twice as long as the glumella; cattle sometimes eat its foliage. It flowers in June and July. (Pl. 267, fig. 3.)

4. *A. planicúlmis* (Flat-stemmed Oat).—*Panicle* erect, with many rigid short branches; *spikelets* erect, 5—7-flowered, narrow, oblong; *florets* much longer than the

1 FLAT STEMMED OAT GRASS
Avena planiculmis

2 DOWNY O G
A pubescens

3 YELLOW O G
A flavescens

4 COMMON REED
Phragmites communis

glumes. Perennial. This grass has broad leaves, tapering suddenly to a point, with very fine serratures at the edges, and flat-keeled leaf sheaths, the lower part so flat as to become two-edged. It flowers in July. It was discovered by Mr. Stuart Murray, in 1828, in the Isle of Arran, in Scotland. Sir W. J. Hooker remarks of it that it has ever since been cultivated in the Botanic Gardens of Glasgow, where it preserves its characteristic distinction; and adds that the plant is there nearly three feet high, and its leaves half an inch broad. (Pl. 268, fig. 1.)

5. *A. pubéscens* (Downy Oat).—*Panicle* erect, almost without branches; *spikelets* erect, of about 2—3 florets, scarcely protruding beyond the glumes. Perennial. This is a pretty grass in June and July, when it is in flower. Its spikelets are much smaller than those of the last species, and in the sunshine they glisten as if cut out of silver and tinged with purple, in a slender cluster three or four inches long, their hue differing from that of any other wild oat-grass. The plant is not unfrequent in chalk or limestone districts. The stem is one or two feet high, and the upper leaf has a remarkably long sheath. The leaves are somewhat broad, flat, flaccid, and hairy on both sides, and the long awns are of purplish colour, and twist and often cross each other. (Pl. 268, fig. 2.)

6. *A. flavéscens* (Yellow Oat).—*Panicle* much branched; *glumes* very unequal; *spikelets* about 3-flowered; *root* somewhat creeping and perennial. This is among the commonest of the oat grasses, and may be seen in July, on dry sandy or stony meadows, where it is conspicuous

by its cluster of yellow flowers, which is often four inches long. The stem is about a foot high, and the hairy leaves are of a light green hue. The shining spikelets are much smaller than those of any other species, and much more numerous, and they are peculiar too for their unequal glumes. By the end of July the yellow colour of the cluster changes to a dull brown hue. The plant is not very leafy, but the foliage is relished by cattle. It is the stem of this plant which Mr. Cobbett thinks superior to any native grass for straw plait; it has very few knots. (Pl. 268, fig. 3.)

34. Phragmites (Reed).

1. *P. communis* (Common Reed).—*Panicle* large, loose; *spikelets* 3—5-flowered, longer than the very unequal glumes; *florets* enveloped in long silky hairs attached to the rachis of the spikelet. Perennial. All who have lingered at midsummer by the country streams, listening to their music as the waters rustled the sedges or rippled softly over the stones, have observed this tall purplish brown grass, like a waving feather, growing in thick masses, and five or six feet high. In its early growth the cluster is close and of a deep rich purplish brown; then the tint becomes lighter, and the plume, at that time a foot or more long, droops gracefully on one side. A little later the numerous spikelets seem to have turned to pale grey, by the growth of the long silky hairs which surround the florets, and they are thenceforward a mass of down. One may see far away on the landscape this tall reed, fringing many a river,

and forming there a miniature grove. Its smooth leaves, about a foot long, are ribbed, rough on the edges, and of a bright green colour. Patches of immense extent are formed by this plant in the eastern part of England, and called there Reed-ronds. Great use is made of the stems in thatching cottages and barns, for they make the very best of thatch, and the practice of so using them seems very old, as we find Tusser, in his poem, directing the husbandman to the timely care of his roof:—

> "Where houses be reeded,
> Now pare off the moss, and go beat in the reed."

The long stems serve also for cottage ceilings, for screens, and other household purposes; while these, as well as the long creeping roots, are turned to good account in forming embankments near the river. In Sweden the panicle is used by country people to dye woollen cloth of a rich green. Our own villagers sometimes make a pickle of the young shoots, which they cut off from the root; and in early days the long stems were used not only for arrows, but also instead of quills for writing. This elegant plant is not merely an ornament to the margin of the waters. In many low lands of Huntingdonshire, Cambridgeshire, and Lincolnshire, this reed constitutes the crop of the moist soil, and in its proper season is duly harvested, and even taken for sale into neighbouring counties for the various uses to which it may be applied. An immense number of aquatic birds find their home among these reeds; and the ornithologist sometimes finds sheltered there the rare bearded titmouse, with many of the more common

