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Book III. Mosses.

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T H E

H I S T O R Y

O F

P L A N T S.

P A R T I.

B O O K III.

M O S S E S.

IN the generality of plants the parts of fructification are distinct and obvious: in such, therefore, nothing farther is necessary to the distinguishing them into classes and genera, than an observation of those parts. In the Mosses it is much otherwise; their fructification, notwithstanding all the improvements that have been made in botany in the late ages, is yet but little understood. The several parts that serve to it are not easily discernible; nor is the use of those which we can discover yet ascertained. Linnæus has attempted to arrange them according to these, indeed, in his usual method; but himself confesses, that he is not certain whether what he calls the male parts of the fructification are not the female, and, what he calls the female, the male; and we are to add to this, that almost all the parts of fructification, upon which the distinctions of his method are founded, are wanting in these plants.

Where characters of one kind are deficient to the great end of all characters, distinction, we must have recourse to those of another. We could wish to have been able to distinguish the genera of the Mosses by their fructification alone; but, as there are not characters enough, or, at least, enough are not yet discovered of that kind, we must take in others, from the general habit of the plants.

The Mosses, a very numerous tribe of plants, may be thus divided into Seven Classes, the distinctions of which will be obvious, from the general form of the species; and, under these, the genera may be distinguished by what is obvious of the fructification.

The Seven Classes.

Mosses; Class the First. Such as consist of tender, flexile filaments.

Mosses; Class the Second. Such as consist of a mere foliaceous, or gelatinous matter.

Mosses; Class the Third. Such as consist of firm and rigid stalks.

Mosses; Class the Fourth. Such as consist of a dry, crustaceous matter.

Mosses; Class the Fifth. Such as produce heads with opercula to them.

Mosses; Class the Sixth. Such as produce capsules without these opercula.

Mosses; Class the Seventh. Such as consist of a foliaceous matter, with pedicles arising from it.

M O S S E S.

*Class the First.**Such as consist only of tender, flexile filaments.**Genus the First.*

B Y S S U S.

BYSSUS is a genus of Mosses, consisting of plain, simple, capillary fibres. No part of fructification has yet been distinguished in this Moss. Its filaments are uniform, and are often so fine as to be scarce discernible singly, though, in the cluster, they make a kind of fine down.

There has been a long dispute among the botanists, whether the Byssus were properly a Moss or a Fungus. Linnæus is of the latter opinion, most of the other botanists of the former. Dillenius thinks it is of a middle nature between both. Authors have been used to include two very different things under the name of Byssus; the one, the filamentose bodies we include under this name; the other, the dusty matter found on putrified vegetables. Dillenius has described many of these with the others, and Linnæus, who takes in the aspergillus and botrytes of Micheli into his genus of the Byssus, does the same. This, however, is confounding things; and from this, probably, arose the difficulty of ascertaining to what class of plants the Byssus belonged. The filamentose bodies, called by authors Byssi, are truly Mosses, of the nature of the conservæ, and other filamentose plants of this class; but the pulverulent kinds, or such as consist of globules, whether with or without pedicles, are all true and proper fungi, and have been described by us as such in their proper place. One would wonder what should induce botanists of such eminence as these to arrange things so very different under the same genus. Dillenius, indeed, rejects the botrytæ and aspergilli of Micheli from among the Byssi, though he retains some others there which evidently belong to the same family. His observation, however, that there would be no end of describing them, because they are of different forms, according to the nature of the putrifying matter they arise from, has but little of the botanist, or of the philosopher, in it.

The great distinction between the Byssi and conservæ is, that the former do not grow in the water, as the latter all do, and that they consist of finer, shorter, and more tender filaments. The Byssus, upon the whole, is a genus of plants that carries the least appearance of a vegetable nature in it of any known one. Dillenius, the most accurate of all writers on the Mosses, has described fifteen species of Byssus, properly so called. His whole number of plants under this name is twenty, but the first five of these are of the number of the fungus's, of the genus of the aspergilli. We have met with two other species of true Byssi, beside those described by Dillenius, which makes the whole number of Byssi known at this time seventeen.

We shall describe three of the more singular species of these at large; after which, the names will be sufficient to distinguish the rest.

1. *Byssus simplex tenuis, areolaris.**The fine, simple, areolar Byssus.*

This elegant little Moss grows in little clusters, or areolæ, usually of a circular figure. These seldom exceed a sixth of an inch in diameter, but there usually grow a considerable number of them near one another, so that it is easily distinguished at a distance. These clusters are composed of multitudes of extremely fine filaments, perfectly simple and uniform in their structure, scarce a twentieth part of an inch in length, but all perfectly erect, and of the same thickness from the base to the point. These filaments are of a pale-amethystine colour, or of a mixture of white and purple.

After the plant has passed a certain time in this form, the filaments all fall down, and, intangling with one another, they form a kind of membrane, covering the little spot upon which it first stood erect, with a thin crust. This becomes, in a little time,

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of a deeper purple, and, in fine, of a violet colour, and is even blackish, before it drops off.

It grows on the barks of trees, and, sometimes, on the stalks of the larger mosses. It appears in it's perfect or filamentose state in November and December; after which, it remains till the end of February in it's second form. Dillenius has described this under the name of *Byssus lanuginosa*, violacea, lignis adnascens, both in his History of Mosses, and in his edition of Ray's Synopsis of the British Plants. Micheli has described it twice, under two different names; first, under that of *Byssus purpurea*, elegantissima, arborum caudicibus adnascens brevissimis ac tenuissimis filamentis; and again, under that of *Byssus minima*, cærulea, non ramosa, musco innascens.

I have observed it both on the stumps of trees and on the damp stalks of the great hypnum in Hornsey-wood, and have found it from the palest purple to the deepest blue on both. It's different appearance also, in it's second state, has misled some into the taking it for a kind of agaric. Doody has described it under the name of *Fungus violaceus*, herpetis modo lignis irrepens; and Mr Ray, under that name, both in his Synopsis and his History.

2. *Byssus summitatibus barbatis.*

The bearded, topped Byssus.

This is a considerably larger and more robust plant than the former. It grows in irregular clusters, an inch or two in breadth, sometimes considerably more, and consists of filaments of the thickness of a human hair, and of near two inches in length. These stand erect, their number rendering them a support to one another. They are of an equal thickness throughout, and of a simple, uniform structure; but, at their tops, they divide each into a great number of very delicate and slender filaments, twenty, thirty, or more, in number to each, which form a little brush, or beard, at the top of every filament, of about an eighth of an inch in length, and nearly as much in breadth. The superficies of the whole cluster is, by this means, rendered beautifully tomentose, or, as it were, downy.

The first appearance this little plant makes is very different from this of it's perfect state. It consists, while young, of a number of strait, short, uniform fibres, arranged so closely and uniformly together, that their surface resembles the nap of a piece of velvet. The plant is, at this time, of a pale orange colour. When full grown, it is of a deep orange colour, with more red in it, and is flexile and tough, and the several filaments have sometimes a kind of annular marks, in two or three places, which seem to denote three or four different periods of growth. It has no remarkable smell, but a subastringent taste.

It grows on the rotten stumps of trees, and sometimes on old boards. I have met with it very perfect and fine in January, in the woods about Harrow. Micheli seems to have meant this species by the name of *Byssus major*, speluncis et cellis vinariis innascens, latissima, primum alba, dein aurea, postea fulva, filamentis crassioribus et longioribus fissilibus, in his Nova Genera Plantarum; but, if so, he was not acquainted with it in it's most perfect state. Some have supposed it to be the *Fungus Virginianus*, barbatus, foetidus, Banisteri of Plukenet; but the want of smell alone is enough to distinguish it from that plant, which seems rather to be the fungus barbatus, quercinus, teterimi odoris of Breynius, Eph. Germ. Dec. 1. Mr Doody evidently meant it, by the inartificial name of *Pseudospongia fungoides*, fulva, lignis adnascens, in the Appendix to the second edition of Ray's Synopsis of English Plants; and Dillenius, in the third edition of that work, and since, in his *Historia Muscorum*, has described it under the name of *Byssus arborea*, barbata, fulvi coloris.

3. *Byssus ramosa extremitatibus capillaceis.*

The branched Byssus, with capillaceous extremities.

This is by much the most elegant of all the species of this genus. There arise from the same base six, eight, or ten stalks, which are of a flexile and somewhat tough texture, and of a whitish yellowish, or dusky colour. They are somewhat flattish in form, and of the composite kind, dividing, as they grow in length, into a multitude of other small branches, and these all send out shorter and smaller shoots on each side, at small distances. The whole plant grows to three or four inches in length, in the larger

larger specimens; but, in many, it does not exceed half an inch. It always spreads out as much in breadth, or more, than it does in length, and the extremities of all the branches and shoots terminate in a sort of broad and delicate filamentose expansions: in some of these the filaments are perfectly distinct, and wonderfully fine; in others they coalesce, and form a thin and seemingly membranous substance; but these latter I have often observed, after a time, to open into the state of the former, the fibres separating themselves, as they grow drier. The branches sometimes rise naked from the matter they grow to; sometimes they have a kind of base of the same substance with their own, out of which they arise. Its branches do not stand erect, as the filaments of the other Byssi in general do, but extend themselves upon the substance they grow on, adhering every-where very firmly to it.

It grows sometimes on old stumps of trees, oftener on rotten wood in cellars, and, sometimes, on the decayed leaves of plants and trees, and a great variety of other substances. When it has sufficient moisture, it is usually of a pure snow-white colour; where it has less, it is yellowish, or livid, and smaller. It is principally found in winter. I have met with very fine specimens of it on decayed oak-leaves, in Cane-wood, near Highgate, in December. Dillenius has described and figured it, both in the third edition of Ray's Synopsis, and in his own History of Mosses, under the name of *Byssus tenerrime villosa et elegantissime ramulosa*.

Of these three singular species of Byssi, the two latter have scarce any others like them, the generality of the others being composed of simple, strait filaments, and differing principally in their length and colour. They are, 1. A short, green kind. 2. A complicated, purple kind, found on the bay-tree. 3. A flaky, snow-white one, found in cellars. 4. A short, yellowish kind, with a membranaceous base. 5. The black, silky Byssus of Micheli. 6. A yellowish kind, looking like coarse cloth. 7. A fine green one, lying on the ground, and resembling velvet. 8. A yellow, globular kind, growing on boards. 9. An orange-coloured, hair-like kind. 10. A black hair-like kind. 11. A short, setaceous, white kind: and, 12. A tough, complex kind, of a dusky, blackish-green colour, found in great plenty on our wine-casks. To these, which are all the kinds of genuine Byssus described by authors, we are to add the two new species of our own. The first of these is a small grey one, with round branches, more divaricated than any of these kinds: the other, a bearded one, like the second species described here, but shorter, thicker, and divided into fewer filaments at the extremities: both these I found on Mendip-hills, growing near the bottom of the stumps of old trees.

Our wine-coopers have a custom of using the twelfth species to stop the bleeding of fresh wounds, which purpose it answers very well: excepting this, we do not find that the Byssi have been put to any use in medicine.

M O S S E S.

Class the First Genus the Second.

C O N F E R V A.

CONFERVA is a genus of Mosses, consisting of oblong, capillary filaments, not uniform and equal throughout their whole length, but divided into joints of a cylindric or globular figure.

The Confervæ all of them grow in water; we have nothing whose place of growth is out of the water, that is at all like them. Their filaments are sometimes simple, sometimes branched, and are often extended to a great length; but no part of fructification has ever yet been discovered in any of them.

It has been a common error of botanical writers to confound the cylindric and tubular ulvæ of the slenderer kinds with the Confervæ, but the distinction is obvious: length and slenderness are not the generical characters of the Conferva, but its geniculated or nodose structure; every plant which wants this character is to be removed from the class of Confervæ, and consequently all those plants, called by Dillenius, Ray, and others, *Confervæ simplices et equabilli filo protensæ*, are to be excluded this class; they will be found among the cylindric ulvæ.

Boccone delivers it as his opinion, that the *Confervæ* have in reality no fructification at all: that they do not arise from seeds as other plants, but are formed of an unctuous matter, separated from the water by mere juxtaposition of parts. Dillenius favours the same opinion, and argues, that, as they are plants of a lower class than others, and approach more than any to the nature of fossils, they may probably be formed as they are. There needs no farther answer to so unwarrantable a supposition as this, than to observe that it's original author Boccone extends it to the Fungi as well as the *Confervæ*. We have already discovered flowers and seeds in these last, and may probably, at some future time, in the former.

Dillenius, in his History of the Mosses, has described no less than forty-eight species of *Conferva*; one half of that number, however, is struck off at once, by observing that the first twenty-four are of that kind called *Simplices et non geniculatæ*, and therefore are properly *ulvæ*.

As to the remaining half, after descriptions at large of three of the more singular species, a jointed simple one, a ramose jointed one, and a globular branched one, it will be sufficient to distinguish the rest of them by their names.

1. *Conferva geniculata simplex*.

Simple, geniculated Conferva.

This is a very singular plant, and is easily distinguishable at sight. It consists only of a single filament of a cylindric figure, and of the thickness of a large horse-hair of an equal bigness throughout the whole length, but divided by annular marks into a multitude of short joints, of the figure of segments of cylinders. It has no root, nor does it adhere to any thing in it's usual manner of growth, but floats loose in the water usually, at a middle depth, between the surface and the bottom. It's colour is a faint yellow, with an admixture of green, while in the water, but, when dried, it becomes whitish. Several of the filaments are usually found together, variously entangled, and making loose knots; if carefully explicated, however, they are found to be of a surprising length: I have measured some of five feet and a half, and these not entire neither; they are tender, and easily broken. It grows not only in salt but in fresh water. I have met with it abundantly in the ditches below Greenwich; and in the river Nen below Peterborough there is no angling without frequently taking it out; it is usually thicker, and somewhat stronger, in salt water, but in fresh rivers it grows to a surprising length: in the river just mentioned, when the water is clear, it is common to see complicated congeries of it of half a yard in diameter, from which single filaments of a vast length may be explicated, while the whole is in the water; but, if taken out, it collapses, and the separate filaments cannot be pulled out to any great length. Scarce any of the botanical writers have missed this obvious plant.

Imperatus calls it, *Linum aquaticum*; and Chabræus, *Fucus capillaria dictus*. Ray calls it, *Filum marinum Anglicum*, five *Conferva palustris*; and Tournefort, in his Elements, *Alga sublutea capillaceo folio*. Micheli calls it, *Corallina marina, setacea, nodosa, viridis*; and Dillenius in his History, *Conferva filamentis longis, geniculatis, simplicibus*. It is obvious, from the different generical names under which we meet with this in the greatest authors, how much a regular distribution of these plants into genera has been wanted.

2. *Conferva geniculata, ramosa, plumea*.

The branched and feathered geniculated Conferva.

This is a *Conferva* of the smaller kind, but it is an extremely elegant one. It grows to two, sometimes to three inches in length, and is usually affixed to some small pebble, or other the like substance, at it's base. Four, five, or more stalks usually rise from the same base, and, while in the water, they spread themselves so as to make a kind of roundish tuft of a very pretty appearance. Every stalk is a geniculated filament of a cylindric figure toward the base, but growing smaller near the top; almost immediately from the root, it sends out lateral branches, which grow to an inch or two in length, and these, as well as the main stalk, which toward the top is scarce distinguishable from them, are terminated by clusters of small and elegant filaments, twenty or more in each cluster, all of the same colour with the main branch, and all geniculated in the same manner. From the sides of the main stalk, and of the

branches also all the way up, there grow little tufts of the same filaments, about a sixth of an inch long, and perfectly like those which terminate the stalks; so that the whole plant, seen in the water, looks like a tuft of an extremely fine filamentose matter, the branches being all hid by these fine pencils. The colour of the whole plant is a deep but not unpleasant green; its surface, when dry, looks glossy, and is less tender than many of the other *Conservæ*: it grows only in fresh waters. The trout-rivers near Rickmansworth afford a great deal of it. I have also met with it plentifully in Wiltshire. Micheli found it in some rivers in Italy; and Dillenius received his specimen of it from the late Mr Brecon, who found it in Munnow river in Herefordshire.

Many of the botanical writers have described it. Plukenet calls it, *Corallina geniculata, mollis, internodiis brevioribus*; and Micheli, *Corallina fluviatilis, nodosa, capillacea, viridis, minima, serici modo lucens*. Dillenius describes it under the name of *Conserva fluviatilis, sericea, tenuis*, but imperfectly, having never seen it growing, as he confesses; but having formed his description on a dried specimen, which could convey but a very imperfect idea of the plant. Barrelier has an elegant figure of a plant, which he calls *Corallina cristata minima*, which in all respects agrees with this; but the author tells us, that it is white, or pale red, or purplish in colour: ours is always green, and does not lose that colour, even in drying.

3. *Conserva nodosa, ramosa, æqualis.* The branched, even, knotty *Conserva*.

This singular and elegant *Conserva* rises usually single from its base, where it is affixed to some pebble, or other solid body, at the bottom of the water. Its stalk begins almost immediately from the base, however, to divide itself into a number of branches, and these, as they ascend, ramify and branch themselves out still farther, so that it forms, in the whole, an extremely divaricated plant, of about three inches high sometimes, but rarely, more. If it grow in clear water, where there are no other plants, it spreads out in a very beautiful manner a single stalk of it, not thicker than a small twine, branching into an extent of three inches every way in diameter, every part of which is well covered with the extremities of the filaments: if it happen to grow where there are other water plants, it usually entangles itself about them, and loses much of its beauty, while in the water. It is singular in this species, that the branches continue equal in thickness, till very near their extremities. They are of a very beautiful structure, seeming composed of a multitude of globular bodies, all of the same size, and arranged as closely and evenly in series as possible. Its colour is a fine bluish purple: it is tender, and easily destroyed, and is of a glossy surface, and somewhat gelatinous to the touch.

It is an inhabitant of the fresh waters, and principally of the cold clear ones which form the lakes on our mountains. I met with it two or three times in Yorkshire; and it is also found in Wales, but we do not find that it has been met with any where out of the British dominions, though so very elegant a species, that, if it occurred in other places, it is scarce to be suspected that it would be overlooked. Dillenius describes it under the name of *Conserva Alpina, lubrica, filamentis nodosis cæruleis*.

Of the other species of *Conserva*, some are of the geniculated, some of the nodose kind; they are some of them found in our fresh waters, but the largest part of them are inhabitants of the sea. Of the first kind or geniculated *Conservæ* there are, 1. A green kind, branched, but with short ramifications. 2. A kind, with remarkably long joints. 3. One with branched extremities, called the river Beard. 4. A branched, marine kind, known by the name of the Sea-beard. 5. A more diffused one, called the Spreading Sea-beard. 6. A very ramose, fresh-water one, growing in round tufts. 7. A fine-branched, or woolly sea-kind. 8. A silky, trichoid kind. 9. The palmated sea-kind. 10. The large, gelatinous sea-kind. 11. The fine-branched, gelatinous sea-kind. 12. A very-much branched, small sea-kind. 13. The hollow, Sea-*Conserva*.

Of the nodose kinds there are, 1. A lubricous, pearly, Sea-*Conserva*. 2. A slippery, coralloide Sea-*Conserva*. 3. The large frog-spawn *Conserva*. 4. The smaller frog-spawn *Conserva*. 5. The tender, green, frog-spawn *Conserva*. 6. The black, lubricous *Conserva*. 7. The horse-tail, river *Conserva*. 8. The sea horse-tail *Conserva*.

The

The ancients recommend the *Conservæ*, in general, as vulneraries, externally applied; and Pliny tells us some romantic stories of the use of them in cases of fractured bones. At present we do not bring them into use at all; and it is most probable, that, in the times of the authors who mention them as vulneraries, they were used by the surgical people rather as bandages, than from an opinion of any peculiar virtue they possessed against wounds or fractures; several of the species, when lightly twisted together, make a very soft, and sufficiently strong, substance for such purposes as we suppose them to have been used for.

M O S S E S.

Class the Second.

Such as consist of a mere foliaceous or gelatinous matter.

Genus the First.

P H Y L L O N A.

PHYLLONA is a genus of Mosses, consisting only of a thin membranaceous matter, resembling in some measure a leaf; of an uniform and even structure, pellucid and moderately firm. No part of fructification has yet been discovered in any species of this genus.

The botanical writers, in general, have confounded three different genera of Mosses, of which the Phyllona is one under the same common name; some of them have called them *Ulvæ*, others *tremellæ*. The first of these genera consists of a simple, foliaceous matter; the second, of tubular, cylindric bodies, formed of the same kind of matter; and the third, of a merely gelatinous substance. We have, to prevent future confusion, separated the first and last of these under new generical names; the second we have retained the term *ulva* as a generical name for, to avoid a third new one, in a case where Linnaeus had already appropriated a word to the same idea. The first of these genera takes in the foliaceous *ulvæ* and *tremellæ* of Dillenius, &c. The second, the tubular *tremellæ* of these authors, and all the simple or equable *conservæ*; and the third, some vegetables all evidently of the same kind, though distinguished by authors under the various names of *Fuci*, *Corallinae*, and *Algæ*.

There are properly no more than six species of the Phyllona known at this time. A description of one of them will be sufficient: the rest will easily be distinguished by their names.

1. *Phyllona umbilicata.* *Umbilicated Phyllona.*

This is much more regular in its growth and general form than the others of this species: it grows to a stone or shell, or any other solid matter, at the bottom of the sea, by a small roundish base, scarce a quarter of an inch in diameter in the most elegant specimens, in some much larger. From this base or umbilicus it expands every way, till it has formed a sort of basin or roundish hollow body: The base serves as the umbilicus to this general figure, and is the lowest part of it. The whole consists of a single continuous substance, undulated or irregularly sinuated at the edges, very thin, and resembling, more than any thing else, a very fine parchment. Its colour is a dusky brown, with some tinge of purplish in it; its substance much resembles that of the common oyster-green, but that it is firmer; and its surface is smooth and glossy. It grows to four or five inches in diameter, but is seldom met with perfect, the sand and other bodies washed against it tearing it to pieces.

It is not uncommon about our own shores, particularly those of Kent and Sussex, and, when entire, makes a very beautiful figure.

Most of the botanical writers have described this species; but, as they have taken more notice of its colour, than of its form and texture, they give but very imperfect accounts of it. Lobel calls it, *Lichen marinus rubescens et flavescens*; and John Bauhine and Chabréus give it under the same name; but the figures, as well as descriptions of these authors, shew that they had only met with small or broken specimens.

Ray

Ray and Morison both describe it under the names of *Fucus lichenis facie marinus*. The Scotch who eat it call it *Slake*. Tabernamontanus seems to mean this species by the *Lactuca marina*, which he figures as the common one; but his description is too short to form any certain judgment from it. Imperatus describes it under the name of *Umbilicus marinus*, and Morison and Ray, under those of *Fucus marinus umbilicatus*, and *Fucus, umbilicus marinus dictus*.

The other five species are, 1. The common oyster-green, or laver. 2. The small *Phyllona* of our fresh water. 3. The oblong, verrucated *Phyllona*. 4. The oblong, smooth *Phyllona*; and 5. The linze, or fasciated *Phyllona*. All these are of the same tender texture with the common oyster-green, and all are inhabitants of the sea, except the second: they usually grow by a small base to stones, and other solid bodies, near the shores.

M O S S E S.

Class the Second. Genus the Second.

U L V A.

ULVA is a genus of Mosses, consisting of a merely foliaceous matter, formed into oblong, cylindric tubes. These tubes are sometimes plain, sometimes wrinkled. They usually grow to a great length, and are of various diameters, but no part of fructification has ever yet been discovered in any of them.

This genus, as it includes what are called the tubular tremellæ, and with them all the smooth confervæ of authors, is considerably abundant in the number of it's species. They have all, however, so general an external likeness, that, after giving descriptions of two or three of them, we may very safely leave the rest to be distinguished by their several names.

1. *Ulva longa, tenuis, simplex.*

Long, fine, undivided Ulva.

This plant consists merely of long, cylindric, capillary filaments; there grow several of them from the same base, fifty, a hundred, or more, from whence they extend themselves to six, eight, or ten feet; they are of an equal thickness, or very nearly so, all the way, and are hollow, being composed of a thin tubular membrane, easily broken, of a deep green colour, and of a glossy surface. These filaments are always simple, never so much as a single ramification growing from them; they generally adhere at the base to a stone, sometimes to a piece of board. Their common place of growth is in the clearer running waters, where they follow the course of the stream, extending their filaments to a surprising length.

This plant is described by all the botanical writers, but under various names: the generality have called it *Conferva vulgaris*, and supposed it the conferva of Pliny, which, he says, grows upon stones in the brooks on mountains, and is hair-like, and hollow. There are not wanting authors who deny a hollowness to this and the other confervæ, as they call them, of these simple and equable kinds; but it is owing to their imperfect observation of them; either they have not used the proper assistances in the examination, or else they have examined them at an improper time. When out of the water, the sides of the tube are apt to collapse and form a flat, solid body, and at certain periods of growth the cavity also fills up by nature, or at least grows too small to be discernible; but whoever will examine the confervæ, with the help of a glass in water, when at their full growth, and in their most perfect state, will find a very manifest cavity in all of them: most he will find mere, thin, membranous tubes. Lobel has figured this species under the name of *Conferva Plinii*; and Gerard, Parkinson, Chabræus, and a great many others, who have given figures of it, have evidently only borrowed this of Lobel's. Aldrovand has indeed given a figure of his own of it, and has copied a description from Pliny: it is pretty clear, that he never saw the plant; so that 'tis easy to guess what information is to be had from him. Micheli has given a new figure of it, and refers it to the *Byssi*, whither also we should have referred it, if, as authors, in general, have related, it's filaments were solid, and not

not tubular. Authors describe several conservæ, as they call them, which grow on land, and consist of solid filaments; all these we refer to the Byssi: but the tubular ones, which are all of them inhabitants of the water only, are to be referred to this genus, though at present divided by authors; among many others, Tournefort calls this species *Alga fluviatilis*, graminea, longissimo folio. Boerhaave, *Muscus aquaticus* conservæ dictus; and Bromelius, *Fucus capillaceo folio*. We meet with it also in the very best authors, who have written largely on these subjects, described many times over, in it's different states, under various names, with conservæ at the head of them: It is only in running waters that it can extend itself, as described here: these are it's proper place of growth, but it is often met with also in standing waters, and sometimes in foul puddles: in large and clear ponds it diffuses itself every way, and seldom extends to a greater length than ten or twelve inches, in foul and shallow puddles; it often does not grow to more than two or three inches, and stands erect. In both these and many other appearances of the same kind the plant is wholly the same, though it is not under exactly the same form.

2. *Ulva ramosa, subrigida, brevis.*

Short, rigid, branched Ulva.

This is a plant of considerable beauty in it's divisions, and while in the water, with it's ramifications all extended, makes a very pleasing figure. It grows to three or four inches in length, sometimes it is much less, rarely more. It rises from a small flat base, fixed on some pebble, or other solid substance, and from a single stem divaricates into a multitude of parts, each of which sends off a number of lateral branches, all dividing into still smaller, till, at the extremities, they become almost imperceptible. Sometimes only one main stem arises from the base; sometimes two, three, or four, in which case it is less distinct, but extends farther. It's colour is a dusky green; it's larger branches have a cavity in them pretty large, in the smaller it is less perceptible: it is of a finer structure than most of the other *Ulvæ*, and less flexible. It grows in rivulets, brooks, and other running waters, and is frequent enough in many parts of England. Several of the botanical writers have mentioned it, under the name of *Conservæ fluviatilis fibrillosa*.

3. *Ulva sinuosa simplex.*

Simple, sinuous Ulva.

This is an extremely singular species, and is so different in it's figure and size, according to it's time of growth, and the water it is in, that it might easily lead people into an opinion of it's being, under these several states, several different plants. It is usually simple, but sometimes it divides into a few ramifications. When full grown, it is of the thickness of a sheep's gut, and of three, four, or five feet in length. It is at this time a mere membranaceous tube; the membrane itself is not thicker than a fine paper, and it's cavity such as will admit a man's finger: the cavity of the smaller species may be better understood by that of this large one, than by any examination of themselves; for they appear to be all alike in this respect, it is continued through the whole plant, and has no valves, or any thing to intercept it. The surface of the tube is full of wrinkles and sinuosities, very deep, and very irregular; the membrane it consists of is very tender, and is at first of a yellowish colour, afterwards greener, and sometimes brownish: while young, it is less sinuous; and, as it grows, if it have plenty of water, and that of a proper degree of saltness, it will run into a multitude of luxuriant figures. It is common in salt water ditches, and about the sea-shore in some places. We have it in great plenty in the ditches about Greenwich and Woolwich, where it grows to a vast length. It is naturally affixed at the base to a stone, or to some other solid body; but it frequently breaks off, and the greatest quantities of it are found floating loose on the surface of the water. It is most frequent in salt waters, and then grows most luxuriant; but it is not wanting in our fresh ones. Mr Brown met with it in Shropshire, and I have seen it in the ponds in Wiltshire, in many places.

It is so singular a plant, that scarce any of the botanical writers have missed it, but they have described it under many different generical names. Tournefort and the Bauhines make it a fucus; they call it *Fucus cavus*, and *Fucus tubulosus*. Imperatus calls it *Cava*; Ray, *Lactuca marina tubulosa*; Plukenet, *Lichen fluitans tubulosus*; Buxbaum, *Conferva latifolia, flavescens, intus cava*; and Linnæus, *Ulva tubulosa simplex*: our common people call it the Sea Chitterling.

As to the other species of the *Ulva*, it is not easy to ascertain them: nothing is more certain than that, in this genus, the same species, in it's different states, has been described frequently for several different ones. What seem most evidently and indisputably different species, are, 1. of the *conferva* kind, as they are called: there are, 1. The small, byssus-like *Ulva*. 2. The forked *Ulva*. 3. The white, silky *Ulva*. 4. The fennel-like *Sea-Ulva*. 5. The forked, bristly *Ulva*. 6. The ditch, hairy *Ulva*. 7. The cottony *Ulva*. 8. The flocky *Ulva*. 9. The reticulated, fine *Ulva*. 10. The spongy *Ulva*. 11. The short, divaricated *Ulva*. 12. The cancellated *Ulva*. 13. The feathered *Ulva*.

2. Of those called *Tremellæ* by authors there are, 1. The bladder-headed Laver, or *Ulva*, described by Dillenius; and, 2. A short, smooth, and thick kind, consisting of a much tougher membrane than the rest, which I have met with about Bognor Rocks in Suffex.

Let it not appear singular that, in this distribution of the Mosses, we have allowed no such genus as the smooth *Confervæ*, so many species of which are described by authors. There can be no such genus, since a Moss composed of tender and smooth filaments, if those filaments are solid, is a byssus; if they are hollow, it is an *Ulva*. The species described by authors, under the names of *Confervæ simplices*, and *equabiles*, are partly of the one, partly of the other of these genera; the land kinds are, in general, byssi, and their names are given, at the end of our account of that genus; the water ones are *Ulvæ*, and mentioned among the first series here.

M O S S E S.

Class the Second. Genus the Third.

COLLEMA.

COLLEMA is a genus of Mosses, consisting merely of a gelatinous matter, resembling boiled glue, or size.

This is sometimes disposed in form of filaments, sometimes of membranes, sometimes of neither, but perfectly shapeless. No part of fructification has ever yet been distinguished in any of the species of this genus.

Authors who have written on these subjects have been acquainted with many of the species, but, as no generical character has before been established for them, they have arranged them among the *Confervæ*, *Ulvæ*, *Tremellæ*, and *Lichenoides*, though it is evident that they have not the characters of any one of those genera. Where the only obvious character, indeed almost the only character, of a set of plants appears in their texture, it must be allowed us to take the generical character from that. As to the class they belong to, it is evidently that of the tender, foliaceous Mosses, as their whole substance seems no other than a distended matter of the same kind, and, in all of them, dries up to a membranous substance, wholly like what others naturally exhibit. We shall here, according to our custom on the other occasions of this kind, describe four or five of the species at large, after which the others will be easily distinguished by their names.

1. *Collema filamentosum crassius.*

Thick, filamentous Collema.

This is an aquatic species. It extends itself in form of a thick, gelatinous matter, over stones, and other solid bodies, in our clear brooks and rivulets. The masses of it are three, four, or more inches in diameter, and of half an inch frequently in thickness. It is extremely lubricous to the touch, and is so tough as not to be easily broken to pieces. It's colour is a deep dusky purple. It appears, at first sight, a mere mass of

of jelly, but, when more nearly examined, it is found to be composed of a multitude of long, cylindric filaments, of a mucous, or gelatinous substance, interwoven with one another in various directions, and laid so close every-where, as to join, and, together, to form this seemingly rude mass of jelly. Such is the condition of this Collema, when in it's recent and fresh state; when dried, it becomes a thin membrane, like parchment, of a fine, deep, violet purple; and the cylindric filaments it is composed of are then very distinctly visible; they are slender, every-where of the same diameter, and perfectly resemble those of the byssi and finer ulvæ.

I have met with it in some of our trout rivers in Buckinghamshire, where it renders the stones so slippery, that, if the necessities of the sport lead people a little way into the water, there is no standing upon them. It is also found in the brooks among the Welch mountains.

Some of the botanical writers have mentioned this. Dillenius makes it a conservæ, and gives a tolerably perfect description of it, under the name of *Conservæ mucosa*, *confragosis rivulis innascens*.

2. *Collema filamentosum tenuius.*

The thinner, filamentose Collema.

This is a species of which the naturalist can preserve no specimen. It is scarce possible to take it up out of the water, without destroying it, and wholly impossible to make it retain any thing of it's form, in drying.

It grows in small and roundish clusters, or globules, at the bottom of standing waters, and consists of a multitude of ramose filaments, of a tender, gelatinous matter, which intersect one another in many places, and every-where cohere so as to form, in the whole, a mass of an uniform, gelatinous structure. It's colour is a dusky green, with an admixture of brown; it's texture so extremely tender, that it falls to pieces on almost the least touch, and, if attempted to be dried with the utmost care, it only leaves a small, thin, and shapeless membrane. It grows to the mud at the bottom of still waters, and often in such quantities, as to cover almost the whole surface of it. It is very frequent about towns where the filth continually washed into the ditches fills them with a light and loose rich mud.

The botanical writers have not missed this; and the appearance of fibres in it's texture has made them range it among the conservæ. Ray calls it *Conservæ gelatinosa*, *omnium tenerrima et minima, aquarum limo innascens*; and Dillenius has described it, under the same name, in his History of Mosses. It is either peculiar to England, or, to the credit of the English botanists, it is a plant overlooked by those of all other nations.

3. *Collema dichotomum.*

The dichotomous Collema.

This is not only the most beautiful of the whole genus of the Collema, but is one of the elegantest of the whole tribe of Mosses. It grows to the length of three or four inches, and it's thickness, in the largest part, is that of a small packthread. It adheres to some pebble, or other solid substance, at the base, and rises with a single stem, which soon divaricates into two, each of those into two more, and each of these subdivisions separate again and again in the same manner, till, at the extremity, there are often fifty, sixty, or more branches. It is, throughout, of an elegantly-jointed structure: the joints are oblong, and somewhat larger at their tops than at their bases, so that it resembles the structure of some of the corallines in appearance. The whole consists of a gelatinous substance, so soft that it is easily destroyed in handling. It's colour is a pale purple, sometimes whitish. It is difficult to take it up entire; but, if dried, it becomes an extremely thin and transparent membrane, adhering very firmly to the paper by it's own glutinous quality.

It is a marine plant, and is not uncommon about our own shores. I have met with it very frequently about the Island of Sheppey, and once on the Bognor Rocks in Sussex.

It has been described by some of the botanical writers under the name of a *Conservæ*, and, by others, under that of a *Coralline*. Dillenius calls it *Conservæ marina gelatinosa*, *corallinae instar geniculata, crassior*; and Kempfer, *Muscus marinus, corallinae similis, multifidus, folio tenuissimo*.

4. *Collema*

4. *Collema compressum*.
Flatted *Collema*.

This is a species extremely different from all the former in it's configuration. It consists of a number of branches, or ramifications, arising from one common base: these grow in all directions, and usually form, upon the whole, a figure approaching to circular. They are of the same gelatinous and tender substance with the rest of the plants of this species; and, near the base, where they stand close, they cohere and run together so as to form a confused, gelatinous mass, of the breadth of an inch, or more, and nearly of the third of an inch in thickness. From the edges of this, the branches run to half an inch, or thereabout, in length, and are variously divaricated and thick, but flattish. The colour of the whole is green, and it's substance that of a stiff jelly. It grows to posts and old boards, under water, in salt ditches. I have met with it in Canvy Island in Essex abundantly. The botanical writers have some of them described this, but under the odd generical names of a fucus, a conferva, and a tremella. The late Dr Manningham, who seems to have been the first that discovered it with us, called it *Conferva gelatinosa, damæ cornua representans*; and, under that name, it stands in Ray's Synopsis of British Plants. Vaillant calls it *Fucus fontanus, pinguis, corniculatus, viridis*; and Dillenius retains Dr Manningham's name, only that he changes the generical term from *Conferva* to *Tremella*.

5. *Collema sinuosa fugax*.
Sinuous, fugacious *Collema*.

This is the least permanent of all the species of this genus: it decays almost as quickly as the aquatic kinds, when exposed to the air, and is seldom half an hour in the same state. It is a mere gelatinous substance, variously divided into a kind of lobes, of an irregular figure, an inch or two in length, and near as much in breadth, and often above half an inch in thickness: these lie irregularly over one another, and constitute, as it were, one mass of jelly, the surface of which is variously sinuated. The lobes are a sort of very thick membranes, of a tender and soft texture, and shake like a mass of size, or thick jelly, on the slightest touch. Their colour is at first a deep dark green, and afterwards yellowish. When dried, they become thin membranes, transparent, and scarce thicker than leaf-gold. It grows on the surface of the earth, though it is scarce possible to distinguish any roots by which it adheres to it, and is common in rainy seasons, in spring and autumn, in meadows and in garden-walks. It grows very quick in the wet, but, as soon as the rain is over, the sun and wind presently dry it up. If it's growth be traced from the earliest visible period, it is found, at first, in small globules, eight, ten, or more in a cluster: these are as big as great pin's-heads, and, by degrees, increase in size, and each furnishes one of the lobes already mentioned, which adhere one to another, some more firmly, others more slightly, and so form the whole plant.

Scarce any of the botanical writers have omitted the mention of this plant; nor have the chemists been less fond of it: the vulgar well know it too, and are apt to believe it somewhat preternatural; our common people suppose that it is the meteor which they know by the name of a falling star, dropped on the ground. The Swedes, Linnæus tells us, take it for a fragment of a cloud, tumbled down by some accident. Paracelsus gave it the whimsical name of *Noftoch*, which it has retained with many people since. Micheli establishes it into a genus, and calls it *Linkia*: Mentzel makes it a *Lichen*, and Vaillant calls it *Muscus fugax, membranaceus, pinguis*. Ray, in his Synopsis, calls it *Ulva terrestris, pinguis, et fugax*: Linnæus, *Byssus gelatinosa, fugax, terrestris*, though not very properly according to his own generical characters. Dillenius, in his *Catalogus Giffensis*, calls it a *Lichenoides*, but, in his *History of the Mosses*, he makes it a *Tremella*.

The other species of *Collema* are, 1. A fine-branched Sea-*Collema*. 2. The bushy, larger Sea-*Collema*. 3. The filici-form Land *Collema*. 4. The black, tough, Tree-*Collema*, called by the vulgar *Witches-Butter*: and, 5. The bladdery *Collema*.

The *Collema sinuosa fugax*, or *Noftoch*, is the only species of this genus that was ever thought of for medicinal purposes. It is recommended by some, as an external remedy for ulcers; and some have given it internally, as an anodyne. The chemists

are

are fond of a notion, that a spirit may be drawn from it fit for the radical solution of gold; but this is about as probable as their other imaginations. Chemically analysed, it is found to contain a great quantity of phlegm, an essential oil, a volatile, urinous spirit and salt, and a small quantity of a fixed alkaline salt. These are principles contained, more or less, in almost all vegetables, but, in general, the Mosses of this kind afford more of them than what are called the more perfect plants; and may be supposed, therefore, to possess many virtues, were they to be examined more at large than has yet been done. The common people in Leicestershire give this internally in fevers, and, as they pretend, with great success; but it is not only in the mouths of the vulgar that the good effects owing merely to the efforts of nature are attributed to medicines.

M O S S E S.

Class the Third.

Such as consist of firm and somewhat rigid stalks.

Genus the First.

U S N E A.

U S N E A is a genus of Mosses, consisting of mere filaments only, but these of a tough and firm texture, and exhibiting on their surfaces some appearance of a fructification, in a kind of scutellæ, or orbicular bodies, growing from several parts of them, sometimes from the sides, sometimes from the extremities. The species of *Usnea* described by authors are no less than sixteen, to which we are to add three very distinct kinds, which have hitherto escaped notice. We shall describe two or three of the more singular *Usneæ* at large, after which the names will be sufficient to distinguish the rest of them.