birds; while the sedge warbler hangs her nest on the tall reed, and swings in her safe cradle to the rocking winds. So much injury is done by some birds to the reed crops that the farmers of these districts are compelled, during autumn, to be at much trouble to scare them from their haunts. Mr. Knapp remarks—"As evening advances, one sees crowds of starlings approaching from every quarter in numbers that exceed belief, to pass the night among the reeds, upon which, after various arrangements, they alight in myriads, bearing down by their weight this flexible plant into the water, and one sees large patches lodged, and beaten flat, and spoiled." Men go out in boats to shoot them, and kill hundreds night after night, yet these bold birds still come to the reed-ronds; and as the fox lurks there to seize them, he also tramples down a large number of the reeds.

Many of the reed-crops are now altogether destroyed by the improvement of the land by drainage, and millions of their waving plumes have disappeared before the railroads, and other inventions of recent times. Now and then, as we read in some old book, we are reminded how much more abundant these and other aquatic plants must have been in the earlier ages of England. In the Anglo-Saxon version of the Life of Guthlac, Hermit of Crowland, first printed about ten years since from a MS. in the Cottonian Library, and apparently written before A.D. 749, we find continual allusion to these reeds, and see how the fens, with their plants, overspread land from which they have now been expelled, to make way for houses and fields of

1 UPRIGHT SEA LYME GRASS
Elymus arenarius
[illegible] S. S. L. G.
[illegible]
3 WOOD BARLEY
[illegible]

4 MEADOW B.
H. pratense
5 WALL B.
H. [illegible]
6 SEA SIDE B.
H. [illegible]

waving corn. "There is, in Britain," says the old writer, Felix of Crowland, "a fen of immense size, which begins from the river Granta, not far from the city of Grantchester. There are immense marshes, now a black pool of water, now foul running streams, and also many islands, reeds, and thickets; and with manifold windings, wide and long, it continues up to the North Sea." No wonder that Crowland, which was in the midst of this wilderness, was described as a place of "manifold horrors and of loneliness, so that no man could endure it;" and no wonder that the hermit who went to live there had his home among reeds and rushes, or that some of the incidents recorded by his chroniclers occurred in the "mere, amidst the bed of reeds."

The reed-grass is commonly called windle-straw by country people:—

> "And the windle-straw so limber and grey,
> Did shiver beneath the tread
> Of the coursers' feet."

There is a variety of this plant which has prostrate stems from 20 to 40 feet in length. (Pl. 268, fig. 4.)

35. Élymus (Lyme-grass).

1. *E. arenárius* (Upright Sea Lyme-grass).—*Spike* upright; *spikelets* of about 3 florets; *glumes* two, tapering to a point and downy; *glumellas* broader than the glumes; *root* creeping and perennial. The Lyme-grass, which grows in abundance on some parts of our shores, forms in May large patches of bluish-green blades, and bears its flowers in June and July. Its

spike is from 4 to 5 inches long, erect, of a sea-green colour, standing on a stem from 2 to 5 feet high; the leaves are long, broad, hard, and rigid, rolled inwards, and ending in a sharp point. Its masses often serve as a little oasis on the desert-looking sand flats, sheltering some sand flowers or green weeds, which, but for its protection and the solidity of soil given by its long creeping roots, could not grow there; and it is one of our most serviceable plants in fixing the sands. Many parts of the coast are quite destitute of it, but on spots where it is abundant, it may be known even far away by the peculiar bluish colour of its foliage. The only grass for which it could possibly be mistaken is the *Marum* or Sea-reed, and it differs from this in having its spikelets seated closely on the main stem, whereas those of that grass are on short foot-stalks. The seeds are in Iceland ground into flour, and used for making bread, and the grass affords a great amount of saccharine matter. It is not eaten by cattle, and, valuable as it is on our shores as a sand grass, it is far more necessary to those of Holland. (Pl. 269, fig. 1.)

2. *E. geniculátus* (Pendulous Sea Lyme-grass).—*Spike* loose, bent downwards; the part of the stem on which the *spikelets* are seated, winged; *glumes* awl-shaped, smooth, longer than the spikelet. Perennial. This plant, which is found in a salt marsh near Gravesend, is not known to grow in any other part of the kingdom, and is rendered so singular by its kneed stem as to be readily distinguished from any other grass. The spike is erect in an early stage of its growth, and the stem next bends into a horizontal

position, finally turning downwards, when it withers and falls off at the joints. The leaves are rigid and rolled inward, the stem about 1 or 2 feet high, bearing in July its very long spike. (Pl. 269, fig. 2.)