Micheli has gone so far as to describe the fructification of the plants of this and the succeeding genera particularly. He tells us that these scutellæ are the parts which contain the male flowers, and that the female flowers, and the seeds which succeed them, are dispersed in the manner of a fine powder on other parts of the plants, sometimes on other plants of the same species. Some observations of our own, however, have led us, though we greatly honour Micheli, not to pay quite so much respect to these his discoveries as to establish genera from them, as Linnæus has done: in objects so minute there is infinite difficulty in the way of a perfect explication.

1. *Usnea villosa implicata.*

The tufted, tangled Usnea.

This is the largest and most conspicuous of all the *Usneæ*: it hangs in great tufts from the bodies of old trees, and its extremities have so much the appearance of hairs, that it has obtained the general name of a hairy, or bearded, tree Moss. It grows from a firm base, affixed to the bark of some old tree, and generally rises from it with a single stem. This is about the thickness of a common packthread, and, from its bottom to the extremity almost, sends off a vast number of lateral branches; these send each a number of others off, and these are again the parents of others, which, at last, terminate in long and slender filaments, scarce thicker than horse-hairs: these surrounding the main stalk every way, and all sending their ramifications strait downward, the whole has the appearance of a great tuft of long hair; and the several branches, in their way down, intangling with one another, give it a strangely complicated appearance. These filaments, as well as the main stalks, are somewhat rigid, and very tough: they consist of a soft bark, and a harder internal substance. The whole plant is of a pale ash colour, or grey. At the extremities of the filaments, and sometimes on other parts of the plant, there grow orbicular scutellæ; these are of a sixth of an inch, or thereabout, in diameter, and are so lightly hollowed, that they appear almost flat: they are of a pale grey on the upper side, and brownish below, and have a sort of hair like radii about them.

It grows in thick forests, and is very common in Germany and Poland: with us it is more rare. I have met with it, however, in prodigious abundance in Charlton-forest in Suffex.

The botanical writers, in general, have described this Moss: it was long in use in the shops, under the name of *Usnea*. Gesner and Ruellius describe it under the name of *Muscus arborum*; *Muscus arboreus* is also a name many have called it by. Aldrovand calls it *Anthelos fagi*, and Dillenius, in his *Catalogus Giffensis*, *Conferva arborea cinerea*; but, in his *History of the Mosses*, he has called it *Usnea*, and, very judiciously, establishes a genus under that name. Micheli calls it *Lichen cinereus, longissimus, barbatus receptaculis florum rufescentibus coronatis*; and Linnæus, *Lichen ramis filiformibus ramosis pendulis confertis*, in his *Flora Laponica*: but this Michelian genus of *Lichen* is much too large, and is established on too vague principles.

2. *Usnea divaricata dura.*

Hard, divaricated Usnea.

This singular species of *Usnea* rarely grows to more than five inches in length. It rises single, from a small, flattish base, but it's stem immediately divides into two or three parts, and these, as they extend themselves, divaricate again and again in the same manner; so that, after the first quarter of an inch from the base, it is impossible to say which is the main stalk, or, indeed, that there is any such. It's branches are of a rounded figure, gradually growing smaller as they approach their extremities; they are remarkably hard and rigid, feeling something like an iron wire to the touch: notwithstanding that they branch out so freely, the whole never forms a thick tuft, the divarications fall several ways, and leave the plant very loose and open. The colour of the whole is a greenish grey, where it thrives well; in other places it is brownish, and often does not grow to much more than an inch in length. It grows on old trees, and sometimes on posts, and even on stones. It neither hangs down, as the preceding *Usnea*, nor stands erect, as the following species, but creeps every way upon the substance it grows on, and often adheres firmly to it. At the tops of the divarications there grow scutellæ, of an orbicular figure, and greyish colour, somewhat hollowed, and ornamented with a number of cirri, or short hairs, at their edges. It is a very scarce species, and the scutellæ are yet more rarely found upon it. I have met with it in the forest of Dean in Gloucestershire, but never saw any scutellæ on it there; in Northamptonshire, near Peterborough, I met with it on a rotten gate-post, with four scutellæ on one plant. Many of the late botanical writers have been acquainted with it: Merret, in his *Pinax*, calls it *Muscus caule rigido fili instar chalybei*. Plukenet and Ray also distinguish it by the same name. Buxbaum calls it *Lichen capillaceus setæ equinæ instar rigidus, ex fusco virens*: Celsius, *Lichenoides caule rigido*; and Dillenius, in his *Catalogus Giffensis*, makes it a *Conferva arborea*; but, in his *History of the Mosses*, he describes it under the name of *Usnea rigida horsum vorsum extensa*.

3. *Usnea ramosa crassior.*

Thick-branched Usnea.

This species adheres to the tree on which it grows by a woody tubercle, often of considerable thickness. From this base there rises a single stalk, of the thickness of a packthread; this sends off, on every side, a number of branches, and is itself continued to the very extremity, but lessening in diameter all the way. The whole plant is usually about an inch and half, or, at the utmost, a little more than two inches high, and the main stalk, as well as the several branches it sends off, are furnished with a number of fibrils, like short hairs, all the way up, and both the main stalk, and these branches, terminate in such. The colour of the whole plant is a grey, sometimes with a cast of yellowish in it. At the extremities of it's branches sometimes, though rarely, there grow orbicular scutellæ, like those of the others; they are flat, a little hollowed, and of the breadth of a six-pence, and are cirrated, or hairy, at their edges.

It is a very common species, growing abundantly on almost all our old trees. It stands erect on them, and is sufficiently robust and rigid. It is not very frequently, however, found with it's scutellæ on it. It varies extremely in it's manner of growth, according to the exposure, and quantity of nourishment supplied it; and hence has been described

described half a dozen times over by many of the late botanical writers, under the names of so many species. It has been mentioned under the name of *Muscus arboreus floridus*, by most of the late authors. Caspar Bauhine calls it *Muscus arboreus, cum orbiculis*; John Bauhine, *Muscus peltatus*; Morison, *Muscofungus arborum capillaceus*. Micheli has evidently described it three times, under the names of three different species, in his N^o. 12, N^o. 39, &c.

4. *Usnea compressa*.

Flat-branched *Usnea*.

The *Usnea* of the Arabians.

This is a moderately large and long species. It grows to the trunks and branches of trees by a flat base, of the breadth of a silver penny, or thereabout; from this base there arises usually only one stalk, but sometimes more. The main stalk continues entire for about an inch from the base, after which it begins to divaricate into several branches; these all break again into others, so that, from one main stalk, the branches at the extremity are often forty or fifty. The whole plant is of a whitish colour. It grows to five or six inches in length, and its main stalk, as well as the several ramifications, are not round, but somewhat flattened. The surface is perfectly smooth, and somewhat glossy. The main stalk is seldom thicker than a packthread, and the ramifications terminate in fine and pointed capillaments. The branches do not run straight, as in many of the *Usneæ*, but are frequently very crooked, and, at the extremities, have been supposed to have somewhat of a horned figure. It is not a native of England, nor, so far as is known, of Europe; it is very common in the East Indies, where it has a very fragrant and perfumed smell; but this is generally lost, before the plant can be brought over to us. It grows on trees, and sometimes on old wood that has been wrought. The Indians call it *Sabgia*. Camelli has described it to Ray under the name of *Muscus arboreus candidus et odorifer*, in which name it stands in his History. Belonius calls it *Bryon*, and tells us it is sold at Constantinople, where it is called *Usneck*, and laughs at those who suppose our *Usnea* the *Usnea* of the Arabians.

The other species of the *Usnea* described by authors are, 1. Micheli's dichotomous kind, with fine points. 2. The dichotomous *Usnea*, with thicker points. 3. The finer and longer *Usnea*, with the weak bark: the cortical part of this is apt to crack annularly, and the segments of it then resemble the beads strung on a necklace. 4. The flat-branched *Usnea*. 5. The bearded, finer *Usnea*. 6. The black, jubated *Usnea*. 7. The hard, woolly, black *Usnea*. 8. The black, tufted *Usnea*. 9. The horse-hair *Usnea*. 10. The small, grey, branched *Usnea*. 11. The orange-coloured, forked *Usnea*. 12. The yellow, rigid *Usnea*. 13. The white, smooth, sweet *Usnea*. The three new species are, 1. A yellow, short, soft, and extremely-branched one. 2. A yellowish, very long, rigid, and stringy one: both these are found in Charlton-forest; and, 3. A brown, divaricated, and very bushy one, found near Mount Sorrel in Leicestershire.

The *Usneæ* have the fortune to be more in credit, as medicines, than the Mosses of any other genus; there are no less than three species celebrated by medical writers for their virtues. The *Usnea villosa implicata*, first described, has been greatly celebrated as an astringent, and prescribed in diarrhoeas, dysenteries, and hæmorrhages. Sachsius recommends its powder extremely as a styptic, and Linnaeus tells us, that the Laplanders use it to their feet, when they are sore with much walking. Many other virtues have also been attributed to it; but this has been through the error of supposing it the same with the *Usnea* of the Arabians, or the species last described here.

Mr Ray recommends the *Usnea ramosa crassior*, boiled in ale, against defluxions of all kinds, and tells us, that it was also used in powder for the chin-cough, and all other inveterate coughs. The *Usnea compressa* is the true *Usnea* of the Arabians, and has long retained its place in the catalogues of the materia medica; but the first species, or, in defect of that, any tree Moss, that came most readily to hand, was used in its place. Camelli assures us, that the genuine Moss is, when fresh, of a very fragrant smell. It is used as a perfume at this time by the Turks, and stands recommended as a cordial by the Arabian writers.

M O S S E S.

Class the Third. Genus the Second.

P L A T Y S M A.

PLATYSMA is a genus of Mosses, consisting of a firm, tough, and flexile matter, formed into ramifications, which are flat and thin, and, in some degree, resemble, in their divisions, the sea fuci.

These Mosses have the same appearance of fructifications with the usneæ; they have roundish scutellæ growing on the edges, or surfaces, of their leaves, in many parts, which evidently serve to the propagation of the species, though the exact manner in which that is performed is not yet discovered.

The later botanical writers have made all these plants species of that enormous genus lichenoides, or, according to Linnæus, lichen, which takes in a yet greater number; but, though it must be allowed that the fructification appears much alike in all these, it is rash to determine that it is really perfectly alike in all, from the little we at present know of it; and it is impracticable to establish generical characters on the parts of fructification, in plants in which we are so little informed what those parts truly are. Micheli led Linnæus into this; but not even the reverence due to two such names as these ought to plead against innovation, in a case where the distinction of so many hundred plants as are included under this term lichen is impracticable without it.

1. *Platysma reticulatum marginibus scutelliferis.*

The reticulated Platysma, with the scutellæ on the edges. **Oak Lungs.**

This is the largest of all the plants of this genus. It grows to the trees on which it is found by a firm, and somewhat thick, woody base; from this there arise sometimes one, sometimes more distinct plants. Each plant is, near the base, a broad and flat substance, of a rough surface, and full of veins and risings. It expands in breadth for half an inch, an inch, or more, and then begins to divaricate, or separate itself into segments. The whole plant is frequently eight or ten inches long, and six or more in diameter. The several segments, where they are separate, are usually about half an inch broad, but they frequently coalesce, and form a continued substance, of an inch or two in breadth; and, what is more singular, those ramifications, which go off first from the main plant, often unite themselves to it again at their ends; a thing not uncommon in the vegetation of the submarine plants, but which we do not meet with in any other, except this and some other of the Mosses of this class. The several divarications are variously divided into segments, and usually terminate in a forked end. The whole plant is of the thickness of a strong parchment, and is almost as tough as leather. Its colour is a pale brownish yellow. The surface of the whole is extremely irregular. There are prominent veins running all over it in an irregularly reticulated form; between these there are a multitude of depressions, which form as many protuberances on the under side. These prominent parts are paler than the rest of the under side, which is sometimes only a little darker than the upper, and sometimes blackish, and is somewhat downy, and sends out, at certain distances, a number of cirri, by which it fixes itself down to the tree, or to the Mosses on its surface. On the edges of the segments, and in the several parts near them, grow a great number of scutellæ; they are not very large, but very hard, solid, of a reddish brown on the upper side, and paler underneath. On the edges of the segments also, and in some places along the prominent ribs of the plant, near the extremities, there appear rows of little protuberances, of a grey colour, and formed of congeries of a dusty matter. It is highly probable that these have some share in the fructification, but what that is, or whether they belong to the male or female parts, is not easy to be determined: Micheli makes them the female parts, but, we are afraid, without sufficient foundation. Læfeli and Ruppert have described the farinaceous and peltiferous plants of this species as two different species. Nor is this, indeed, the only instance of more than one plant being made out of this. It varies extremely in its manner of growth: its young leaves are small, and particularly divaricated, so as to seem different plants.

Micheli

Micheli has figured these, and Bobart mentions a variety of it, with segments three times as broad as they usually are; the segments are sometimes also found narrower, and undulated at the edges, in which case the whole surface of the leaf is generally smoother, and, sometimes, it grows very short, and divaricated into a great number of divisions at the extremities.

It is a native of England, but is more common in other parts of Europe, where there are thicker forests. I have met with it, however, very fine in Charlton-forest in Suffex. It grows to the oak, beach, and other trees. Its scutellæ appear in winter.

The botanical writers, in general, have mentioned this species; it is known in the shops, under the name of Pulmonaria; and the common people with us call it, Tree longwort. Pulmonaria, and Muscus pulmonarius, are the names also that it stands under in most of the authors. Aldrovand calls it, Lichen arboreus; and Dillenius makes it a Lichenoides. All the authors who have figured it, however, except Micheli, have omitted the scutellæ, which is wonderful, for they are frequent enough on it.

2. *Platysma molle angustius.*

The soft and narrow Platysma.

This is one of the most common Mosses we meet with; not only trees of all kinds are frequently, in a manner, covered with it; but old boards, such as pales, gates, and the like, afford it in the same abundance.

Sometimes one, sometimes more plants, arise from the same root: It is single at the base, and of the sixth of an inch, or thereabout, in breadth; but it soon divides into a multitude of ramifications, which subdivide again into others, and finally terminate in forked extremities. It grows to an inch and half, or two inches, in length, and its tufts often are nearly as much in diameter. Its surface is tolerably smooth; its colour a pale grey, or bright ash colour; and it is remarkably soft to the touch. It is tough and thin, and is of an insipid taste, but with something of astringency in it: it is often full of hollows on the upper surface, and always somewhat downy beneath. Its divarications have been thought by some to resemble those of a stag's horns; they are often dichotomous, as in many of the sea fucus's; sometimes trichotomous, sometimes perfectly irregular. When this plant produces its scutellæ, its segments are usually narrower; the scutellæ grow at the extremities and along the edges. The other plants have, at their edges also, and on the prominent veins that surround the little cavities on the surface, a kind of farinaceous globules, which evidently also serve for the office of fructification. Whether these are the male or female parts, is not known; but they seem in this species to grow on distinct plants from the male, though in the former on the same.

This common species of *Platysma* differs so greatly from itself, under its various circumstances of growth and fructification, that we could point out no less than thirteen several varieties of it, which are described by authors, as distinct species of Lichenoides. While young, its segments are few, and are cristated; afterwards it varies several times, before it arrives at its full growth: when young, it has few depressions; when full grown, it is usually full of them. The segments are sometimes very broad, sometimes very narrow, often fimbriated at the edges or extremities: sometimes the ramifications are few, sometimes they are extremely numerous.

Almost all the botanical writers have described this under the names of Lichen arborum, and Lichenoides arborum. Imperatus calls it, Foglio diramato. Others, Ceratites muscus arboreus, and Bronchialis. It is singular that Micheli never saw more than one plant of this with the scutellæ, though common enough in Italy. With us the scutellæ are very frequent on it.

3. *Platysma sinuosum scutellis ovato-rotundis.*

Sinuous Platysma, with flat, rounded scutellæ.

This is the species commonly called grey, ground liverwort, and famous for the cure of the bite of a mad dog. It is a large and spreading plant for one of this genus. It grows sometimes single, sometimes several leaves rise from the same base. They are three or four inches long, and are two inches, or more, in breadth, when distinct; but they often grow together in such a manner, as to make a surface of four or five inches broad. The leaf, in its true shape, is somewhat small at the base, and gradu-

ally grows broader, as it extends itself in length, and is longitudinally divided frequently into a number of segments, which are very broad, and sinuated at the edges, and terminated by obtuse lobes, whose extremities bend inward. This is the usual appearance of the plant, but, when it produces the patellæ or scutellæ, these terminating lobes grow narrower and longer, and at their extremities produce the scutellæ, which are reddish in colour, very hard and firm, and of a roundish or oblong form, and somewhat convex on the upper side; on the lower side they are all hollow, and of the same colour with the leaves themselves, which is a paler or deeper ash colour.

The leaves are thin, and of a membranaceous substance; tough, and of a whitish colour, and downy underneath, with very prominent and downy, or hairy, ribs on them, which send off many branches on every side, from whence descend the little fibrillæ, which are the root of the plant, and serve at once to fix it to the earth, and to take in it's nourishment. These ribs, on the lower side of the leaves, have little long furrows answering to them on the upper part.

The plant is frequent with us in barren ground, by ditch-sides, and on heaths; sometimes on the ground, and sometimes about the stumps of old trees. Most of the writers on these subjects have described it. They have called it, *Lichen terrestris cinereus*; this is the name given it by Mr Ray, and which it yet retains in the shops; *Muscus pulmonarius terrestris*, *Muscofungus hepaticæ facie*, and by many other such names. Dillenius makes it one of his great genus of *Lichenoides*: he calls it, *Lichenoides digitatum, cinereum, lactucæ foliis sinuosis*.

4. *Platysma corniculatum*.

The horned Platysma.

This is one of the most singular species of this whole genus. It usually grows from a firm and hard base, sometimes singly, sometimes many plants in a cluster. It rises from the base with a broad and flat membranaceous or coriaceous substance, as thick as a strong parchment, and of the breadth of a finger, sometimes more, and often less; this almost immediately divaricates into a number of ramifications. The whole plant grows often to be six or eight inches high, and four or five broad: it is very tough and firm, of a greyish colour, and somewhat hoary or downy on the surface. The broadest of the segments are narrower than the main part of the base, and they terminate in long and narrow extremities, which, as they grow from the several lower, as well as upper ramifications, give the whole an appearance of some horn of the stag kind. The extremities are sometimes bifid, sometimes trifid, and sometimes divided into more numerous parts. The scutellæ grow on the edges, and in the middle of the leaves; they are small, roundish, very hard, and of a grey colour; they stand on short pedicles: on other parts of the leaves there are also little, round, farinaceous globules.

This species is not a native of England: we meet with it frequently brought over from the Canaries, among the Orcelle or Canary weed, described under the next genus, and used in dying. It is also common in many parts of the East Indies. It grows on rocks and on trees. There is something, in the growth of all the species of this genus, that greatly resembles the fucus's, but this species has it more than any other of them. The colour of the plant itself, and some other obvious circumstances, distinguish, or ought at least to distinguish, what genus it belongs to, when seen itself; but a figure of it might easily be mistaken for one of a fucus. Most of the botanical writers have described it, but they have called it by a great variety of generical names. Imperatus and both the Bauhines make it a *Fucus verrucosus*; and many others call it, *Fucus verrucosus tinctorius*. John Bauhine also calls it, *Alga tinctoria*, as do many others. Petiver calls it, *Lichen madara spatanus*; and Plukenet, *Muscus arboreus madara spatanus*. Kempfer has it under the name of *Muscus in petris altissimis crescens*.

The other species of *Platysma* are very numerous in nature, and much more so in the works of the botanical writers, who, by mistaking their varieties for distinct species, have extended the number vastly beyond it's native bounds. The more singular species, beside the four we have described at large, are, 1. The smooth, endive-leav'd *Platysma*. 2. The *Platysma*, resembling the Fallopian tube. 3. The pale, blue, scolloped-leaved *Platysma*. 4. The dark-coloured, digitated *Platysma*, with lettuce-like leaves. 5. The livid *Platysma*, with reversed scutellæ. 6. The eryngo-leaved *Platysma*. 7. The spungy, buck's horn *Platysma*. 8. The grey, clouded, coriaceous

ceous *Platysma*. 9. The pustulous *Platysma*. 10. The bluish *Platysma*, with black warts. 11. The hairy *Platysma*, with large, perforated, scutellæ; and 12. The chestnut-coloured, horned *Platysma*.

Of the four species of *Platysma* we have described, three are of use, and well known in the shops; the first and third, as medicines; the fourth, in dying.

The first or great tree lungwort has been at all times famous in diseases of the breast and lungs. It has been given in obstinate coughs, and in asthmas, in form of syrup or decoction, it is said, with great success; and also in the fluor albus, and in dysenteries, in which cases it is given in powder, half a dram for a dose. Breynius gives us an account of an obstinate jaundice, cured only by a decoction of this Moss. It is also esteemed a vulnerary. It is not much in use in the shops at present; but physic, like other things, has it's fashions: we are not to suppose it the less valuable for such a neglect.

The third kind is the grey, ground liverwort, famous against the bite of a mad dog, and of which is made the pulvis antilyssus, which is only a mixture of half the quantity of pepper with the powder of this plant.

The last species or corniculated *Platysma* is used by the dyers, along with the orcelle with which it comes over; and they imagine it helps the colour, but it is not used any where, that we know of, alone.

M O S S E S.

Class the Third. Genus the Third.

C L A D O N I A.

C L A D O N I A is a genus of Mosses, consisting of a firm, tough, and flexile matter, formed into stalks of a roundish figure, sometimes almost simple, sometimes more ramified, and, in many of the species, resembling small shrubs.

The fructification of this genus of Mosses, so far as it is yet observed, resembles in some degree that of the usnea and platysma, there appearing, at the extremities of the branches, a kind of tubercles, somewhat resembling the scutellæ of those plants. These tubercles, however, are usually more prominent, and of a softer texture than the scutellæ of those Mosses. These tubercles are thicker and more fleshy, in general, in the less-branched species, and thinner in the more-branched ones. Micheli determines these tubercles to be the male flowers of these plants; and certain dusty or farinaceous globules, found on other parts of them, to be the female, and contain the seeds. Dillenius is of a contrary opinion, esteeming these dusty globules the male parts, the others the female; perhaps, hereafter, something may be added to the systems of this kind; at present, the whole is much too uncertain to found generical distinctions upon.

Dillenius calls the plants of this genus, together with those of the next, by the generical name *Coralloides*; a term which Tournefort and others have used to denote a genus of branched fungus's, and which, indeed, much better expresses those bodies than these Mosses.

1. *Cladonia furcata.*

The forked Cladonia.

This is the least ramified, or most simple, of all the genuine *Cladonia*: we meet with accounts of plants of this genus, indeed, in some authors, under the name of *Lichenoides*, consisting of only one single undivided stalk; of this kind is the *Lichenoides caule simplici* of Ray and others, but this is an error; what they thus took for a peculiar species of *muscus corniculatus*, is indeed no other than the first shoot of one of the tall cup Mosses, hereafter to be described, while not yet opened.

This furcated *Cladonia* many have described also under the name of *Muscus corniculatus*. It grows to an inch and half, or two inches, high; it rises with a single stem, of the thickness of a small packthread, of a greyish colour, and hollow: toward the top it divides into three or four ramifications, smaller than the main stem, and terminating in sharp points; these, when simple and regular in their growth, give it

it the furcated figure, from which we have named it; but they frequently grow irregularly, and put on so many different appearances, that the plant has been divided, according to them, into ten or a dozen different species. In the simplest state the top is divided into two, three, or four parts, which stand nearly erect: but at other times these bend downwards, and have other points growing up from them; sometimes the main stalk itself sends off a number of lateral branches. The whole plant is sometimes in great part smooth and naked, at others there are a sort of green, foliaceous excrescences, roundish and very short, growing all over it. It very rarely produces any tubercles; but, when it is in its most ramified state, they are most frequent upon it; they stand at the tops of the ramifications, and are small, roundish, and of a brown colour.

This species is very frequent in dry places, on heaths, and in woods not too shady; Hampstead-heath produces abundance of it. The generality of authors have described it under the names of *Muscus corniculatus*, and *Muscus ceratoides*. Tournefort calls it, *Coralloides cornua cervi referens*; and Linnæus, *Lichen caule erecto, dichotomo, ramis subulatis*. Tabernomontanus has a good figure of it, but no description. C. Bauhine confounds it with the *Filix cornuta saxatilis*, which is wonderful in so accurate a writer. Parkinson gives a bad copy of Tabernomontanus's figure, and a false description adapted to it: he seems never to have seen the plant. Johnson has made Gerard, on this head, worse than he was, by putting C. Bauhine's figure of the *filix saxatilis cornuta*, instead of Tabernomontanus's figure, which Gerard had copied. Upon the whole, it is something singular, that there is scarce any plant more common than this, and scarce any one about which the botanical writers have blundered more.

2. *Cladonia ramosissima cava*.

Branched, hollow Cladonia.

This is a very beautiful species. It rises from the earth with sometimes a single stem, sometimes two or more together, and often with smaller and shorter plants about them. The main stalk is of the thickness of a large packthread, and sends off a multitude of branches on every side, which are again divided and subdivided into smaller, so that the whole form the appearance of an extremely ramose, little shrub. The whole plant is generally two or three inches in height, and an inch or more in diameter. The main stalk and ramifications are all hollow, and the tips of the extreme ones generally bend downwards; the several branches, in their growth up, frequently grow to one another; and, the several plants, from the same common base, often entangling their branches with one another, the whole cluster generally appears strangely interwoven and confused: the subdivisions which terminate the ramifications are very short and fine, and are often four or five in number from each. The tubercles grow on the extremities of these fibrils, and are small, roundish, and of a brown colour at first, but afterwards they grow almost black. The whole plant is flexible, but not very tough, a small force breaking its largest branches. It never has any of those foliaceous excrescences common on the former. Such is the general appearance of this species, but it varies extremely in its manner of growth, and has thence been described by many authors under the names of various species. The branches are sometimes terminated by stellar expansions, sometimes the main stem is wanting, and the whole plant looks reticular.

It grows abundantly all over Europe. The more northern climates abound most of all with it, but our heaths afford a very large quantity of it. It is described by authors under the various names of *Muscus corallinus*, *Muscus coralloides*, *Muscus tubulosus ramosissimus*, and the like. Dillenius calls it, *Coralloides montanum fruticuli specie ubique caudicans*. Micheli, *Lichen coralloides receptaculis florum rufescentibus perexiguus*; and Linnæus, *Lichen caule erecto, tereti, ramosissimo, alis perforatis filiformibus*. Ray, in his Catalogue of the English Plants, commends Gerard for the just description he gives of this Moss, but, somewhat unluckily, for Gerard describes the common coralline under its name. His editor and emaculator Johnson did not find this out; but Ray prudently omits his encomium on Gerard, in his subsequent works.

3. *Cladonia ramosissima solida.**Solid, branched Cladonia.*

This is an extremely pretty little plant, considerably smaller than the former, but not less branched. It usually rises with a single stem, of the thickness of a small packthread, but not round, but somewhat flattened. This scarce continues single the third of an inch; it almost immediately divaricates into two or three branches, and each of these into as many others, which in the same manner divide again and again, till in fine they form an extremely ramose cluster: all these branches, as well as the main stem, are flattened, and they are all solid, not hollow, as in the former kind. It grows to about an inch in height, rarely more, and is throughout of a brown colour; the larger branches of a paler, and the smaller ramifications of a deeper brown. The whole plant usually forms a sort of little bush, at least as much in diameter as in height, and the extremities of the ramifications are terminated by a kind of prickles, the fibrils into which they there divide being all solid, and sharp at the points. These are weaker and more obtuse at first, but, as the plant grows to it's full size, they become sufficiently hard and rigid: they grow not only at the extremities, but along the sides also of the branches. There are never any foliaceous excrescences on this plant, but it's branches are bare, smooth, and, when broken, are found to have a kind of pith within.

It grows on heaths, and in other barren places in England, and elsewhere. Hampstead-heath affords it, in some few places, not very sparingly, but most of our botanical people overlook it there. It is described by Ray under the name of *Muscus montanus*, *fuscus*, *ramosissimus*, *solidus*. Merian calls it, *Muscofungus*, *coralloides*, *fuscus*. Dillenius, *Lichenoides fruticuli specie*, *fuscum*, *spinosum*. Buxbaum calls it, *Lichen coralloides*, *aculeatus*, *nigricans*; and Micheli, *Lichen terrestris*, *atrofuscus*, *minor*, *veluti aculeatus*. He has another which he calls Major, and which is evidently but a variety of this.

4. *Cladonia tophacea.**The tophaceous Cladonia.**Orcelle, or Canary-weed.*

This is a very singular species of *Cladonia*, known by our dyers under the name of *Orcelle* and *Canary-weed*. It has for it's base a broad and tuberous lump of a tophaceous or calcarious matter, from which there arise two, three, or four, sometimes more stalks; these are cylindric, and somewhat rigid, but tough, and not easily broken; they grow to two, three, or sometimes four inches high, and are sometimes strait and erect, sometimes crooked and variously bent; some of them are simple or undivided, but others are branched into two, four, or more segments, which are usually long and slender, but sometimes very short. The colour of the whole is sometimes a pale grey, sometimes a dusky brown, or blackish. The surface is smooth, and the whole plant soft to the touch; the branches are all solid, and contain within them a tophaceous matter, like that of the base; some have more, some less of it, but few of them are without a considerable portion of it. The usual thickness of the main stalks is that of a moderate packthread; in different parts of the branches there appear frequent little depressions, and tubercles of various forms, flattened, more prominent, or absolutely rounded; they are usually of a dark brown colour, and are very hard, when broke; they are found to contain a tophaceous matter resembling chalk, wholly the same with that of the base. These tophaceous tubercles are originally contained in a sort of cups, resembling the scutellæ of the common platysma.

It is not a native of England, but it is extremely common in many other places on the rocks about the sea-coast. It is frequent about the Archipelago, and in the Canary Islands, whence we receive it.

This species has been known from the earliest times we have any account of. It's growing near the sea made the antients call it a *fucus*, and it has, indeed, a division in it's ramifications, not unlike that of those plants. Theophrastus was well acquainted with it; he calls it, *πέντιον φύκος*, and tells us, that it grew in Crete, on the rocks near the sea, and that they dyed woollen garments red with it. Dioscorides gives it the same place for it's origin, and calls it, *φύκος θαλάσσιον*; and Pliny borrows his name,

and Theophrastus's account of the use of it. At present our mercantile writers have called it, Orifella, Orifelle, and Roccella. Many of the botanical authors have named it, Fucus tinctorius, and Muscus rupeus infectorius. Tournefort calls it, Lichen Græcus, polypoides, tinctorius; and Boerhaave, Muscofungus ceranoides, albus, tuberculatus, apicibus nigris. Micheli calls it, Lichen saxatilis, Italicus, polypoides, cinereofuscus, crispus. Thevet was the first person who taught us the name of Orifella for it; and some of the writers of that time misunderstood him so far, as to give this as a synonymen of the genista tinctoria.

The species of this genus, beside these three, are considerably numerous in nature, and appear much more so in authors. The more singular among the hollow kinds are, 1. The great, soft, open Cladonia. 2. The curled Cladonia. 3. The prickly, distorted Cladonia. Among the solid ones, 1. The black, reticulated Cladonia. 2. The tuberculose Cladonia. 3. The coralline-like Cladonia. 4. The cypress-like Cladonia. 5. The fucus-like Cladonia. 6. The pod-like Cladonia. 7. The short-pointed, perforated Cladonia.

The Cladoniæ are not without their use in medicine, and in the arts and manufactures. The first species described here, called the Horned Moss, has been long famous in form of a syrup or decoction against coughs, and other diseases of the breast. The second kind has the name Rain-deer Moss, from it's serving as food for the rain-deer of Lapland, and other cold countries, when no other is to be had. The last species or orfelle is well known for it's use in dying. The Dutch had at one time the secret of manufacturing it to themselves; but at present it is done in London, by a set of people called Argol or Orchel-makers. It gives a red in various degrees, and shades, but it does not stand well. Urine and pot-ash seem to be the ingredients used to extract it's colour.

It is singular that this Cladonia has it's fructifications, not at the extremities, as all the rest of this genus have, but on the body of the branches, as the species of platysma; though, in all respects beside, it agrees with the Cladonia, and indeed very much resembles the less-branched kind first described.

I remember to have observed several species of the Cladonia on Rook's-hill near Goodwood, full of a tophaceous matter, such as fills up this orfella. It would be well to try whether such a colour might not be drawn from them.

M O S S E S.

Class the Third. Genus the Fourth.

PYXIDIUM.

PYXIDIUM is a genus of Mosses, consisting of a firm, tough, and flexible matter, formed into the shape of hollowed cups or drinking-glasses, with longer or shorter stems. The parts of fructification in this Moss greatly resemble those of the Cladonia. They are large, soft tubercles, of a convex form, and of a brownish, blackish, or red colour, affixed to the edge of the cup, sometimes on pedicles, sometimes without. The tubercles in the Pyxidia are larger and softer in general than in the Cladonia. In some of the species of the Pyxidia, the cups are very fair and perfect, in others they are less; in some scarce distinguishable.

Linnaeus and Micheli make these all species of the vast genus of lichen, and Dillenius makes them of his genus of coralloides; though, if he had considered his intent of bringing them into it, 'tis probable he would have given some other generical name to the whole.

1. *Pyxidium margine leviter serrato.*

Common Cup-moss.

This is a species of Pyxidium, in it itself almost too common for description; but it's varieties are extremely worthy to be noted, as they have led authors into the error of describing this species under different names, as eight or nine different plants.

The first appearance of this Moss is in a granulated crust, extending itself an inch or two, sometimes much more, over the ground; this, by degrees, expands itself so as to form a sort of leaves of a perfectly irregular and indeterminate figure. They are sinuated at the

the edges, of a greenish colour on the upper side, and whitish underneath; at the bases of these leaves arise the cups; they consist of a pedicle smallest at the bottom, and larger higher up, terminated by a hollow cup, resembling a drinking-glass; the general height of the whole plant is three quarters of an inch, and the colour a greenish grey: the edge of the cup is very lightly serrated. Such is the common appearance; but it sometimes has the whole cavity of the cup covered with greyish globules, and after these has tubercles of various size and form, growing at it's edges. Sometimes the cups expand to the breadth of a shilling, and sometimes they will scarce admit the head of a pin in the full grown plants, of the same species; in some the tubercles stand close on the edges of the cup, in others they are raised on pedicles, and in others new cups on their proper pedicles grow from the old one, and these only bear them; in this case the Cup-moss is called proliferous, and is described as a peculiar species by many. These secondary cups sometimes grow from the sides, sometimes from the center of the old cup, and they often bear others upon them, so that it is common enough to see three, sometimes four, series of them one over another.

From this and many other parallel circumstances, there appears reason to believe, that these tubercles are neither male nor female parts of fructification, but a kind of sboles, like those of the dentaria sobolifera, and some other plants, which are ready to vegetate into new plants wherever they fall, and which falling into the cavity of the cup that produced them, or remaining only too long on it's sides, take root there, and grow, as they would have done on the earth; and perhaps this is not singular to the Cup-mosses, but it may obtain in all of this class.

These are the various forms under which this Pyxidium appears, and under these it has been called Muscus Pyxidatus major, minor, prolifer, and tuberculifolius. Linnæus himself has not escaped this common error of mistaking the varieties of this plant for species, but describes it, in it's common state, in one place, under the name of Lichen caule simplici, calyce turbinato, margine tenui; and in another, in it's central proliferous state, under that of Lichen caule simplici, calyce turbinato, centro simpliciter prolifero.

This Moss, in it's common state, is found on every barren place almost in the kingdom; in it's various proliferous states, we meet with it on Hampstead-heath, and in the woods about Harrow.

2. *Pyxidium gracile margine laciniato.*

The slender Pyxidium, with jagged edges.

The first appearance of this Moss is in form of a scabrous crust, which gradually unfolds itself into leaves of a greenish colour on the upper side, and grey underneath; from the bases of these leaves arise cups of three quarters of an inch high. The pedicles of these are slender, the cups themselves moderately wide and deep, and their edges somewhat deeply jagged; they are of a dusky, greyish-brown colour, with some admixture of green in it; and have sometimes little foliaceous excrescences about them, like those at the base: this species generally grows in considerable clusters together. It is very rarely met with, with the tubercles upon it: they are small, prominent, and brown, and stand on the sides of the serratures.

This is also more rarely proliferous than the common kind, but it is sometimes met with proliferous to a second or third degree from the center, very rarely from the sides.

Many of the botanical writers have confounded this with the common Cup-moss; and others of them, not content with separating it from that, have made two or three species from it's varieties in the different states. Morison describes it, in it's simple state, under the name of Muscogungus Pyxidatus saxatilis; and Micheli describes it twice in two of it's states, once under the name of Lichen Pyxidatus minor; and a second time under that of Lichen, non ramosus, acetabulis fimbriatis. Vaillant has given a very good figure of it, but the serrature of the edges ought to have been expressed deeper. Micheli's first figure does not represent the plant well; his other is better, but the laciniæ are too thick. Linnæus met with it in Lapland, in it's uncommon state of proliferation from the edge; he has described it under the name of Lichen caule simplici, calyce turbinato, margine acuto prolifero.

It is common enough in England, in it's simple state; and I remember to have seen it proliferous to the third degree from the center, on the thatch of a house, in the way to Burntwood in Essex.

3. *Pyxidium*

3. *Pyxidium elatius pyxide minima.**The tall Pyxidium, with very small cups.*

This makes it's first appearance in form of a coarse, scabrous crust, expanded over the earth for three or four inches sometimes, and of a greyish colour. This afterwards expands into a foliaceous matter, of a greenish colour on the outside, and grey underneath. In the midst of this there rise up ten, twenty, or more stalks, from the same crust; these grow to the height of two inches, and are of the thickness of a small pack-thread. They are sometimes strait, sometimes crooked, and, though usually single all the way up, they sometimes divide, toward the top, into two, three, or more branches. They are hollow, of a greyish colour, and are sometimes smooth, sometimes covered with a dusty, excrementitious matter, and sometimes they have little excrescences, like leaves, growing on their surface, in the manner of those from the crust. People, who have met with it in this state, have described it under the name of a *Muscus corniculatus*, never supposing that it would, when perfect, be of the cup-kind. When full grown, the tops of the plant, or of it's ramifications, if it have any, open into a very small and shallow kind of cup, round the edges of which there stand the fructifications, in form of small, brown tubercles. These, as in the other *Pyxidia*, sometimes stand close on the edge of the cup, sometimes they are elevated on little pedicles, and, in some places, it is met with proliferous, in which state it makes a very singular figure.

The variety of forms under which this Moss appears, not only when it's cups are opened, but before, is surprising. It is accordingly described by authors under the names of various species of lichenoides; and these errors have helped not a little to swell that genus into so vast an extent.

It is extremely common on our heaths, and in other barren places. Merret has described it under the name of *Lichen tubulatus*; Doody calls it *Muscus licheniformis cornu simplici*, under which name it stands in the Synopsis of British Plants. Tournefort calls it *Lichen tubulatus cinereus*, and Linnæus, who met with it in Lapland, calls it *Lichen caule simplici, tubulato, rarius bifido*. Micheli describes it, three times, under as many names, in three of it's different states.

The other species of this genus, really distinct from these, and from one another, are considerably numerous: of the *Pyxidia* with perfect cups, the principal species are, 1. The *Pyxidium* with scarlet tubercles. 2. The short-footed *Pyxidium*. 3. The elk's-horn *Pyxidium*. 4. The tall-branched and jagged *Pyxidium*. Among those with less conspicuous cups the principal are, 1. The thigh-bone *Pyxidium*. 2. The corniculate *Pyxidium*. 3. The ramose *Pyxidium*. 4. The scarlet-headed, branched *Pyxidium*. 5. The brown-headed, simple, tall *Pyxidium*. The names of these, after the description at large of the others, will be sufficient to distinguish them.

All the Cup Mosses have been famous, throughout several ages, for the cure of coughs of the most inveterate kinds, and particularly for what is called in children the chin-cough: the common one is the species most recommended. It has not been of late received into the shops, or prescribed by physicians; but it is of the number of those things which an established reputation for ages, and a multitude of accounts of cures performed by them, ought to recommend to a trial in the shops.

M O S S E S.

*Class the Fourth.**Such as consist merely of a dry, crustaceous, or else of a gelatinous matter.**Genus the First.*

P L A C O D I U M.

PLACODIUM is a genus of Mosses, consisting of a friable, or of a gelatinous matter, formed into crusts, or flat cakes, sometimes merely scabrous, and granular, but, at others, somewhat foliaceous about the edges.