36. Hórdeum (Barley).

1. *H. sylváticum* (Lyme-grass, or Wood Barley).—*Spike* upright, compact; *glumes* all awl-shaped, not fringed, rough; *outer glumella* with an awn half its length; *lateral spikelets* with both stamens and pistils, middle ones without either. Perennial. This grass differs chiefly from the next species in having longer awns; it is common in woods and thickets in chalky soils. The leaves are flat, ribbed, acute, rough on both sides, pale green, and pliant; and the spike, which appears in June, is green and 2 or 3 inches long, on an erect smooth stem, about two feet high. (Pl. 269, fig. 3.)

2. *H. praténse* (Meadow Barley).—*Spike* upright, compact; *glumes* all bristle-like and rough, not fringed; *outer glumella* of the middle spikelet about as long as its awn,—of the lateral ones with a short awn; *lateral spikelets* with neither stamens nor pistils; *central flower* largest, and perfect; *root* fibrous, annual. This is a common grass in damp meadows, and has a smooth stem about a foot and a half or two feet high, with a close spike two or three inches long. It is a slender plant, the leaves narrow and rather rough. It bears in early spring a considerable quantity of foliage, but the roughness of its awns unfits it for hay or pasture grass. (Pl. 269, fig. 4.)

3. *H. murínum* (Wall Barley, Way Bennet).—*Spike*

upright, compact; *glumes* of the middle spikelets lance-shaped, and fringed,—of the lateral ones, bristle-like and rough; *middle spikelet* with stamens and pistils; lateral ones with neither; *root* fibrous and annual. Every English child knows this common grass, so like the cultivated barley of the field as to be universally called Wild Barley. It is a shorter and stouter species than the preceding, and though not common in Scotland, is found throughout England on walls, cottages, and by roadsides, but rarely occurring among our meadow-grasses. Though not flowering till midsummer, yet it gives early a large quantity of herbage. The stem is a foot or a foot and a half high, the spike about two inches long, and the leaves are flat and rather rough. Both this and the next plant seem to be known by the name of Squirrel-tail Grass; and though there is considerable nutriment in the foliage, yet so much do the prickly awns injure the mouths of horses, that one of the greatest recommendations to an inn in the Isle of Thanet used to be, that the hay was without any admixture of Squirrel-tail Grass. The awns of these barley-grasses are not only long and slender, but they are also thickly set with a double row of very minute spines, so that if this plant happen to intrude itself into the pasture, it causes much irritation to the tongue and throat of an animal eating it. These prickly awns will, on the slightest friction, propel the plant rapidly along, as every country child well knows, from the common practice of putting an ear of barley-grass into the sleeve, and allowing it to make its way from the wrist to the shoulder, which it will do in the

1 CRESTED WHEAT
2 BUSHY SEA W.
4 FURROW FESTUCA

course of a few minutes. It grows chiefly on sandy soils. (Pl. 269, fig. 5.)

4. *H. marítimum* (Sea-side Barley).—*Spike* compact, erect; *glumes* rough, the inner one of the lateral spikelets half egg-shaped, the rest bristle-shaped and rough; *awn* of the outer glumella in the middle spikelet more than twice as long as the awn of the lateral ones; *middle spikelet* with both stamens and pistils, *lateral* ones with neither; *root* fibrous and annual. This is the smallest of the species, and scarcely ever more than half a foot high, with an erect stiff stem which is prostrate at the base and bears a small spike. It much resembles the last species, but is shorter, more rigid, and of a paler, almost sea-green colour. It is not universally distributed on our sea-coast, but is not uncommon on grassy and sandy places there. It flowers all the summer months. (Pl. 269, fig. 6.)

37. Tríticum (Wheat, or Wheat-grass).

1. *T. cristátum* (Crested Wheat-grass).—*Spikelets* of about four crowded florets; *glumes* awl-shaped, with a terminal awn; *outer glumellas* with an awn as long as themselves; *root* of long fibres, perennial. This grass is not considered as truly wild, but is described as found by Mr. Don, many years since, on the coast between Arbroath and Montrose. Its spike is an inch or more long, on a stiff, slender, leafy stem, remarkably rough, and about eighteen inches high. (Pl. 270, fig. 1.)

2. *T. júnceum* (Rushy Sea Wheat).—*Spikelets* of 4—6 florets; *glumes* blunt, many ribbed, awnless; *outer glumella* blunt, or tipped with a short spine; *root*

ereeping and perennial. This is a common grass on sandy sea-shores, and often conspicuous there; its close spike of distant flattened spikelets on two rows, and from six to nine inches long, is supported by a stem from twelve to eighteen inches high. It is a rigid plant, with smooth leaves rolled inward, very slightly downy on the upper surface, and pale green. The part of the stem on which the spikelets are situated readily breaks away at the joints. It is a useful grass in binding down the sands, and like most grasses destined for that purpose, is left untouched by animals. (Pl. 270, fig. 2.)