The

The fructification in this genus appears in form of bractææ, or spangles, on the surface of the plant, and principally about the center; these are very various in their figure, sometimes prominent, like the tubercles of the pyxidia, sometimes flat, and sometimes hollowed, like the scutellæ of the species of platysma. These different figures appear not only on the different species, but in the fructifications of the same plant, in their different degrees of maturity. The foliaceous terminations of the matter of these Mosses are more perfect in some, and less so in others and in some they are closely affixed down to the substance they grow upon. In others they are more loose and free; in some they are regularly divided into segments, and only fixed down by cirri. Dillenius has ranked these among his lichenoides, and Micheli and Linnæus, in their yet larger genus of lichen; and it is to be observed, that some of the lycogalæ of Micheli evidently belong also to this genus, and also that some plants which Dillenius has arranged among these are pyxidia, or cup Mosses; what he calls crustaceous in them being no more than the foliaceous base common to all the plants of that genus.

1. *Placodium bracteis majusculis limbo albo cinctis.*

The Placodium with large bractææ, edged with white.

This is of the number of the less beautiful Placodiæ. It has nothing foliaceous about it, but is a mere scabrous, irregular crust, of a dry, friable, granulose matter, and of a grey colour. This crust rises in prominences in some places, and has depressions and cracks in others, with irregularly undulated lines in the several parts. It is usually covered with a somewhat coarse grey powder, easily rubbed off with the fingers; and, about its center, it produces large bractææ, twenty or more upon a plant. These are at first closed at the top, but they in time open into a kind of cups. They have no pedicles, and are but little hollowed; their cavity is brown, but their limb or edge all round is white.

The whole plant is thick, but very brittle. It does not form itself into regularly figured crusts, but extends any way to the length of an inch or two, and often as much in diameter. It grows on old walls, on the barks of trees, and on the ground. Micheli describes it under the name of Lichen crustaceus, saxatilis, farinaceus, verrucosus, candidus, omnium crassissimus, receptaculis florum nigricantibus. Dillenius calls it Lichenoides tartareum, farinaceum, scutellatum umbone fusco, and tells us that Celsius, who sent it him from Upsal, told him it would make an excellent red dye. We have it in Leicestershire and Warwickshire very abundantly; and not only this, but many other of the Mosses both of this and the former genus, contain a matter so very like that of the orfella, that they deserve to be tried for producing the same colour, most of them being plentiful enough at home.

2. *Placodium areolatum bracteis flavis.*

Areolated Placodium, with yellow bractææ.

This is a much handsomer species than the former. It always grows in a circular, or nearly circular form, and is closely fixed down to the substance it grows on all the way through, but somewhat less so at the edges than in the middle. It consists of a very thin and fine crustaceous matter, of a strong yellow colour, very friable, and appearing only granular toward the center, but formed into somewhat of a foliaceous appearance at the edges, and undulated and sinuous, though without distinction into leaves, lobes, or segments. The male and female parts of fructification seem to be on different plants; some of those, evidently of the same species, being less regularly formed, less round in their growth, and less foliated at the edges, and having a dusty, farinaceous matter in little granules; and others producing bractææ. These are, at first, yellow in the center, but white at the edges, and a little hollow; but, as they grow larger, the white limb vanishes, and they grow plain and yellow, and sometimes they become prominent in the middle; the bractææ and the farinaceous matter are sometimes both seen on the same plant in this species, but that is less common.

It is frequent with us on walls and stones, and sometimes on old trees. Micheli describes it under the name of Lichen crustaceus saxatilis, crusta tenuiore lutea, receptaculis florum saturate aureis. Buxbaum calls it Lichen saxatilis, leprosus, croceus.

3. *Placodium lobatum hispidum.**Hairy, lobated Placodium.*

This species has somewhat of the appearance of the platysma, but it's divisions are all fixed down at the edges by cirri, and it's bractæ are of the form of those of this genus. It grows to two or three inches in length, and as much in breadth, but rarely extends itself in a regularly circular form. It consists of a kind of leaves, divided into a number of narrow and oblong lobes, obtuse at their ends, of a pale bluish colour, and furnished all round with long cirri, by means of which they are affixed down to whatever they grow upon. The ramifications are, in general, somewhat convex on their upper side, and hollow underneath; and, those of several plants, which stand near one another, intangling together, there is often met with a crust of this Moss, extending to a vast breadth. The cirri are sometimes black, sometimes grey, and, though they fix down the divisions of the leaves, they do not pull them close to the substance they grow on. The bractæ are very frequent on this species; they grow both from the middle and edges of the leaves; they stand on moderately long pedicles, and are hollow at first, but, afterwards, plain; their middle is black, their edge grey, and this edge, or limb, is sometimes dentated and prominent, sometimes plain; and even some of these plants are found full of little, verrucose protuberances; these are of the same colour with the leaves, and, when cut open, are fungous within. It is frequent on trees and bushes. The common floe-trees about London afford a great deal of it, and old gates and pales are frequently, in a manner, covered with it. Most of the botanical writers have mentioned this species. Columna has it under the very long name of *πλανοπυνοδαυ-φυλλος*; Caspar Bauhine calls it *Muscus arboreus capitulis cavis*; Merret, *Muscus arboreus umbilicatus*; Tournefort, *Lichen latifolius, ramosus, minor, hirsutus*; and Morison, *Muscosungus arboreus, cinereus, scutellatus, marginibus pilosis*. Columna has described it very perfectly; the rest are deficient.

4. *Placodium durius candidum.**White, hard Placodium.*

This is the hardest of all the Placodiæ, but it crumbles to powder, like the rest, if rubbed forcibly between the fingers. It grows in an irregular form, extending to an inch or more in length, and as much in diameter: it is moderately thick, and merely granular, having nothing foliaceous about it's edges. It is usually cracked in several places, and is often covered almost intirely with a grey, farinaceous matter. Among this appear the bractæ, which are small, convex, and of a black colour. It grows on rocks in Wales and Scotland, and is called, by the country people, Cork, Corker, and Kenkerig. The Scotch, and some others, have a way of dying scarlet with it. they prepare the dye by steeping it in urine, much as our orfelle-makers do that from the orfella, or canary-weed. It is highly probable that many other of these crustaceous and tophaceous plants would do the same.

The species of Placodium, beside these, are, in nature, a great many, in authors more: Micheli has not given much less than a hundred, and Dillenius yet more. A great many of the figures of both these authors, however, give us only the different appearances of the same plant, under the names of different species. The more singular ones, beside these, are, 1. The lineated, crusted Placodium, in which somewhat like characters are seen. 2. The pale, crusty Placodium, with brown bractæ. 3. The yellow, lineated Placodium. 4. The Placodium with red tubercles. 5. The large, bracteated Placodium, or crab's-eye Placodium. 6. The black, spangled, leprous Placodium. 7. The areolated, grey Placodium. 8. The lobated, gelatinous Sea-Placodium. 9. The curled, gelatinous Sea-Placodium. 10. The opuntioide, gelatinous Placodium. 11. The transparent, endive-leaved Placodium. 12. The common, blue, curled Placodium. 13. The common, yellow, curled Placodium. 14. The greyish-brown, tree Placodium, black underneath. 15. The blunt-horned Placodium. 16. The grey, flat, black-haired Placodium.

M O S S E S.

Class the Fifth.

Such as produce capsules covered with opercula.

Genus the First.

B R Y U M.

BRYUM is a genus of Mosses, consisting of a stalk furnished with leaves, or of a cluster of leaves, rising immediately from the root; and producing a separate pedicle, with a capsule on it's summit, covered with a smooth operculum, or calyptra, of a conic figure, and containing a fine powder: the pedicle arising either from the center of the radical leaves, or from the summit of the plant, or of it's branches, or, finally, from what was the summit of the plant or branches of the last year, and being somewhat tuberoso at the base, and not surrounded with any particular involucre.

The smoothness of the calyptra distinguishes the Bryum from the polytrichum, and the want of a peculiar involucre at the bottom of the pedicles, as also their growing from the summits only of the branches, distinguish it from the hypnum. Linnæus, attempting to range the Brya according to their fructifications, makes the cylindric figure of the capsule a part of the character; but this is erroneous, for many of the species have it quite round, or globular; some oval, some flattened, and some falcated. This author, according to the doctrine of Micheli, also supposes these capsules to be the antheræ, or receptacles of a farina fecundans, and, consequently, to be the male part of the fructification: but it is wonderful that he was not convinced of the mistake of Micheli in this, by observing, that, in neither this genus, that of the hypna, or any other that produces this kind of capsule, except in the polytrichum only, he could ever find any thing that it was possible to take for a female flower.

To us the matter contained in these capsules appears to be the true and perfect seeds of these little plants, and the farina, or male impregnating matter, to be lodged in antheræ, arranged on the pyramidal bodies, which grow from the top of the capsule, under the calyptra, and which, meeting in a point over it, form what he calls an acuminate operculum.

The species of Bryum are extremely numerous. Dillenius has figured no less than fourscore of them: we shall give descriptions at large of four species, which will express all the variations in the general figure of these beautiful little plants; the rest will easily be understood by one or other of these.

1. *Bryum acaulum calyptra quadrangulari.*

The stalkless Bryum, with a square calyptra.

This species is of the number of those which consist only of a cluster of leaves, arising immediately from the root, with the pedicle supporting the capsule, growing from the midst of them. The first appearance of this plant, in the beginning of winter, is this: a cluster of leaves, eight, ten, or more, spread themselves every way from the root, in form of a radiated star; they are broad, and rounded at the base, and terminate in a point: they are perfectly smooth and glossy, and of a very pale green. Soon after the appearance of these, a fine white pedicle, like a hair, is seen arising from the midst of them, and this, after some time, shews a square calyptra on it's top, covering the rudiments of the capsule: the capsule, some time after, grows to it's full size, and the pedicles, which were at first white, now become reddish, and the leaves, instead of remaining expanded in the figure of a radiated star, collect themselves about the base of the pedicle, and form a sort of bulb there: the calyptra, at first of a pale straw colour, now becomes of a yellowish green, and the pedicles, which before were erect, bend down, in form of a semicircle, or of a larger part of a circle. The calyptra being pulled off, the heads are now found to be of a pear-fashioned shape; they are not ripe, however, till April, at which time they are of a fine gold yellow colour, as are also the pedicles. The capsules, when fully ripe, are somewhat crooked, and the aperture,

aperture, with it's ring and the pyramidal bodies over it, is not in the middle of the capsule, but on one side; when opened, they are found to contain a fine yellow powder. When there is plenty of nourishment for this Moss, it sometimes rises into a kind of stalk, carrying this bulb, which was once the congeries of star-like leaves at the top; this is common also to all the other acaulous Bryæ; so that they cannot, with perfect strictness, be called by that name, though it very well expresses an obvious distinction in the common appearance of the plant. This is so extremely common a Moss, that scarce any of the botanical writers have omitted a description of it. Vaillant calls it *Muscus foliis scutellatis capitulo pyriformi nutante*; Tournefort, *Muscus capillaceus, folio rotundiore, capsula oblonga incurva*; and Dillenius, *Bryum bulbiforme, aureum, calyptra quadrangulati, capsulis pyriformibus nutantibus*. The old authors, in general, call it *Polytrichum aureum minus*, and *Polytrichum Apuleii*. It grows in great abundance on our heaths, and even by way-sides; it thrives best in places where there is moisture.

2. *Bryum stellare, cauliculatum, capsulis ovatis pendulis.*

The starry, cauliculate Bryum, with oval, pendulous capsules.

This is one of the most beautiful of all the genus of Bryums, and appears in the greatest variety of forms of any of them, insomuch that, in it's different states, it has been described under various names, as different species. It is, in it's most general and perfect state, erect and simple; but it is, also, sometimes erect, ramose, and larger, and sometimes procumbent, and so wholly unlike every thing that it has in it's common appearance, that nothing, but the having observed it's changes, could have discovered that these it's several states and appearances were all but the variations of nature in the vegetation of a single plant. In it's perfect state it consists of a fibrous root, a single stalk of about three quarters of an inch high, a pedicle of about the same length, and an oval capsule, bending downwards, and covered with a conic calyptra.

The stalk is furnished all the way up with small, short, and obtuse leaves, approaching, in their figure, toward roundness; at it's summit there grow a cluster of leaves, of a different shape, oblong and pointed, and much larger than the others. These are disposed in form of a radiated star, and, from the center of these, arises the pedicle; which is yellow, it's tuberos base reddish, and the capsule large, and full of a greenish-yellow powder.

Sometimes, instead of a pedicle to sustain a capsule, there arise, from the starry top of the stalk, three or four branches, thick set with long and narrow leaves, very unlike those of the lower part; and sometimes these branches shoot out from the axæ of the leaves of the main stalk, not from it's summit; in either case the plant grows to two, three, or four inches in height, and has an appearance wholly unlike itself in it's former more natural state: but it's most singular appearance of all is, when it trails upon the ground, as it will sometimes do, to the length of three or four inches. In this state it somewhat resembles the trichomenes. It's stalks are roundish, and are furnished with short and roundish leaves on each side, growing smaller as they approach the point; and the stalk sometimes divides at that part, and becomes bifid; sometimes it sends out other branches, and is all the way fastened down to the ground by little roots. The leaves, in all these states of the plant, are smooth and glossy, and, if examined by the microscope, they are found to have their edges finely serrated, and to be terminated by a sort of weak spine.

This species is common in damp places, a little shadowy: Hampstead-heath furnishes abundance of it, and that in all it's states.

Many authors have taken it, in it's creeping state, for a lichenastrum; but Hoffman very judiciously observes, that it may always be distinguished not to be of that genus of plants, by the serrature of the leaves, and by their ending in a kind of spine. Panconius has favoured the error of taking it for a lichenastrum, by figuring it as growing in circular clusters, and with an odd leaf at the end of the rib, or stalk; but this is not in nature: it grows irregularly and scatteredly, and has no odd leaf, it's extremity being either fixed down by roots, or terminated in a scutulated point. Plukenet has figured it in an ill posture, and from a decayed specimen, the leaves being curled up, which they never are while the plant is growing.

Tournefort has described it twice; once under the name of *Muscus palustris foliis subrotundis*, and once under that of *Muscus polytrichoides, polycephalus, chamæscyces folio*.

Hoffman

Hoffman calls it, *Muscus trichomanis facie foliis utrinque rotundis et splendentibus*; and Dillenius, in his *Catalogus Giffensis*, describes it three times, as he confesses in his History; once under the name of *Bryum nitidum foliis serpylli pellucidis subrotundis elatius*; a second time under that of *Bryum nitidum foliis inferioribus serpylli superioribus angustis et oblongis*; and a third under that of *Lichenastrum trichomanis facie*. If so accurate an author as this was deceived by the various appearances of this Moss, there is no wonder that others should describe them as various species.

3. *Bryum cauliculatum capsulis sphaericis.*

The cauliculate Bryum, with round capsules.

This is of the number of those Bryums, whose pedicles arise from the heads of the stalks of the year before; so that, other branches having grown from them, in the mean time, these, till this circumstance is understood, seem to emulate the character of the hypna, and to protrude their pedicles from the midst of the branches. There is, however, another great character which distinguishes all these Bryums, which is, that the pedicle has no foliaceous involucre at the base, as those of all the hypna have.

This very beautiful Bryum grows to about an inch and half in height, without the pedicle; and, several of the plants always growing together, they make a very pretty tuft, sometimes of a foot broad. The young plants are simple, but the taller ones are branched; that is, second and third year's shoots having grown from them, two or three for each year, they appear to be somewhat ramose. The leaves stand extremely thick and close about them, and are oblong, very narrow, and of a carinated form, and of a beautiful pale green colour. The pedicles for the capsules appear in February; some growing from the summits, some from the sides of the branches, according to their several periods of growth. They are fine as hairs, of a reddish colour, and tuberculous at their bottom: the capsules are ripe about May, and soon after fall off; they are perfectly round, and have an obtuse, short calyptra, which generally falls off very soon after they have acquired their full size.

It is not unfrequent on ditch-banks, and readily distinguishes itself there by its fine, bright, green colour, and the largeness of its tufts. It grows plentifully on Hampstead-heath, and about Harrow. Ray has described it under the name of *Muscus trichoides, medius, capitulis sphaericis*; and Morison, under that of *Muscus trichoides, minimus, sericeus, capillaceus, capitulis sphaericis*. Linnæus under that of *Bryum caule recto foliis setaceis capitulis globosis*.

The capsules are made too large in Morison's figure, and in Vaillant's the leaves are too broad; the operculum is figured too acute in them both; it is in nature obtuse.

4. *Bryum ramosum lanuginosum.*

Branched, hairy Bryum.

This is of the number of the Bryums, that are truly and really branched. It is, indeed, as much so, as the generality of the hypna; but the pedicles grow all of them from the extremities only of the branches, not from their sides, and have no foliaceous involucre at the base, which is naked and tuberos, as in the other Brya.

This species sometimes is found single, sometimes in tufts, and those of considerable extent, a great quantity of the plants being entangled one with another. It grows to five or six inches in length, and its stalks are somewhat rigid, yet they do not support themselves erect, but trail upon the ground, and take root at several places. They are sometimes single, sometimes divaricated, and always send off on each side a number of branches, which are sometimes simple, sometimes themselves furnished with others; these branches are closer set with leaves than the main stalks, and consequently they appear thicker. The leaves are very narrow, of a whitish, green colour, and all terminate in long, white hairs at their points; they stand very close together, and quite hide the stalks. From the summits of these branches there proceed pedicles very fine, like hairs, and of a pale yellow colour; they are short, and bear short heads of a somewhat roundish figure, but pointed at the summit, and covered with a conic and sharp-pointed calyptra.

It is frequent on the Alps and Pyrenæan mountains, nor is wanting, in that great resource of the Mosses, England: we have it on Mendip-hills abundantly, and in some other places. The more singular species, beside these, are, 1. The slender, star-top'd Bryum, with round heads. 2. The cruet-shaped Bryum of Dillenius. 3. The fickle-leaved, bending Bryum. 4. The green, clustery, Alpine Bryum. 5. The long-shanked, curled Bryum. 6. The dwarf, long-shanked Bryum, with hairy leaves. 7. The branched Bryum, with pendulous heads. 8. The shrubby Bryum, with long, transparent leaves. 9. The round, transparent-leaved Bryum, with pendulous heads. 10. The small, brittle, whitish Bryum. 11. The Norway Bryum, with a scarlet umbrella-head. 12. The membranaceous, blunt-leaved Bryum.

M O S S E S.

Class the Fifth. Genus the Second.

POLYTRICHUM.

POLYTRICHUM is a genus of Mosses, consisting of stalks furnished with leaves, and producing separate pedicles supporting capsules. The pedicles always growing out of the extremities of the stalks, and the calyptræ, which cover the heads, being hairy, the calyptræ of many of the species are composed merely of a downy matter, and frequently they are deeply dentated at the edges; in the other species, tho' they are membranaceous, they are thick covered with hairs. The leaves of some of the species are rigid, in others they are softer; in some they have a membranaceous appendage at their base, by means of which they embrace the stalk; in others this is wanting.

The pedicles of the capsules, in this genus, are inserted into a tube at their base, which is surrounded with membranaceous leaves. The capsules, in some of the species, are square, in others they are round: the square ones have an apophysis at their base, by which they are connected to the stalk; the round ones have nothing of this. The summits of some of the stalks, which do not produce capsules, are stellated.

These Linnæus calls the female plants, and the stellar part the female flower; but there requires a more perfect discovery than has yet been made of the fructification of these plants, in order to the determining this with certainty.

The Polytricha, in their manner of growth, greatly emulate the brya. Some of them have no stalks, but only a cluster of leaves at the base; some consist of single stalks, some are ramose in the manner of the bryum, from the growth of a second year's shoot upon that of a former; in this case the pedicle arises, as in the bryum, from the summit of the last year's stalk, and seems therefore to arise from the side of the plant, not from it's top.

1. *Polytrichum simplex capsula quadrangulari foliis serratis.*

The square-headed Polytrichum, with serrated leaves.

This is a very tall and large Moss, though it's stem is of the simple kind. It grows to six or eight inches in height; it's stalks are strong and rigid, and it's roots considerably long, spongy, and fibrous. Part of the stalk is usually buried in the ground, and that has short slender leaves, but sparingly set on. The part that is above the surface has, on the contrary, much longer, larger, and closer set ones. They are of a dark, green colour, broadest at the base, and thence tapering to the point; and, when examined very nicely with the assistance of a small magnifying glass, they are found to be very finely serrated round the edges; the stalks sometimes break into two near the top, but it is very rarely. The pedicles of the capsules arise from the center of the leaves that cover the top of the stalk; they are very robust, and two inches or more in length, and are surrounded at the base with a set of leaves, broader, thinner, and more pellucid than those on the stalk; these surround the base of the pedicle closely, and, when removed, discover a purple tube, into which it is inserted. The base of the pedicle is no thicker than the rest, but it is green; the rest is of an orange colour. On the head of the pedicle there first appears a long, slender, and pointed pellicle, covering

vering the embryo capsule; as this grows in magnitude, the calyptra appears more thick, and at length splits. The whole is made up of woolly fibres, without any membrane; when this is taken off, the capsules are found to be square, large, and of a brownish colour; they are filled with a greenish, or yellowish powder.