3. *T. répens* (Creeping Wheat, or Couch-grass).— *Spike* very long; *spikelets* 4—8-flowered; *glumes* lance-shaped, with or without awns; *outer glumella* sharply pointed, or with a short awn. In one form the rachis is smooth or downy, but always with short ascending bristles on the angles; in another the rachis is quite smooth. The second form, which is found near the sea, is of a pale sea-green colour, and is distinguished by having its florets awned, and the edges of its leaves rolled inwards. The creeping perennial root of this Couch-grass is but too well known to the agriculturist, rendering this one of the most troublesome of all the weeds which he has to contend with. The plant is very abundant on many arable lands, as well as on waste places, often giving a green colour to patches of a hedge-bank in winter, when its flat, rather dark green, and somewhat rough leaves hang about the slope. Its roots are most difficult of extirpation, and will retain their vitality amid many injuries. It flowers in the summer months, and its spike occupies about a third part of its stem, which is round, erect,

smooth, marked with lines, and one or two feet high. The roots or underground stems are very sweet and nutritious, cattle of all kinds being fond of their shoots, which are found to contain three times as much nourishment as the stem and leaves. They have been recommended as suitable to be used in brewing table-beer. The Couch-grass is as common in most other European countries as in ours, and abounds even in Siberia. It is known to our farmers by several familiar names, as White Couch, Twitch, Stroil, and Quickens. (Pl. 270, fig. 3.)

4. *T. canínum* (Fibrous-rooted Wheat-grass).—*Spike* very long, slightly inclining; the *spikelets* near together, 2—5-flowered; *glumes* lance-shaped, 3—4-ribbed, awned as is the outer glumella; *root* fibrous, perennial. In one variety of this grass, found on Ben Lawers, the spikelets are 4—5-flowered, the awn of the florets longer than its glumella, and the leaves rough on both sides; in another the awn of the florets is very short, and the leaves quite smooth, except on the margins. This is a very common grass in woods and hedges, and is distinguished from the last by its roots, which consist of numerous downy fibres. Its round, erect, leafy stem is from two to four feet high, the leaves are flat, of a dark-green colour, the spikelets being seated on the rachis in two rows, and forming a spike three or four inches long. This plant flowers in June and July, and is called Dog's wheat, because this, and probably the other species, are eaten medicinally by these animals. All the species have, when their foliage is bruised, a strong odour unlike that of other grasses. (Pl. 270, fig. 4.)

38. Brachypódium (False Brome-grass).

1. *B. sylváticum* (Slender False Brome-grass).—*Spike* drooping; *spikelets* nearly cylindrical, inclining one way; *awns* longer than their glumellas; *root* fibrous, and perennial. This grass and the next have been placed by former botanists either among the Fescue, Brome, or Wheat grasses, and seem to hold an intermediate place between the two latter. The Slender False Brome-grass is of no value to the agriculturist, as cattle seldom touch it. It grows in woods and hedges, especially in the western counties, flowering in June and July. Its stem is round and smooth, two feet high; its leaves flaccid, broad, hairy on the upper side, and of a deep green colour. It is readily distinguished from the next species by its slender spikelets, as well as by its growth among bushes or trees. (Pl. 271, fig. 1.)

2. *B. pinnátum* (Heath False Brome-grass).—*Spike* erect; *spikelets* nearly cylindrical, in two rows; *awns* shorter than the glumellas; *root* somewhat creeping, perennial. This grass has flat, narrow, rigid, nearly smooth leaves, and in July is very elegant, especially on those chalky, upland, heathy places where it attains great luxuriance. It is always an indicator of a poor soil, and disappears as the land is improved. It is a rare grass, growing in open places in several counties, and was, a few years since, exceedingly luxuriant and beautiful among the grass of Shorncliffe, Kent, where it sometimes grew to the height of three feet, though it is commonly about two feet high. It sometimes has a

1 SLENDER FALSE BROME GRASS, *Brachypodium sylvaticum*
2 HEATH F B G, *B pinnatum*.
3 PERENNIAL RYE G, *Lolium perenne*
4 BEARDED R G, *L multiflorum*
5 ANNUAL FLAX R G *L bunicola*
6 DARNEL, *L temulentum*

double row of spikelets, and a variety with leaves rolling inwards is found near Bath. It is of no value to the agriculturist. (Pl. 271, fig. 2.)

39. Lólium (Darnel Rye-grass).

1. *L. perénne* (Common Rye-grass, Red Darnel, or Beardless Darnel).—*Spike* erect, occasionally compound; *spikelets* 6—8-flowered; *glume* solitary, scarcely longer than the florets, awnless; *root* fibrous, perennial. This common grass of waysides and pastures, with a dark green or purplish green spike, about a third of the length of the stem, is commonly one or two feet high. It varies, however, very much according to the soil on which it grows, being sometimes not half a foot in height, at others rising to that of three feet. Sometimes the spikelets are few and distant, at others they are very close together, and occasionally the spike becomes clustered. It flowers in June and July. Several stems grow together, and are round, smooth, rigid, with purplish joints, and the leaves are pointed, smooth, and marked with lines. The root produces leafy, barren shoots. This grass is extensively cultivated, but in many soils it loses its perennial nature, and becomes a biennial grass. It is believed to be the meadow grass which was earliest cultivated in Europe, though the period at which it was first sown is uncertain. Dr. Plot remarks of it in 1677, "They have lately sown Ray grass, *Gramen loliaceum*, to improve cold, sour, clayey, weeping ground, unfit for Saint-foin." It was sown in the Chiltern parts of Oxfordshire. It has several varieties, known to farmers as Pacey's grass, Russell's Rye, &c. (Pl. 271, fig. 3.)

2. *L. multiflórum* (Bearded Rye-grass).—*Spikelets* many-flowered; *glume* solitary, scarcely so long as the lowest floret; *florets* lance-shaped and awned; *roots* producing barren, leafy shoots, sometimes perennial, becoming biennial or annual under cultivation. This plant is found in some parts of England and Scotland, but only where it has been cultivated in fields. It is the well-known meadow grass, called by the farmers Italian Rye-grass, and is by Dr. Parnell considered a variety of *L. perenne*. Professor Buckman found that both in that and this plant when grown in the Botanic garden, the annual seeding caused the old plants to periodically die out, but they being replaced by seedlings, the first form, *L. perenne*, was tolerably well maintained from year to year; but that the *L. Itálicum*, which he considers as being a variety of *L. perenne*, has a tendency to revert under such circumstances of growth to the original form. The Italian Rye-grass is a handsome plant, its long awns giving it a crested appearance at midsummer. It is paler in colour than the common perennial species; like that it varies much in height, being sometimes even three feet high, and having several erect stems, which grow in close tufts. It was introduced into culture in this country from Italy. (Pl. 271, fig. 4.)

3. *L. linícola* (Annual or Flax Rye-grass).—*Spikelets* many-flowered, oblong or egg-shaped; *outer glumella* longer than its awn, or awnless; tumid in fruit; *root* annual, without leafy shoots. This is a very rare grass, found in cultivated fields near Catterick Bridge in Yorkshire, and about Hurst-pierre Point, Sussex. It flowers in July. (Pl. 271, fig. 5.)

4. *L. temuléntum* (Darnel).—*Spikelets* about 6-flowered,

about as long as or shorter than the glume; *florets* awned, or awnless; swollen in fruit; *roots* without barren shoots, annual. In one form the florets have long rigid awns, about as long as the glumella; in the other they have short awns, or none. The stem of this grass is round, rough at the upper part, ereet, two or three feet high, bearing in July a spike sometimes nearly a foot long, composed of rather large spikelets arranged in two rows, on a rough stalk. The leaves are flat, aeute, and rough on the upper side, and the plant would attraet attention by its large size, as well as by being unlike any other of the grasses likely to be found among our eorn. It cannot, however, be called altogether a eommon grass; for though extremely abundant in the eultivated fields of some of our counties, as in those in some parts of Laneashire, where it is a sad annoyance to the farmers, yet it is a local grass quite unknown in many districts.

The Darnel grows among barley, rye, or wheat, and when in the wheat-field it so resembles the corn while as yet but in blade, that the eultivator ean hardly venture to eradicate the weed, lest he should despoil the crop. Our forefathers believed, that in wet summers the wheat degenerated into darnel; and in some retired distriets this notion is still entertained, as well as the equally absurd one that rye, in unfavourable seasons, turns into the Brome-grass, so common in the rye-field. Hence *B. secalínus* reeeived its specific name from *Secale*, the Rye, and was long ealled Smooth Rye. So prevalent was formerly the belief in these ehanges, that Linnæus found it neeessary to write a dissertation in order to refute these opinions. The Darnel is the only grass known, or rather suspeeted, to be poisonous.