Among the plants which produce these capsules, there are others with their extremities, radiated in form of a star. Boerhaave first suspected these starry tops to be flowers; and Micheli adopted the opinion, from whom Linnæus has taken it to distinguish the genus by; but all, that we see produced from these starry tops, is no more than young plants like the former, growing as it were out of the head of the old one; they are sometimes seen proliferous in this manner, to the third and fourth degree.

This species grows very abundantly in our woods, and on heaths. Most of the botanical writers have described it under the name of *Polytrichum aureum majus*, and *Muscus aureus capillaris major*. Linnæus, in his *Flora Laponica*, calls it, *Polytrichum caule simplici*. Micheli has been so fond of the opinion of the starry tops being flowers, that he has figured them something more like flowers than nature makes them. In very favourable soils, this plant will grow to a vast length.

2. *Polytrichum ramosum capsula rotunda.*
Branched Polytrichum, with roundish heads.

The squareness of the capsules has been by some made the great distinguishing character of the *Polytricha*; but this species is a perfect *Polytrichum* in it's external form, as well as it's characters, yet it's capsule is round. It grows to two or three inches in height. It's roots are fibrous and tough; it's stalk is rigid and firm; it has few leaves, often none toward the bottom; but in the upper part it is very thick set with them. The stalk generally divides into three or four branches, at about half way of it's height; these are about an inch long. The leaves are oblong, narrow, hollowed, and pointed at the ends. The pedicles arise from the summits of these branches, and are very slender, about three quarters of an inch long, and of a yellowish colour. They are often somewhat crooked: on the tops of these stand capsules of a roundish, or, more properly, of an elliptic figure, being more protuberant on one part than in the rest. The calyptra is of a yellow colour, short and thick, but pointed at the top, and jagged or lacerated as it were at the bottom. The capsules are green at first, but afterwards brown, and at length almost blackish. It's leaves, when examined by the microscope, are found to be lightly ferrated. It grows very plentifully on the Alps, and is found in some parts of England. The mountains of Wales are said, in some places, to abound with it. I have met with it on Mendip-hills.

3. *Polytrichum capsulis rotundis sessilibus.*
The round-headed Polytrichum, with short pedicles,

This is a very singular plant, and would, at first sight, be taken for a Moss of almost any other kind, rather than a *Polytrichum*. It grows to about an inch and half in height; it's stalks are divided into several ramifications, and are all over thick beset with short and broad leaves. They are broadest at the base, and terminate in a point which bends downward, and are pellucid, and of a pale green colour. The tops of the branches are thicker than any other part, and their leaves are often disposed in a stellar form. The pedicles which sustain the capsules are extremely short, and do not grow from the middle of these, but from the bases of the other leaves, and also from the bases of those on the stalks. The capsules are of an oval figure, and are covered with a calyptra, short and pointed, and very hairy, the hairs standing erect, not lying down lengthwise, as in most of the other species.

It is common on the barks of old trees, and also on old walls; sometimes on pales, and the sides of houses. Many of the botanical writers have described it, but few of them have discovered that it belonged to this genus. Ray calls it, *Muscus apocarpus arboribus adnascens minor*. Tournefort, *Muscus capillaceus, minimus, acaulos, calyptra striata*; and Morison, *Muscus humilis tectorum, subfuscus, capitulis brevibus, pileolis erectis pediculis curtis*. Vaillant has figured it, but not accurately.

The other species of *Polytrichum* are, 1. The lesser, square-headed, heath *Polytrichum*. 2. The least hairy *Polytrichum*, with square heads. 3. The branched,
urn-

urn-headed Politrichum. 4. The dwarf, aloe-leaved, round-headed Polytrichum. 5. The dwarf, long-headed, aloe-leaved Polytrichum. 6. The large, short-pediced Polytrichum. 7. The short-pediced Polytrichum, with strait, hollowed leaves. 8. The fine-leaved, curled Polytrichum, with sharp, hairy calyptrae. 9. The dwarf, fine-leaved Polytrichum, with cylindric heads. These are all the really distinct species hitherto known.

The first species, or great Polytrichum, is the only kind that has the honour of standing recorded as a medicine. The opinion of it's having a virtue to make the hair grow thick has been of very long standing, though founded, perhaps, on no better a reason than it's pedicles looking like hair. Tournefort tells us, that it is a very powerful sudorific, and that great cures have been done by it in pleurifies. It is not in use in medicine with us, but we have another use of it. It's roots in boggy ground penetrate very deep, and they make in Suffex a kind of brooms of them.

M O S S E S.

Class the Fifth. Genus the Third.

S P H A G N U M.

SPHAGNUM is a genus of Mosses, consisting of stalks furnished with leaves, and of capsules, in some respects resembling those of the bryum, but without any calyptrae, and standing on so short pedicles, that they do not appear to have any. The pedicles, which support the capsules, grow, in many of the species, from the summits of the stalks, but not in all. Linnæus supposes it to be so in all, and makes it a part of the generical character; but there are genuine Sphagna, or Mosses, with no calyptrae to their capsules, which yet produce them from the sides of the branches. The species of this genus differ very considerably among one another: some of them are very large, others very minute; some branched, others simple.

1. *Sphagnum molle foliis cavis.* *Hollow-leaved, soft Sphagnum.*

This is the largest of all the family of the Sphagnums, and, indeed, is one of the largest of the Mosses in general. It grows to eight, ten, or twelve inches in height. It's stalks are indeed too weak to support themselves singly to such a height, but they always grow in clusters, and so stand tolerably well upright. They are usually single and undivided, but sometimes they divaricate near the top into two; all the way up these stalks there grow short branches, three or four together: these are about half an inch long each, and droop considerably downwards. They are thickest near the base, and smaller to the point; they are thick covered with short leaves, oval, broad at the base, and hollow; they are of a white, or reddish colour, and are placed one over another in the manner of scales. At the top of the plant there stand a great number of the same kind of little branches; they are shorter than the rest, and stand erect, and are placed together in such numbers, that they make a thick and large button at the top of the stalk. The leaves on these are shorter than on the others, and broader at the point. These heads are often redder than the rest of the plant, and sometimes greenish. From the thick top of the plant there arise, in the month of July, capsules; they are round, of a brownish colour, succulent, and in some degree resemble berries, but, when ripe, they shed a fine yellow powder: there do not appear to be any pedicles to these at first, but, as they grow larger, there are seen to be short and slender stalks to support them. These capsules have no calyptra; and another thing in which they differ from those of the other Mosses is, that they remain but a very little while on the plant. They are but a little time in ripening, and in a very little while after they fall off, and may be found scattered about upon the plant, with two holes in each; one in the summit, the other made by the pedicle. While recent, it retains so much moisture, that it is very heavy; but, when dried, it is as remarkably light; it is always very soft to the touch.

It

It grows very abundantly with us on heaths, and in bogs. The plant is frequently met with in immense clusters, but it's capsules are rarely seen. It is common on the bogs on Hampstead-heath.

Many of the botanical writers have described it. Gerard calls it by a very odd name, *Muscus terrestris vulgaris*, a name given by most people else to one of the hypnum. Dodonæus, whom he copies, calls it by the same name; and Parkinson also, *Muscus terrestris vulgatissimus*. Ray calls it, *Muscus palustris terrestri similis*. Linnaeus calls it, *Sphagnum ramis reflexis*; and tells us, that in Lapland they make childrens beds of it. Lobel gave the first figure of it. Dodonæus, Johnson, and Parkinson have copied it. Plukenet's figure is made from a dried specimen, and Vaillant's is rather a pompous than a good one. Dillenius's is far the best extant.

2. *Sphagnum acaulum foliis capillaceis.*

The acaulous Sphagnum, with capillaceous leaves.

This is a species so extremely different, in it's size and appearance, from the former, that it is scarce possible to conceive, at first sight, that they are of the same family; as that is the tallest, this is one of the lowest Mosses that we know of, and it wants every character of singularity in the manner of growth of the former; rather looking like one of the bryums. It's heads, however, when they appear, easily distinguish it, at sight. It seldom grows to more than half an inch in height, often it is much less. It's stalks are very slender also, and it's leaves so small, and so narrow, that they add but little to their thickness. The stalk is usually single, but, as in the large one, it sometimes divides into two or three ramifications. The leaves are short, and of the fineness of a hair; they are of a pale green colour, and those on the upper parts of the stalk are somewhat longer than the others. In April the capsules appear; they are round, of a greenish colour, and have no pedicles; they grow brown afterwards, and, finally, reddish. They remain on the whole summer, and are quite naked, or without calyptræ.

The plant is common with us on heaths, and by way-sides, but it loves a little moisture. Many of the botanical writers have described it. Petiver calls it, *Muscus acaulos trichoides minor*; and Vaillant has given a figure of it.

3. *Sphagnum pennatum planum.*

Plane, pennated Sphagnum.

This is an extremely elegant species, and is very different, in it's general figure, both from the large and the small species already described. The stalks of this grow to three or four inches in length, and divaricate into two or three parts, each sending out also several short side branches. All these, as well as the main stalk, are furnished with a double row of roundish leaves on each side, standing opposite to one another, and giving the plant somewhat of the appearance of a flat hypnum, but more still of a lichenastrum. These leaves are very thin, pellucid, and of a bright green colour. From the axæ of them, at different distances along the stalks, there arise certain little protuberances, formed of small, squamous leaves, of a different figure and consistence from the others; and from the summits of these there grow little capsules, with no calyptræ; they are of a pale yellow colour, and full of a fine yellowish powder. When examined in their places of growth, they appear to have no pedicles; but when the clusters of little leaves, on the summits of which they stand, are opened, there appear short pedicles, which before were buried in these clusters.

It is not a native of England, nor is yet known to be produced any where but in South America; it grows there very abundantly on the barks of old trees.

The species of *Sphagnum*, beside those here described, are, 1. A soft bog-kind, with fine leaves. 2. The bright, green-pointed *Sphagnum*, with oval heads. 3. The rough *Sphagnum*, with red heads. 4. The hoary, nodose *Sphagnum*. 5. The *Sphagnum*, with numerous heads all leaning one way. 6. The undulated, branched, and pennated *Sphagnum*, with hairy heads. 7. The undulated, pennated *Sphagnum*, with plumose heads. 8. The dwarf, bulbous *Sphagnum*. 9. The short and dwarf bulbous *Sphagnum*. 10. The large, bulbous *Sphagnum*, with bristles. 11. The transparent, fine, grass-leaved *Sphagnum*. 12. The creeping *Sphagnum*, with very small heads.

M O S S E S.

Class the Fifth. Genus the Fourth.

M N I U M.

MNIUM is a genus of Mosses, consisting of stalks furnished with leaves, and producing capsules on pedicles rising from them, like those of the other Mosses of this class; and, beside these, on other pedicles, bearing a kind of naked heads of a dusty surface, and having no calyptræ.

These two kinds of heads are, in some species, produced on the same plant; in others on different plants, of the same species.

The pedicles which support the membranaceous heads, or capsules, are long and naked; those which bear the dusty heads are short, and are in some of the species naked also, but in others they are furnished with little leaves. These dusty heads, when examined with a good microscope, are found to consist of congeries of green, foliaceous membranes, expanded in form of roses.

1. *Mnium foliis brevibus carinatis.*

The short and hollow-leaved Mnium.

This is a very small species, and, when in any but it's flowering state, is easily mistaken for one of the little bryums. It grows usually to about half an inch in height, sometimes not so much; and sometimes, in very favourable soils, to an inch. Many of the plants usually grow together, so as to form a large tuft, and that of a pleasant, green colour, and very pretty appearance. The stalks are often simple, sometimes divided into three or four branches; they stand erect, and the leaves are set less thick on them, than on the generality of the Mosses: they are short and sharp-pointed, and of a pale green. In March there arise, from the summits of some of the branches, short and naked pedicles, which support each a head of the dusty kind; these heads are round, of the size of a moderate pin's head, and of a green colour. They soon come to their maturity, and soon decay. From the summits of the other branches there arise about the same time longer pedicles, of a yellowish colour, which support heads of the capsular kind, perfectly resembling those of the bryums; they are oblong, and have their calyptræ like those of the other Mosses, but white at the bottom, and brown at top. These heads are much longer in coming to maturity, than the other heads, and remain a great while longer on the plant.

The dusty heads are very frequent on this plant, but the capsular ones are met with but rarely. The plant is common with us on ditch-banks, and on heaths: where it has a great deal of moisture it grows much larger than in dry places. Tournefort calls it, *Muscus capillaceus minimus, capitulo minimo pulverulento*; and Micheli from Ray, *Muscus trichoides parvus, capitulo conglomerato seu botryoide*. Haller calls it, *Bryum alternans calyptra variegata scyphulis foliosis*. Buxbaum censures Morison's figure, but his own, which he gives in the place of it, is worse. Vaillant has not figured the capsular heads at all, nor have many others who have figured the plant.

2. *Mnium capitulis numerosis.*

Many-headed Mnium.

This is a taller and more robust plant than the former; it grows to two inches in height, and it's stalk is frequently quite simple; sometimes it sends out a few branches, but, when it does, these are always short and inconsiderable. The leaves stand much thicker about the upper part of the plant, than about the lower. They are oblong, narrow, of a dusky green colour, and pointed at the end: the pedicles, which support the dusty, naked heads, are short; they proceed from the axæ of the leaves, and stand very thick; it is common to meet with thirty or forty upon a single plant. These pedicles are short, and are not naked, but have a kind of little, membranaceous leaves, standing pretty close upon them. The heads are small and round,

not exceeding a small pin's head in size; they last but a little time on the plant, and no other heads have as yet been observed upon it.

Dillenius found this Moss dried among Mr Sherrard's papers; and in Buddle's Hortus Siccus, under the names of *Muscus alter botryoides elatior*, and *Muscus pulverulentis forsitan variis capitulis*. I have met with it growing in some damp places on the side of Rook's Hill near Goodwood, the seat of the late great patron of botany, of all the sciences, and of all who studied them.

3. *Mnium repens pennatum*.

The pennated, creeping Mnium.

This is a species so extremely different from the two others, that, at first sight, one would scarce imagine it could belong to the same genus. It rather resembles a *lichenastrum*, or some other Moss of that kind. It never rises at all from the ground, but creeps upon it, sending down fibrous roots from every part. It grows to two inches in length, and generally sends out three or four small ramifications. The main stalk is furnished with a double row of thin and somewhat broad membranaceous leaves, very pellucid, and of a glossy surface. These are so regularly placed, that they give it a pennated look, and are smaller toward the base of the stalk, than in the middle of it, and from thence grow smaller again toward the end; the branches have the same sort of leaves, and disposed in the same manner, except that theirs are largest at the base of the branch, and gradually smaller all the way up: the leaves on these also are narrower, in proportion to their length, than the others. From the summits of these branches there grow little, round, naked, and dusty heads; they are of a green colour, and stand on short pedicles: they last but a little time, and their pedicles fall off with them, so that the plant is usually found without them. No other kind of heads have yet been observed in this species, though frequently met with. It grows much about London, in Cane-wood and on Hampstead-heath; but it has not been described by any author, except Dillenius, who acknowledges, that he met with the first mention of it in some manuscript notes of Mr Doody's.

Haller is for referring the species of this genus to the bryums; and most of the authors, who have written about them, determine the capsular heads to be the male part of the fructification, the dusty ones the female; but the frequency of the latter, and the scarcity of the former, plead much against it, and their time of appearance more so: when both are found on the same plant, the dusty ones are generally decayed, and fallen off, long before the capsular ones have arrived at their maturity.

The species of *Mnium*, beside those here described, are, 1. The transparent, serpyllum-leaved *Mnium*. 2. The larger, upright, and forked bog *Mnium*. 3. The transparent, trichomanes-like *Mnium*, with divided leaves. 4. The lichen-leaved *Mnium*, improperly made a new genus by Micheli and Linnaeus, under the name of *Blasia*; and 5. The short, irregularly-branched *Mnium*.

M O S S E S.

Class the Fifth. Genus the Fifth.

FONTINALIS.

FONTINALIS is a genus of Mosses, consisting of branches furnished with leaves, and producing also capsules of the membranaceous kind, covered with calyptræ, but having no pedicles, or very short ones: they are inclosed in a sort of vagina, or cup, of a squamous structure, and produced in the alæ of the leaves.

The Fontinales are but few in number, and are very regular and similar one to another in their manner of growing. There are only five known species, and they are all of the ramosè kind.

1. *Fontinalis foliis latioribus*.

Broad-leaved Fontinalis.

This is a very large Moss, and very conspicuous in it's manner of growing. It is usually affixed to some solid matter, in or at the side of the water, and floats at length from

from that. It grows to five or six inches in length; its stalk is brown, or blackish, very firm and strong, and divaricates usually into six or eight ramifications. The leaves are oblong, broad, and of a fine green colour, smooth and glossy, and considerably pellucid. They do not stand so thick as the leaves of many the Mosses do: they are small toward the bottom of the stalks, largest in the middle, and small again toward the extremity, where they sometimes also are convoluted so as to form a kind of point. They are broadest at the base, and, from thence, grow smaller gradually to the point, and are placed in such order, that they give the plant a kind of triangular figure. The capsules grow from the middle to the lower part of the branches; there arise from the alæ of the leaves, in this part, a kind of membranaceous vagina, or cups, of an oval figure, open at the upper part; and, from this opening, there appears the top of a membranaceous capsule, like those of the other Mosses, covered with its calyptra: within the vagina, there is contained an oblong capsule, wholly like those, its aperture being surrounded, as in the other, with a number of pyramidal bodies, visible, when the calyptra is taken off. These capsules stand on extremely short pedicles, they appear to have none at all. There are a few membranaceous leaves at their base; and the whole vagina, when examined, is found also to be composed of such membranes, laid over one another, like scales, in so nice a manner, that the whole seems to constitute only one membrane. This species is very common in brooks and rivers about London, and elsewhere; in standing waters it is sometimes rooted in the mud; in running ones it always affixes itself to wood, or to some other solid substance.

Most of the botanical writers have described this species; C. Bauhine calls it, *Muscus aquaticus folio expanso*; Ray, *Muscus aquaticus triangularis*; Læfeli, *Muscus aquaticus denticulatus*; and Dillenius, in his *Catalogus Giffensis*, *Selago aquatica, foliis pellucidis, triangularibus, acutis, complicatis cincta*; but, in his succeeding edition of Ray's Synopsis, and in his *Historia Muscorum*, he distinguishes it for a *Fontinalis*.

2. *Fontinalis foliis lanceolatis*.

The Fontinalis, with lanceolated leaves.

This is a smaller species than the former. From the same root it usually sends up a great number of small and slender stalks; they are of a brownish dusky colour, and very tough and strong. They grow to three or four inches in length, and are sometimes single, sometimes divided into two or three branches. The leaves do not stand so thick as in many of the other Mosses; they are small, narrow, and obtusely pointed, and stand in two rows, one opposite to the other. They are of a pale yellowish, green colour, as is also that part of the stalk which is near the summit. From the alæ of the leaves there arise very short pedicles, which support oblong capsules, with their calyptræ on the summit, and with a tender membraneous vagina, or cup, at the base, which falls to pieces very easily.

It is an American Moss, and not known any where there but in the hotter countries. Plumier has described it under the name of *Muscus linariæ foliis acutissimis*. It grows up out of the mud, in the bottom of standing shallow waters.

3. *Fontinalis foliis capillaceis*.

Capillary-leaved Fontinalis.

This is a very beautiful species. It grows to six or eight inches in length, and sends out a number of branches, which are usually single, but sometimes divided into two or three ramifications. The leaves stand very close and thick; they are oblong, extremely narrow, and hollowed toward the base, and are of a dusky green in the young branches, and of a blackish hue on the larger stalks. From the alæ of the leaves, and particularly about the origin of the ramifications, there grow a peculiar kind of vagina, composed of membranaceous leaves, folded together, and, at first, terminating in a sharp point. These vaginæ are remarkably long, and, after they have appeared some time, they open at the point, and there appear capsules of a roundish figure, like those of the other Mosses of this class. There is no apparent pedicle to these capsules, but, when the vagina is opened, a pedicle is found running down its whole length. The whole plant has much the appearance of a hypnum, but its singular vaginæ sufficiently declare it to be a *Fontinalis*.

It grows in standing waters, sometimes in rivulets, and is very common in North America. Dillenius is the only author who has described it; he received specimens of

it from Pennsylvania, gathered there by John Barham, at the same time that mine and those of all the other botanical people who have it were sent over.