There seems no doubt that this plant is the *infelix lolium* of Virgil, for ancient as well as modern botanists attributed poisonous properties to it, and centuries since, laws were made in China, forbidding its use in fermented liquors. If, however, poisonous, it is so only when fermented with the barley malted for beer, or when the bread in the flour of which it is mingled is eaten hot. Some of our best botanists, as well as the great chemists of modern times, like Dr. Taylor and Professor Johnston, believe that it is poisonous under these circumstanees. It is remarkable, however, that neither Pfaff nor our own chemist, Professor Johnston, could, by the nicest tests of the volatile oil yielded by the seeds of Darnel, detect any noxious principle, nor any volatile alkali like the nareotie of tobacco; and some botanists believe, with Professor Lindley, that the noxious properties, thus from generation to generation believed to exist in Darnel, are either altogether imaginary, or that their effects are greatly exaggerated. The symptoms said to arise from eating these seeds are vomiting, staggering, impaired vision, and violent tremors, similar to those experieneed by persons who suffer from disorders eonsequent on the continual use of intoxieating liquors; and instances might be quoted, not alone from old writers, but from recent journals, in whieh cases of this kind are reeorded as having oecurred. Mr. Lowe suggested lately, in a paper read to the Botanie Society of Edinburgh, when referring to the effeets attributed to Darnel, that the virulenee of the plant may depend on the place of its growth, varying aeeording to loeality. Circumstanees of soil or elimate are well known to affeet the degree of poison eontained by a vegetable; thus some umbelliferous plants,

noxious when growing by their native streams, become wholesome by removal to the garden; and the berries of the garden Nightshade (*Solánum nigrum*), so poisonous in our country, form a wholesome dish to the inhabitants of Australia; while the same species of mushroom which, when growing on open land, is wholesome, contains a most pernicious principle if growing by the water-side or in a shady situation. Darnel reared in the Botanic garden, is stated by Mr. Lowe to have produced no effect, when taken in a dose of half an ounce. Much is yet to be learned of the properties of this grass, and it is not impossible that it may be seen that some admixture of a slight portion of ergot of rye, which is well known to cause most dangerous maladies, may have produced effects which have been regarded as resulting from Darnel. Similar errors have prevailed for centuries, uncontradicted by botanist or chemist, as in the case in which a disease called Raphania was supposed to originate in the mingling with flour the seeds of the wild radish, *Ráphanus raphanístrum*, which are now well known to be innoxious.

In some places the Darnel is called Sturdy or Ryle. Its oldest name seems to be Dragge or Drawke, by which it is still commonly called in Norfolk and Suffolk; and the author, on making some inquiries respecting this grass of Kentish farmers, found it generally called Drawke by them. There is good reason for believing that the plant translated "tares" in the Scripture parable of the Sower, is this grass; and in conformity with this view, the French translators of the New Testament render the original word by *ivraie*, from *ivre*, to drink. This word is believed to be the origin of the name of

Rye-grass, given formerly to this species on account of its intoxicating seeds, but now used by agriculturists as the name of the well-known wholesome grasses of the genus. The Darnel is less frequent in Scotland than in England. (Pl. 271, fig. 6.)

40. Leptúrus (Hard-grass).

1. *L. incurvátus* (Sea Hard-grass).—*Spike* cylindrical, slender; *florets* awnless. Annual. In one variety the spike of this grass is curved, in another remarkably slender and erect. This singular little plant, though frequent on the Irish coast, is very rare on those of England and Scotland. It grows on the muddy shores of Devon and Cornwall, near Folkestone in Kent, and on the salt marshes about Dimchurch in the last-named county; while on the muddy shores of the Avon, among the salt-water plants which grow at the foot of St. Vincent's Rocks at Clifton, it occurs in such abundance that its numerous short firm spreading leaves form a good portion of the verdure of many a green patch there; and the author has found it even rising up among the flag-stones of a street, leading up the hill to Clifton, and at some little distance from the shore. The grass is of a pale sea-green colour, sometimes a little tinged with purple, four or five inches high, with its spike more frequently a little curved than quite erect. It is a more singular than attractive plant, for the small florets, wrapped up in the glumes, are completely imbedded in little cavities in the upper part of the grass stem, and require to be looked for ere they are seen, except on some bright sunshiny day, when the eye may be attracted by the little white or yellowish anthers which

1 SEA HARD GRASS.
Lepturus incurvatus

2 EARLY KNAPPIA.
Knappia agrostidea

3 TWIN SPIKED CORD GRASS.
Spartina stricta

4 MANY FLOWERED C. G.
S. alterniflora

5 CREEPING DOGS TOOTH G.
Cynodon dactylon

6 HAIRY FINGER G.
Digitaria sanguinalis

7 GLABROUS C. G.
D. humifusa

seem to hang out of the very stalk. The foliage soon turns yellow. It is a plant very likely to be overlooked, and perhaps is less rare on our shores than is generally believed. It flowers from July to September, and its smooth stem is rather leafy. The oblong seed is shut up in the little hollow of each joint of the rachis, and falls off with it. (Pl. 272, fig. 1.)