There are only two species of Fontinalis known, beside those here described: these are, 1. The smaller, triangular-leaved Fontinalis, with capsules at the summits of the branches. 2. The fine-leaved, blackish, glossy Fontinalis.

M O S S E S.

Class the Fifth. Genus the Sixth.

HYPNUM.

HYPNUM is a genus of Mosses, consisting of stalks and leaves, and producing membranaceous capsules, like those of the rest of this class: these capsules stand on pedicles, which grow from the alæ of the leaves, and have, at their base, a kind of squammos covering, formed of a matter quite different from the leaves of the plant. The capsules of the Hypnum all have their calyptræ: they are of different shapes, but usually oblong, and the pedicles on which they stand are usually long also. The squammos involucre, at the base of the pedicle, is called by Dillenius perichætium, and is the great characteristic of the Hypna, no Mosses of any other genus having it in this form. The Hypnum is a very large genus; Dillenius has described no less than seventy-six species of it: some of these, however, are but varieties of the same plant, under different states. The Hypna, in general, are large Mosses, and are branched; some of them, however, want this obvious character, as some of the bryums also are branched, and, at first sight, resemble the Hypnums.

1. *Hypnum ramosum foliis triangularibus minoribus.*

Branched Hypnum, with small, triangular leaves.

This is the Moss properly called Muscus terrestris vulgatissimus. It is by much the most common of all the Mosses. Some authors have distinguished it by this name, but most others have called other Mosses, neither common, or of the land kind, by it, as the great sphagnum, &c. The stalks of this Moss grow to six or eight inches in length; they usually divaricate into several ramifications, and each of these sends out, also, other branches, which are simple, and of half an inch, or more, in length. The whole plant is covered with short and small leaves, very thick set, and falling like scales over one another: they are of a triangular figure, broad at the base, and terminate in a point. They are of a pale yellowish-green colour, and of a shining surface. From the alæ of the leaves there rise pedicles of two inches in length, slender, glossy, and of a reddish brown colour; these sustain capsules of an oblong figure, and these are covered with a calyptra, and contain a fine greenish-yellow powder.

It is extremely common on barren ground, and under hedges, but the capsules are not frequent on it; ten thousand clusters of the plant may be examined, before there are any of them found.

Most of the botanical writers have described this species. Ray calls it, Muscus terrestris latioribus foliis, five vulgaris; and Tournefort, Muscus squammosus ramosus.

2. *Hypnum erectum rigidum, capsulis cernuis.*

The rigid, erect Hypnum, with cernuous heads.

This is an extremely different plant from the former in it's general figure; as that is procumbent and weak, this stands erect, and it's stalks are firm and rigid. It rises to three or four inches in height; it's stalks are of a blackish colour, and are almost naked for one half of their height, having in this lower part only a few yellowish membranes, here and there upon them; from this part they begin to send off branches, which, in the whole, are very numerous; and these again send off others, so that the whole plant much resembles a tree, whose trunk is naked, but it's head very full of boughs. All these branches, as well as the main stalk of the plant from this height, are thick covered with leaves, broad at the base, and terminating in a point; they are short, and of a dark green colour. The root is creeping, and sends up a number of

these plants, one near another, The pedicles, which sustain the capsules, are about three quarters of an inch long, of a reddish colour, and the capsules short and tumid: they do not stand erect, but lean a little.

This beautiful little Hypnum is common in woods, about the roots of old trees; Charlton-wood, near Woolwich, abounds with it. The botanical writers in general have described it. Tournefort calls it, *Muscus squammosus, dendroides, radice repente*; and Pontedera, *Muscus squammosus, dendroides, ramosus, squammis hinc inde eleganter dispositis*. The *Muscus aquaticus pennatus frutescens* of Morison is also a variety of this species, though very ill figured.

3. *Hypnum filicinum cristatum.*
Fern-leaved, crested Hypnum.

This is an extremely elegant little plant: it grows, at the utmost, to about an inch and half in length. It consists of a single stalk, strait, slender, and curled at the extremity, which sends off, on each side, a series of branches, of about a third of an inch in length in the middle, and growing gradually shorter as they approach the end; the extremities of these branches are curled back, in the same manner as those of the main stalk, and both that, and these, are covered with leaves, standing very thick upon them. These are small, and of an oblong figure, pointed at the end, and crooked, in the same manner as the stalk: they are of a yellowish colour, and the bending of these, and curling of all the branches, gives the plant a very beautiful, crested appearance. From the *alæ* of the leaves, in several parts, there arise pedicles, sustaining capsules; the pedicles are about half an inch long, and the capsules are short and tumid, of an oval figure, and brown colour. The regular disposition of it's branches gives it much the appearance of a fern, and the curling makes it resemble the crest of a helmet.

It is not uncommon with us, on heaths, and about the stumps of trees, and the bottoms of old walls: it is also frequent in other parts of Europe, and in North America. Bobart first found it in England, and called it, *Muscus terrestris, repens, subflavus, foliolis crispis, minoribus ramulisque dense confertis*. Boerhaave calls it, *Muscus repens, ramosus, pennatus, subtilissime divisus, foliis crispis reflexis*.

4. *Hypnum pennatum basi capsuliferum.*

Pennated Hypnum, producing it's capsules from the base of the leaves.

This is one of the smallest of the Hypnums, and has so little the appearance of the rest of the genus, that nothing but an examination of the fructification of it could distinguish it's belonging to it. It consists of a single leaf, of about half an inch in length, and of a pennated form, consisting of a double row of pinnulæ, about eight or ten in each row; but these not separate, and affixed to a rib, but formed only of divisions, or segments, of one common leaf: there are usually five or six of these leaves growing from one root. They are of a deep green colour, and glossy surface, and are somewhat pellucid. From the base of each of these leaves there arises a single pedicle, about half an inch in height, and of a brownish colour, covered with a membranous perichætium at the root, and sustaining, at it's top, a small, oblong, and tumid capsule, not standing erect, but leaning a little, but covered with a calyptra, the point of which turns upwards; the capsules are green, at first, but brown, when ripe. The leaves have each a slender rib running all along it, and are sometimes broader, sometimes narrower, but a seventh of an inch is about their usual breadth. Many of the botanical writers have described this Moss, but they have thought of very different titles to express the shape of it's leaves by. Ray calls it, *Muscus filicifolius, seu pennatus minor*; and Dillenius, *Hypnum taxiforme*. Vaillant calls it, *Muscus pennatus capitulis adianti*; and Clayton, in Gronovius's *Flora Virginica*, *Lichenastrum foliis erectis, pinnatis, saturate viridibus*. It grows very abundantly in our woods, and on heaths, especially where there is a moist soil.

The other more singular species of Hypnum are, 1. The transparent, bird's-foot-leaved Hypnum. 2. The large, shining, membranaceous, water Hypnum. 3. The large, shining, firm Hypnum, with tamarisk leaves. 4. The curled, fern Hypnum. 5. The undulated, pennated Hypnum, with short pedicles. 6. The great, scorpion, creeping, bog Hypnum. 7. The lesser, upright, scorpion, bog Hypnum. 8. The great, triangular-leaved, upright Hypnum. 9. The long, sharp-leaved,

leaved, floating Hypnum. 10. The blunt, cypress-like Hypnum. 11. The finer, cypress-leaved Hypnum. 12. The long, pedicled, shrub Hypnum, with erect heads. 13. The slender, silky Hypnum, with pointed heads. 14. The black, water Hypnum, with hooked leaves. 15. The round, branched, dark green Hypnum. 16. The square-branched Hypnum. 17. The smallest, fern Hypnum, with tamarisk leaves. 18. The fine, float Hypnum, with small heads. 19. The small, creeping, club Hypnum, with short pedicles. 20. The short-shanked, mouse-tail Hypnum.

M O S S E S.

Class the Sixth.

Such as produce capsules without pedicles, and without calyptræ.

Genus the First.

L Y C O P O D I U M.

LYCOPODIUM is a genus of Mosses, consisting of branches, furnished with leaves, and producing spikes, formed of squammæ, of a different figure from the leaves; at the bases of which there are placed capsules, of a kidney-like shape, which have no cup, or vagina, and, when ripe, open longitudinally into two parts, and discharge a great quantity of fine powder; and having no other visible seed.

The Lycopodia have all one general appearance, by which they may be distinguished to belong to the same family; but some of them have their spikes supported on peculiar pedicles, some have them continuous to the rest of the stalk. The species of this singular genus are not very numerous, but they are, in general, very beautiful.

1. *Lycopodium repens angustifolium hirsutum.*

Creeping, narrow-leaved, hairy Lycopodium.

This is the most frequent species of Lycopodium with us, and is known by the name of the Common Lycopodium, or Wolf's-Claw Moss.

It does not grow erect, but creeps flat upon the ground, extending its branches to a great length, and divaricating a great many ways; pieces of a yard, or more, in length, may be taken up, if raised carefully, without breaking: these ramifications all send out numerous roots, as they creep along the ground, and are very thick beset with leaves; these are narrow, oblong, and terminate each in a long white hair. They are of a pale green colour, and bend a little backwards. The branches are produced from the main stalk, in an alternate order, and the extremities of the branches are thicker, and, from the alæ of the leaves, near their intersections, arise the spikes, which are rough, and more hairy than any other part; it is these thick ends of the plant that have given occasion to its name of Wolf's Claw Moss, not the spikes from the tops of the branches. The spikes have no pedicles at first, but, before they arrive at their maturity, they are raised from the plant by pedicles of two inches, or more, in height. These are sometimes ramose, but usually single. The squammæ which form the spikes are broad at the base, and terminate in a fine white hair; the spikes are about an inch long, and a sixth of an inch, or more, in diameter; the capsules are large, and shaped like a kidney, and are lodged in the alæ of the squammæ of the spike. It is a common Moss in many parts of England; the heaths in Suffex afford it abundantly; it used also to grow on Hampstead-heath, but it is lost there now. Most of the botanical writers have described it under the names of Lycopodium vulgare, and Chamæpuce: some have called it, Muscus terrestris clavatus, and others, Cingularia.

2. *Lycopodium digitatum spicis quadruplicibus.*

Digitated Lycopodium, with four-fold spikes.

This is an extremely singular and elegant Moss. It grows to a foot, or more, in length, and is erect, not procumbent, as the common kind. Its radical stalk creeps on the surface

surface of the earth, and sends down a multitude of fibres; from this there rise, at an inch or two distance, stalks of six or eight inches high; they are roundish, and are covered with small leaves, or squammous membranes. These send out, on every side, a kind of digitated branches, an inch or two in length, and extending as much in diameter. They issue single from the stalk, but they divaricate into six or eight ramifications, which, dividing again each into two at the extremity, form, in the whole, a very elegant cluster; these ramifications are thin and flattish, but somewhat convex on the upper side, and concave on the under. They are of a yellowish-green colour, and, in some degree, resemble the leaves of the arbor vitæ; they are very tough and firm, and each is composed of a middle rib, thus divaricated, and covered with small leaves, broad at the base, and narrower to the point, pressed closely down upon it. From the upper parts of the plant arise pedicles of three, four, or more inches long, each divided into two branches at the summit, and each of these branches divided into two again; at the top of each of these last ramifications there grows a spike, slenderer than that of the common Lycopodium. The pedicles have a few squammous leaves on them, and the spikes are composed of squammæ broad at the base, short, and terminating in a point; in the alæ of these are placed capsules, of a kidney-like shape, filled with a fine yellow powder.

It is a native of North America: Pennsylvania and Virginia produce it in abundance: it produces it's spikes in August and September.

The other species of Lycopodium are, 1. The savin-like Lycopodium, called Cypress Moss, and the Heath Cypress. 2. The tall, double-forked Lycopodium of the East-Indies. 3. The great, slender, spiked, East-Indian Lycopodium: this grows to three feet in height. 4. The small, creeping Lycopodium, with single spikes, and extremely long pedicles. 5. The short, creeping Lycopodium, with single, upright spikes. 6. The fox-tail Lycopodium, sending roots from it's branches. 7. The juniper-leaved Lycopodium, with no pedicles to the spikes. 8. The fine-leaved, curled, shrub Lycopodium, with short, drooping clubs, or spikes: and, 9. The sharp, square-spiked, hoary Lycopodium: both these last also have spikes without any pedicles.

M O S S E S.

Class the Sixth. Genus the Second.

TRISPERMIUM.

TRISPERMIUM is a genus of Mosses, consisting of stalks, furnished with leaves, disposed in three regular series; two series or rows of larger and broader placed opposite to one another, in the same plane, on the two sides of the stalk; and a third series of smaller leaves covering the upper part of the stalk, or rib, between the other two; and producing spikes, sometimes with, sometimes without pedicles; which spikes contain capsules of two kinds, those of the one kind holding only a powder, and those of the other containing each three seeds. The spikes of these Mosses are less different from the rest of the plant in their structure than those of the lycopodium, and in many of the species, after a certain period, become undistinguishable from the stalks on which they grow. Dillenius has called this genus, from the resemblance it's spikes bear to those of the lycopodium, Lycopodioides. It seems properer to distinguish them by a name which expresses the great singularity of it's producing seeds, three in a capsule.

1. *Trispermium spicis brevibus sessilibus.*

The short-spiked Trispermium, without pedicles.

This is a creeping Moss; it's branches lie flat upon the ground, and extend themselves to five, six, or more inches in length, and to as much in breadth; they send out numerous ramifications, and these subdivide themselves again into smaller. They send out roots in several places, and are ornamented on each side with a row of broad and obtusely-pointed leaves, and with a row of somewhat shorter and smaller between them. The spikes are short and small; they grow from the extremities of the

the young branches, without any pedicles, and generally grow two from the same base. They are clothed with squammæ, much resembling the leaves of the plant in shape, and, at the bases of these, there stand capsules of a roundish figure, bivalve, and containing a fine powder: beside these, there are also other capsules, not only placed in the alæ of the other squammæ of the spike, but also in the alæ of the leaves of the plant; these are small, and scarce visible, at first; but, in fine, they increase to a considerable size, and each contains three round and tolerably large seeds. As these increase in size, they thrust out the leaves from the stalk, and, the squammæ of the spikes, at the same time, growing larger, the spikes themselves become undistinguishable from the branches of the plant.

It is a very scarce plant: it has been talked of as growing in England, but it does not appear that there ever was any better foundation for this opinion than people's mistaking some other plant for it. Clusius received it from Portugal, and figured it: almost all the late authors have copied his figure, and know no more of the plant than what they collect from him. Dr Shaw, indeed, found it in the East, and it has since been discovered in South America. It grows in moist, stony places. Most of the old authors have described it under the name of *Muscus denticulatus*, and *Muscus terrestris Lusitanicus*. Ray calls it, *Muscus denticulatus minor*; and Buxbaum, *Lycopodium parvum, herniariæ foliis*; he has a good figure of it, but erroneously calls it a new-discovered plant. Lobel says it grows on Mendip-hills; and Merret, in Lancashire; but no body ever found it in either of those places.

2. *Trispermium spicis longioribus pediculatis.*

The Trispermium, with long spikes on pedicles.

This is a very elegant Moss, of the creeping kind. Its branches lie close upon the ground, and are divaricated every way into a number of ramifications, which often divide again into still smaller; every branch has three series of leaves on it; two of larger, placed opposite to one another, and a third of smaller, covering the rib between them. They are broad at the base, and have no pedicles, and are placed rather alternately, than exactly overagainst one another. The middle series of leaves is, as it were, double, one small leaf growing at the base of every larger one. These are narrower, as well as shorter, than the others, and are smooth; the others are a little curled, or crooked. From several parts of the branches there arise pedicles of an inch long, each sustaining sometimes a single spike, sometimes two, sometimes three, of the same length with their pedicles, and somewhat thicker, but not much so; these are composed of oblong squammæ, convex on one side, and concave on the other, and of a yellowish colour. At the bases of these there are affixed bivalve capsules, containing a fine powder, and, on the branches themselves, as well as at the bases of the lower squammæ of the spike, there are also other capsules of an oval figure, each containing three small seeds: these latter capsules are much smaller than the others, and are much less frequently found on the plant.

It is found on the Alps, and in many parts of Switzerland. It has been said to be a native of England, but we do not find it here at present, and, probably, those, who mention it's being found with us, took some other species for it. Ray describes it under the name of *Muscus denticulatus major*; and Tournefort and most of the other botanical writers call it by the same name; but some call it, *Denticulatus minor*; and many have wrongly asserted, that it is the same species with the former: the difference of the spikes sufficiently proves the contrary.

3. *Trispermium erectum spicis triangularibus.*

Erect Trispermium, with triangular spikes.

This is a species of *Trispermium* extremely different, in its general figure, from the foregoing kinds: it is an erect, robust, and large plant. It grows to a foot, or more, in height; its stalk is very tough and firm, and carried up single for about four inches, during which space it is covered with a few scattering squammæ. From this height it begins to send out branches in great numbers, which ramify again, and form, upon the whole, a plant with much of the external appearance of a fern. The branches all have, on each side, a row of leaves, short, and moderately broad, rigid to the touch, of a smooth surface, and of a beautiful green colour; and, between these two rows,

is another series of smaller leaves, covering the upper side of the stalk, but the opposite side is bare.

The extremities of the branches in this species are terminated by short spikes, of a square figure, and without pedicles. These spikes are slender, and are composed of small squammæ, hollow, broad at the base, and terminating in a point. At the bases of these squammæ there stand capsules, which are bivalve, and are some of them filled with only a fine powder; others of them contain three white roundish seeds each: one of these capsules stands at the base of every squamma, where there is not one of the others.

This species is of American origin, and has not been met with any where in Europe. Petiver and Ray describe it under the name of *Muscus denticulatus major Caledonicus*, perelegans, filicis in modum pinnatus. Plukenet calls it, *Muscus squammosus erectus*; and Dillenius, *Lycopodioides dentatum, erectum, filicinum, caule tereti ramosissimo*.

The other species of the *Trispermium*, described by authors, are, 1. The creeping, denticulated *Trispermium*, with footless spikes. 2. The shrubby *Trispermium*, with loose and naked spikes. 3. The upright, acacia-leaved *Trispermium*. 4. The small, erect *Trispermium*, with fern-like leaves. 5. The spleenwort-leaved *Trispermium*. 6. The furcated, yew-leaved *Trispermium*. 7. The smaller, stiff *Trispermium*, with denticulated leaves. 8. The scaly *Trispermium*, with curled points. 9. The spreading, forked *Trispermium*. These are most of them of American origin.

M O S S E S.

Class the Sixth. Genus the Eighth.

SELAGO.

SELAGO is a genus of Mosses, consisting of branches furnished with leaves, and producing capsules in the alæ of the leaves, which have no pedicle, nor any calyptra, but are formed of two valves, and have a single cavity in them, containing a fine yellowish powder.

The several species of *Selago* are all robust and shrubby plants, in respect of the other Mosses, and their branches are generally divided dichotomously.

1. *Selago erecta longifolia.*

Long-leaved, upright Selago.

This is a robust plant, it grows to four or five inches height, and sometimes more. It rises with a single stalk from the root, but this soon divides into two branches, and each of these into two more. This is the most frequent state of the plant; but it sometimes is more, sometimes less divided, though always in this dichotomous manner. The stalks are covered very thick with leaves, especially toward the top, so that they usually appear larger there than at the bottom. The leaves are narrow, oblong, and pointed; they are a little convex on the outside, and concave on the inner, and they are of a yellowish colour. The stalks are considerably thick, and, where they are naked, are seen to be brownish. In the alæ of the leaves, from the bottom to the top of the plant, there stand in autumn little capsules, which, when they are opened, are found to contain a fine yellow powder. They are of a kidney-like shape, and naturally open longitudinally; about the time that the capsules are full grown, it is common to see little oblong, cristated bodies, composed of six segments standing out about the tops of the branches; these seem to be embryo plants, ready to fall to the ground, and take root.

It is a common plant on some of the Welch mountains, and in some parts of Yorkshire and Derbyshire; elsewhere, with us, it is very scarce: abroad it grows abundantly on the Alps, and other mountains. Most of the botanical writers have described it. Ray, Bobart, and many others have called it, *Muscus erectus abietiformis*. Tournefort, *Muscus squammosus abietiformis*; and others, *Selago foliis et facie abietis*.

2. *Selago foliis angustissimis confertis.*
The narrow, cluster-leaved Selago.