41. Knáppia (Knappia).

1. *K. agrostidéa* (Early Knappia).—*Spike* slender; *spikelets* on very short stalks; *glumes* purplish; *glumellas* white, very hairy; *root* fibrous, annual. This is a minute and very rare grass, found in sandy pastures near the sea, in the south of England, Wales, and Ireland. Several stems grow from the same root; they are from one to three inches high, erect, and slender. The leaves are smooth, short, and channelled at the base of the stem. The grass flowers in April and May, the spikelets being either green or purplish. It seems to be found more frequently on the coast of Anglesea than elsewhere. It has also been gathered from the banks of the Thames in Essex. (Pl. 272, fig. 2.)

42. Spartína (Cord-grass).

1. *S. stricta* (Twin-spiked Cord-grass).—*Spikes* two or three, close together, sometimes solitary; *glumes* hairy; *root* creeping and perennial. This rare and remarkably rigid little grass grows in muddy salt marshes on the south and south-east coast of England, as on those near Margate, and is found only on spots near the sea. The stem is smooth, marked with fine lines; the leaves, tapering at the base, are jointed upon the sheath, and but little longer than the spikes. The

stem is from six inches to a foot high, and the plant flowers in July. (Pl. 272, fig. 3.)

2. *S. alterniflóra* (Many-spiked Cord-grass).—*Spikes* numerous; *glumes* polished; *root* fibrous and perennial. This is readily distinguished from the last species, both by its smooth glumes, and also by its leaves, which are not jointed on to the leaf-stalk, but are dilated at the base, and continuous with it. It is much taller than the last, and is an exceedingly rare plant of muddy salt marshes. It was discovered by Dr. Bromfield in 1836, at Itchen Ferry, Southampton. (Pl. 272, fig. 4.)

43. Cýnodon (Dog's-tooth Grass).

1. *C. Dáctylon* (Creeping Dog's-tooth Grass).—*Partial spikes* four or five in a crowded cluster; *glumes* smooth, outer *glumella* longer than the glumes; *root* creeping, rough, and perennial. This rare and singular grass is found on the sandy shore between Penzance and Marazion in Cornwall, where it also grew in the days of John Ray, and it was long thought that this was the only locality for it in this kingdom. It is now known to occur also on some parts of the Devonshire coast, and at Studland in Dorsetshire. The stem is from three to six inches high, creeping at the base, and smooth; the leaves rigid, tapering, and downy beneath, those on the stem mostly folded; and it bears its cluster of spreading, slender, purplish-green spikes, with their numerous spikelets, in July and August.

This grass, though so rare in this country, is abundant in some others. It is remarkable for its power of resisting drought, and flourishes on the driest sands of Egypt. Backhouse found it in great plenty in Van

Diemen's Land, and remarks of it at Paramatta: "The grass lands are green from the abundance of *Cynodon Dáctylon*, which not only abounds in pastures in this country, but takes the place occupied by *Poa annua* in England at the bases of walls, by the sides of footpaths, &c." We have too little of this plant in this country to regard it as of any use, nor is it considered nutritious when compared with the many valuable grasses grouped on our pasture-lands. In Hindostan, however, where there is little herbage for cattle, and where every pasture-grass becomes important, this is highly prized. Dr. Jacob, remarking, in his Flora of Cornwall, that this grass has been clearly ascertained to be the *Dúrvá* or *Dúb* grass of the Hindoos, quotes the observation of Sir William Jones: "Its flowers in their perfect state are among the loveliest objects of the vegetable world, and appear through a lens like minute emeralds and rubies in constant motion from the least breath of air. It is the sweetest and most nutritious grass for cattle, and its usefulness, added to its beauty, induced the Hindoos in their earliest ages to believe that it was the mansion of a beautiful nymph; even the Veda celebrates it, as in the following texts of the *Á t' harvana*: 'May Dúrvá which rose from the waters of Life, which has a hundred roots and a hundred stems, efface a hundred of my sins, and prolong my existence on earth a thousand years.'" (Pl. 272, fig. 5.)

44. Digitária (Finger-grass).

1. *D. sanguinális* (Hairy Finger-grass, or Cock's-foot Finger-grass).—*Stem* creeping at the base; *spikes* from three to five, fingered; *spikelets* in two rows, lower glume

very small; *root* fibrous and annual. This is a rare and not truly a British grass, formerly found growing in fields at Battersea. Its stem is from six to twelve inches long, prostrate and rooting at the base, smooth and marked with fine lines. The leaves are hairy, their sheaths rough, with small tubercles. The grass is of no agricultural use; but Mr. Sinclair remarks of it, that in some parts of Germany it is cultivated for its seeds, which are boiled with milk, and form a palatable dish resembling sago. This grass flowers in July and August; its spikes are purplish-green, but less deeply coloured than those of the next species. (Pl. 272, fig. 6.)

2. *D. humifúsa* (Smooth Finger-grass).—*Spikes* about three or four; *spikelets* in pairs, one on a longer stalk than the other, and more distinctly egg-shaped than in the last; *lower glume* very minute or wanting; *upper glume* downy; *florets* downy; *root* fibrous, annual. This, too, is an introduced plant, found rarely on fields of a loose sandy soil. Its stem is more prostrate than that of the last species, and the spikes are of a deeper purple. Its leaves and sheaths are smooth. Both species are quite unlike any other grass found in this country. (Pl. 272, fig. 7.)

THE END.

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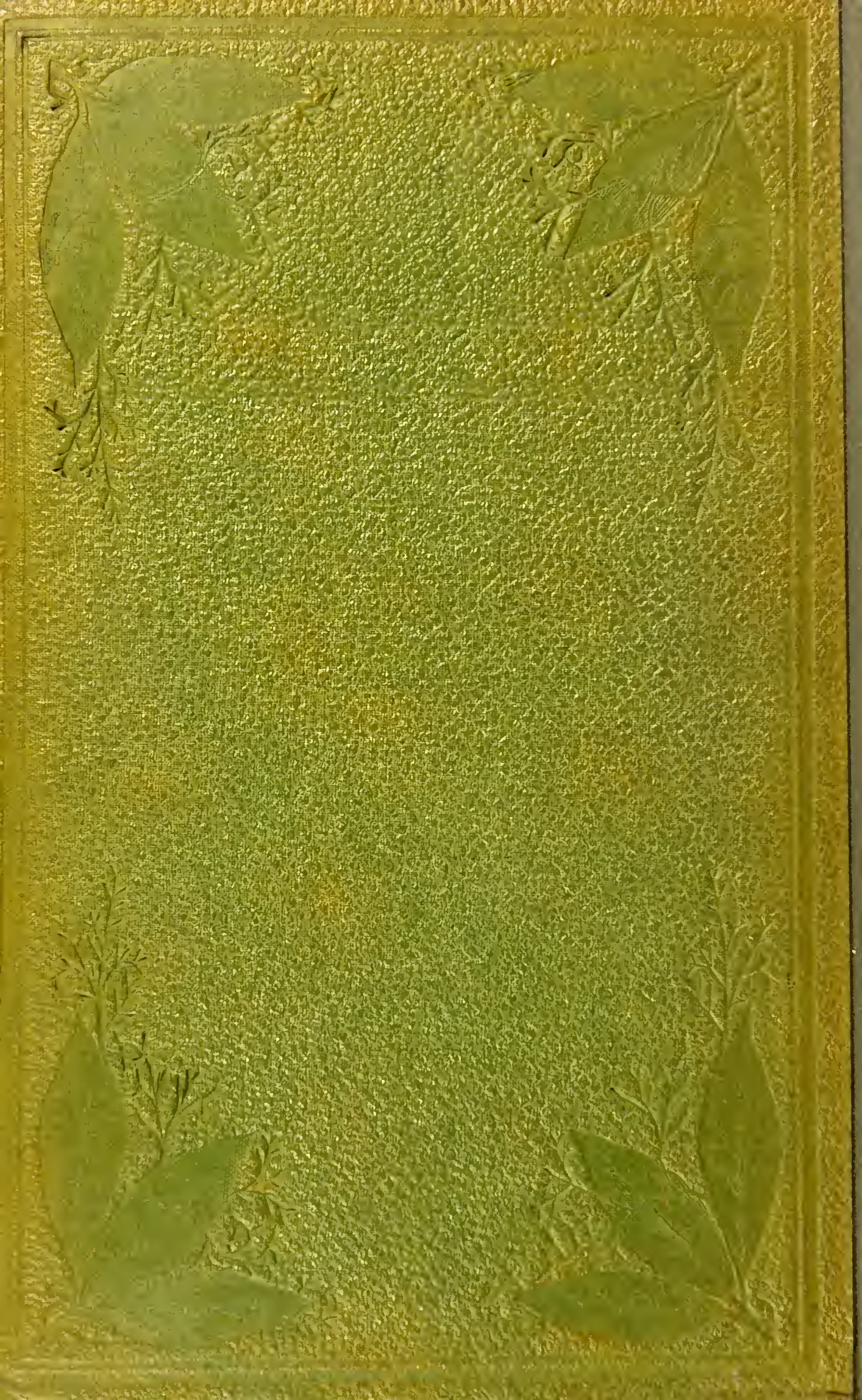
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