This is a very tall and robust plant. It grows to twelve or fourteen inches high; its stalk rises single from the root, and is at the bottom but moderately thick, yet very robust and strong; up somewhat higher it grows considerably thicker, and divides into two branches: each of these, after they have gone up single three or four inches, divide again into two, and these ramifications, finally, into two more. The division is sometimes carried yet farther, but this is the usual state of the plant; all the branches are covered with a number of oblong, narrow, and pointed leaves; those on the lower part of the stalk are shorter than the rest, and bend more downward. The others are longer, and, though not quite erect, yet droop but very little. In the axæ of the leaves, from the top of the plant down to the base of the second ramification, there are placed capsules of a kidney-like shape; these are composed of two valves, and opening longitudinally, when ripe, they throw out a quantity of a fine yellow powder. The whole plant is much of a thickness, from the first ramification to the very summit of the branches.

It grows in many parts of America, in their damp morasses, and in some of their forests. Plumier has described and figured it under the name of *Muscus squammosus maximus, erectus, sabinae folio*, though perhaps erroneously, by the fault of the press, for the leaves are not at all like *savin*. Dillenius has much better named it, *Selago coridis foliis reflexis*.

3. *Selago foliis brevioribus.*
Short-leaved Selago.

This is the weakest of all the *Selago* kind, yet it frequently stands quite erect, tho' it grow singly, and rise to ten or twelve inches in height. Its stalk is of the thickness of a small packthread at the base, and is pretty thick, covered with leaves down to the very ground. It continues of much the same thickness nearly to the top, where it ends somewhat smaller. It generally divides, at about half its height, into two parts, and each of these divides again, once at least; besides this also, it sometimes sends out branches near the middle of its height, and these always divide into two parts, and those sometimes are divaricated again near their tops. The leaves that surround the stalk near the base are very short, and brownish; those on the rest of the plant are of a yellowish green, and, though shorter than in any of the other species, yet are of an oblong figure, broadest at the base, and pointed. From the top of the plant, to near the first division of the main stalk, there are placed capsules, not of a kidney-like shape, but oval, which divide, when ripe, into two parts, and shed a quantity of a fine yellow powder.

Plumier first figured this species; he calls it, *Muscus squammosus maximus coridis folio vitriculis longioribus*. Tournefort calls it, *Muscus squammosus Americanus maximus*. Dillenius calls it, *Selago foliis camphoratae*. It is of American origin; it grows in their forests, about the stumps of trees.

There are only three known species of *Selago*, beside these described here. Those are, 1. The toadflax-leaved, great *Selago*, which grows to two feet or more in length; and, 2. The American *Selago*, with reflex, denticulated leaves. 3. The large, Indian, fir-like *Selago*.

A Moss, under the name of *Selago*, has been known in medicine, in the very earliest ages. Pliny tells us, that it was collected, with great superstition, for magical uses; and that the fume of it was good for diseases of the eyes. There appears great reason to believe, however, that not any of the plants we call *Selago*, at this time, but the *Lycopodium sabinae facie*, was the *Selago* of Pliny and the antients: they all agree in telling us, that it was like *savin*; and none of our species of *Selago* are at all like *savin*, though that *lycopodium* is.

Our common *Selago* of Wales is of a strong taste, and that of a very peculiar kind. It is sometimes taken in decoction, by the country people, in their diseases: it operates very violently, both by vomit and stool. They use a decoction of it also to kill lice. It is said also to destroy worms in the bowels, and to promote the menses. In Germany it is a common purge for horses; and indeed, by the accounts handed down to us of its operations, it seems a much properer medicine for horses than for men.

MOSSES.

*M O S S E S.**Class the Sixth. Genus the Ninth.**POLYCOCCA.*

POLYCOCCA is a genus of Mosses, consisting of branches furnished with leaves, and producing in the alæ of those leaves capsules of a roundish figure, which, when ripe, open some into three, and some others into four valves, and contain accordingly either three or four regular seeds. Dillenius, from the resemblance of this genus to the selago, calls it, Selaginoides; it seems more expressive of it's character to name it from the number of divisions of it's seed-vessel, and the number of seeds contained in it.

There is only one known species of this genus, which is the plant our botanical writers have called by the English name of Seeding-mountain Moss.

P O L Y C O C C A.

This singular plant consists of procumbent branches, divaricated in various manners, and taking root in several places, as they creep along. These are covered with small and short leaves, placed alternately. They are of a pale green colour, broadest at the base, and terminate in a prickly point; they are rigid to the touch, somewhat hollowed at the base, and bent a little backwards; and, when nicely examined, their edges are seen to be beset with the small prickles, like those of the points. The extremities of the branches are some of them slender; but others are thicker than the rest of the plant, and form a kind of squamose and foliaceous heads: these, the succeeding year, grow larger, and produce seeds. At the time when they thus protuberate, there are no seeds, nor any thing of fructification visible in them, but they are covered with leaves larger than the rest, and, like those of the seeding-shoots, are more hollowed than the rest. These seeding-shoots grow up in the manner of spikes, from the several parts of the branches; they are an inch or two long, and sometimes more; and they are furnished with leaves resembling those of the branches, but larger, hollower, and more visibly spinose; they are of a paler colour also, and are placed alternately at small distances.

In the alæ of these leaves are placed the capsules; they are large, and stand upon no pedicles, and are tricoccous, or quadricoccous, each containing either three or four seeds of the size of poppy-seeds, and of a whitish colour.

This plant has been described by most of the late botanical writers. Merret calls it, *Muscus erectus polyspermus*. Ray, *Muscus terrestris polyspermus*. Tournefort, *Muscus erectus, squammosus, polyspermus*. Linnæus calls it, *Lycopodium caule repente ramis spica foliis patula instructis*.

It grows in wet places among stones, on the Welch mountains, and in some parts of Yorkshire, as well as in Lapland, and most of the northern parts of the world. The capsules are produced in June, and remain on the plant till winter.

*M O S S E S.**Class the Sixth. Genus the Tenth.**O P E C A.*

OPECA is a genus of Mosses, consisting of branches furnished with leaves, and producing in the alæ of the leaves capsules, which have no pedicles, nor any calyptræ, and which, when ripe, have several foramina in different parts of them, through which they discharge their contents.

There is only one known species of this genus.

O P E C A.

This is a very beautiful Moss; it grows to five or six inches in height. It's main stalk sends off, on each side, several branches, which send off each several others; these

these stand alternately, and they, as well as the main stalk, are furnished with leaves set very thick, in an alternate order, opposite to one another. They are of a fine green colour, smooth on the surface, and pellucid; in shape broad, and obtuse at the ends; they are so disposed, that they give the branches a pennated appearance: they are convex on one side, and hollow on the other; and in this hollow part, near the insertion of the branches, they contain capsules which are small, of an oblong figure, and surrounded at the base by several little membranes. These capsules are composed of a thin membrane, including six globular bodies, three on each side, and opposite to these as many foramina, or holes, out of which, when ripe, they discharge a fine powder.

It is a native of America; the only specimens ever seen of it, in this part of the world, have been sent by John Bartram, from Pennsylvania. Its capsules are ripe in January. Dillenius has described it under the name of *Porella*; no other author has mentioned it.

M O S S E S.

Class the Seventh.

Such as consist of foliaceous matter, with evident fructifications arising from it.

Genus the First.

M A R C H A N T I A.

MA R C H A N T I A is a genus of Mosses, consisting of a congeries of foliaceous matter, on the several parts of which there are separate male and female parts of fructification. The male flower is placed on a long erect pedicle, arising out of a kind of vagina. Its cup is a perianthium, large, flat, and divided into eight or ten equal segments, and contains under it as many flowers, as there are segments. The corolla is monopetalous, turbinate, and shorter than the cup. The stamen is a single filament, undivided, and larger than the flower: the anthera is of an oval figure, and divides from the top into as many parts as there are segments in the cup: the farina is affixed to filaments. The female flower stands on the same plant, but does not rise from the surface: its calyx is a perianthium, consisting of one leaf of a membranaceous substance, permanent, and of the figure of a cup, or funnel, serrated round the edges, and divided into two cavities, by a membrane which runs across its middle; in the lower cavity of this cup there are contained several naked seeds, of a roundish, but compressed figure.

1. Marchantia imbricata foliis brevibus.

Short-leaved, imbricated Marchantia.

This species generally forms a cluster of leaves of an irregular and indeterminate figure; the leaves are short, moderately broad, and irregularly lacinated about the edges. They are of a dusky, disagreeable, green colour, and do not shine as those of some other of the species of this genus do. They have no visible veins on the upper side, but they are very thick set with lanuginous fibres, which serve as roots on the under side. They generally grow a great number together, one falling over another. They are fixed down by the roots quite to the edges, and, when closely examined, they appear of a reticulated texture, and the areolæ between the reticulations punctated. The pedicles sustaining the male flowers are about an inch long; the cup is divided into ten narrow, long segments. The female flowers are green, and of the shape of a hollow cone, with its base upwards. The membrane covering the seeds breaks very soon in this species, so that the seeds are almost always visible.

It grows by damp walls, and sometimes about the stumps of trees in woods. It flowers in July and August. Dillenius describes it under the name of *Lichen domesticus minor*. Linnæus, by that of *Marchantia calyce communi decempartito laciniis linearibus*; and Micheli, under that of *Marchantia capitulo stellato radiis teretibus*.

2. *Marchantia foliis longioribus laciniatis.*
Long and jagged-leaved Marchantia.

The leaves of this species are often three or four inches long; they do not grow in imbricated tufts, as those of the former, but spread themselves irregularly about; they are from a third of an inch to an inch broad, and are deeply divided into segments. They are of a beautiful green colour, and have purple veins on their upper surface, and are reticulated; the spaces between the reticulations are of a figure, approaching to rhomboidal, and are not punctated, but plain; on the under part of the leaves there are lanuginous fibres, which fasten it down to the earth, stones, &c. but these do not reach quite to the extremities, so that the edges are loose. The pedicles on which the male flowers grow are two inches or more in length; the perianthium is divided into ten or twelve segments. The female flowers are of a funnel-like shape, small at the base, wide at the mouth, and dentated irregularly at the edges; every denticulation ends in a fine white hair. These contain a number of seeds, covered at first with a membrane, but which soon disappears. It grows in damp places by ditch-sides, and in wells. The male flowers appear in May and June, the female ones in September; but they remain on the plant, till the male flowers of the next year appear. The botanical writers in general have described this, under the name of *Lichen vulgaris*, and *Hepatica fontana*. Micheli calls it, *Marchantia major capsularum crenis in longiusculum pilum desinentibus*.

There are three other species of the *Marchantia* distinguished by authors: 1. A broad, roundish-leaved one. 2. A very narrow, undulated-leaved *Marchantia*; and, 3. The dichotomous *Marchantia*, with very broad, rounded segments.

Dillenius calls this and the two following genera by the common name *Lichen*; and Linnaeus calls both those, as well as this, *Marchantia*: we think we see sufficient reasons for separating them. Micheli and Dillenius do not at all agree about their microscopical observations on this genus: this is no place to enter into such a controversy; but there might, perhaps, be a way found of reconciling their different accounts, since there is no doubt of their being both ingenuous and candid writers. Much more than either of these authors have discovered, in regard to the other Mosses, as well as to these, may be made out by good glasses, but not enough perfectly to explain them by has hitherto appeared.

M O S S E S.

Class the Seventh. Genus the Second.

CONICEPHALA.

CONICEPHALA is a genus of Mosses, consisting of a foliaceous matter, furnished with fructifications, or male and female flowers, sometimes on the same plants, sometimes on different plants of the same species. The male flower is supported on a long pedicle: its calyx is a common perianthium, formed of five segments, which do not separate, but compose together a kind of head of a conic figure, sometimes more acute, sometimes more obtuse; this perianthium contains five flowers. The corolla is monopetalous, turbinate, and shorter than the cup: the stamen is single, undivided, and is longer than the flower: the anthera is tumid, and oval, and opens from the top into five segments; the farina is lodged on filaments.

The female flower is composed of a perianthium, consisting of one piece, green, and not raised from the surface of the leaves; it is rounded below and flattish, and covered with little granules at the top, and is divided within into several cells, containing seeds of an elliptic figure. There is no corolla, nor any other visible part of fructification.

1. *Conicephala*

1. *Conicephala longifolia capitulo acutiore.*
The long-leaved Conicephala, with a sharp-pointed head.

This is a considerably large species; its leaves are three inches, or more, in length, and from a third of an inch to half an inch in breadth; they creep on the ground, and are fixed to it by multitudes of fibrous roots. They are of a bright green colour, and of a fleshy structure; they are reticulated on the surface, and divided into a sort of rhomboidal figures, which are punctated in a beautiful manner.

The male flowers grow on pedicles of an inch and half in length; the perianthium forms a conic head, sharp-pointed, and moderately broad at the base.

The female flowers grow like warts, on various parts of the leaves; in other plants they are of about a seventh of an inch in diameter.

It grows in damp, shady places, in great abundance. Its male flowers appear in March, the female ones in June, or July, but they remain on the plants till that time the next year. Most of the botanical writers have called this Lichen pileatus, and Hepatica pileata. Micheli calls it, Hepatica vulgaris major; and Linnæus, Marchantia foliis dichotomis calyce communi quinquepartito. Dillenius describes it under the name of Lichen vulgaris major pileatus et verrucosus.

2. *Conicephala brevifolia capitulo obtusiore.*
Short-leaved Conicephala, with obtuse heads.

This is a much smaller species than the former. Its leaves seldom exceed an inch in length, and are not much divided, but sinuated round the edges; they are of a dark green colour, and have no veins visible on them: they are reticulated, as it were, or scaly, but not divided in a rhomboidal form; when abundant moisture makes the leaves branch out, it is usually in a dichotomous manner.

The pedicles which support the male flowers are about an inch in height, and of a brown colour; the perianthium forms a head of an obtusely conic figure; they are divided into five segments usually, but sometimes into four or six. The pedicle of these has no vagina at its base. The female flowers are small and warty; they are of a duskier green colour than the leaves, and rough on the surface. The male flowers appear in April, the female ones in July, or August.

It is not unfrequent with us on the damp banks of ditches. Dillenius describes this species under the name of Lichen pileatus parvus foliis crenatis. Linnæus calls it, Marchantia calyce communi, quinquifido, hemisphærico; and Micheli, Hepatica media capitulo hemisphærico.

3. *Conicephala angustifolia divaricata.*
Narrow-leaved, divaricated Conicephala.

This is an extremely singular species. The leaves are an inch or two in length, and about a sixth of an inch in breadth; of a deep green colour, and marked with a middle rib, very visible all the way: they are variously divaricated in a dichotomous manner, and are not crenated at the edges. The extremities of them are cordated, or have a depression or indenting in the middle, and from this indenting rises the stalk, which supports the male flowers. This is about an inch high, moderately thick, and of a brownish colour. The head, formed by the common perianthium, is somewhat obtuse, though less so than in the last species. The female flowers are large, oblong, thick, and rough at the top.

It is a very rare species with us. I once found it on the boards behind a water-mill in Buckinghamshire, and once near Mount-forrel in Leicestershire. Micheli has described it under the name of Hepatica minor angustifolia capitulo hemisphærico.

The female flowers, in this species, are sometimes on the same plants with the male, sometimes on different ones.

Micheli does not allow the elliptical bodies contained in the female flowers of the Conicephala, or hepatica, as he calls it, to be seeds. We do not certainly know, indeed, that what we call seeds in any of the plants of this class are truly so.

M O S S E S.

Class the Seventh. Genus the Third.

S E L E N I A.

SELENIA is a genus of Mosses, consisting of a foliaceous matter, and exhibiting male and female organs of fructification on different parts of the same plant.

The male flowers stand on long pedicles, which grow from vaginæ on the leaves of the plant. The cup is a common perianthium, consisting of four segments, disposed in a cruciform manner, when ripe, and containing four flowers. The stamen is a single filament, undivided and longer than the corolla, which is monopetalous, turbinate, and shorter than the cup. The anthera, on the head of the stamen, opens into four segments, and discharges a farina affixed to fine filaments.

The female flower is composed of a perianthium without a corolla; this is monopetalous, and undivided, and is affixed to the leaves in form of a crescent; in the hollow of this there are lodged a number of green, roundish, flattened seeds.

Dillenius blends this genus with the two former, under the common name Lichen, as does also Linnæus, under that of Marchantia. Micheli separates them, and calls this Lunularia, a word too nearly like the Lunaria, a name of a different plant in found. There is only one known species of this genus.

S E L E N I A.

This is a small, but very beautiful plant. It generally grows in considerable quantities together, and its leaves lie in an imbricated manner over one another. They are from half an inch to an inch in length, and near half an inch in breadth; sometimes simple, sometimes divided into three or four lobes. They are moderately thick, not pellucid, and of a tolerably bright green colour. There are no veins discernible in them, but they look, as it were, squamose; on the under side there are fine lanuginous roots, of a whitish colour, disposed in a row along the middle of every leaf: and sometimes in ramifications from that; from the middle of the leaves arise the pedicles that support the male flowers; they are about three quarters of an inch in length, and moderately thick. The segments of the perianthium are hollow. The female flowers or lunules are found on different parts of the plant, and that in great number, each containing a large quantity of seeds.

This plant is frequent about London on old walls, and in other damp places. It flowers in July and August. Dillenius has described it under the name of Lichen feminifer, lunatus, florifer, pileatus, tandem cruciatus. Micheli, under that of Lunularia vulgaris. Linnæus, under that of Marchantia calyce communi quadripartito laciniis tubulosis. Other of the botanical writers have called it, Lichen feminifer parvus, and Lichen petraeus acaulos.

M O S S E S.

Class the Seventh. Genus the Fourth.

J U N G E R M A N N I A.

JUNGERMANNIA is a genus of Mosses, consisting usually of stalks furnished with leaves, disposed in a pennated or squamose manner; sometimes of leaves only; and producing visible male and female parts of fructification.

The male flower stands on a long strait pedicle, which arises out of a vagina, growing from the upper part of the surface; it has neither calyx, nor corolla, but consists only of an anthera, which is at first of an oval figure, but afterwards opens into four segments, and remains in this state a long while on the plant.

The

The female flower has no pedicle, but stands sometimes on the same plant, sometimes on another of the same species; on the extremities of the branches of the plant, or on other parts of it. There is no calyx or corolla visible, but all that is seen is a number of seeds lying naked in a cluster, sometimes only a single one.

Dillenius has given this genus of Mosses the name of *Lichenastrum*. Linnæus and Micheli call it, *Jungermannia*; but the latter has described and figured some of it's species, under the name of *Muscoides*, and others under that of *Marfilea*.

1. *Jungermannia pennata vagina dentata.*

Pennated Jungermannia, with a dentated vagina.

This is a very elegant little plant. It grows to two or three inches in length; it's branches are sometimes simple, sometimes divaricated; they are beset on each side with a row of fine, pellucid, bright green leaves, broad and obtusely pointed. The branches, thus pennated, somewhat resemble those of the *trichomanes*. The pedicles which produce the male flowers are about an inch long; they arise out of oblong vaginæ, dentated at the edge, and placed sometimes in the middle, sometimes near the base of the plant. The anthera is round at first, but divides into four parts. The seeds are numerous, and very small, and are dispersed over several parts of the plant, but principally about the ends of the branches.

It is found in our woods among the other Mosses, about the stumps of old trees; it flowers in April and May. Dillenius calls it, *Lichenastrum trichomanis folio e basi et medio florens*.

2. *Jungermannia divaricata pediculis brevibus.*

Divaricated Jungermannia, with short pedicles.

This is a very singular plant. It grows to two or three inches in length, and often spreads to near as much in breadth. It grows from it's base with a single stalk, of the thickness of a small twine, but not round; this sends off a number of branches, and those afford yet others, and towards the extremity the main stalk itself divides into several portions, all branched. The stalks are all covered with hollow leaves, in a double series, the upper larger than the under, and of a somewhat triangular figure; they are green at first, but afterwards become of a purplish brown. The whole plant hangs loose from the thing it grows on, and, at the extremities of it's several ramifications, produces oblong vaginæ of a square figure, and divided at the top into four segments; from these arise short pedicles, scarce a fifth of an inch long, beyond the vagina, and on the heads of these stand the antheræ, one on each; they are tumid and roundish, and finally burst into four segments: the seeds lie in clusters at the extremities of the branches.

It grows on rocks, and on the trunks of old trees in our woods: it is plentiful enough about London. Dillenius has described it under the name of *Lichenastrum imbricatum tamarisci Narbonensis facie*. Linnæus calls it, *Jungermannia foliis imbricatis serie duplici, superioribus, subrotundis, majoribus, convexis, obtusis, majoribus*.

3. *Jungermania foliosa pediculis longissimis.*

The leafy Jungermannia, with very long pedicles.

This species differs extreamly from the two former, in that it is not composed of branches furnished with leaves, but of leaves only, and much resembles the *selenia* in figure. It generally grows single. It's leaf is about an inch long, and half an inch or less broad, sinuated at the edge, and usually divided into two or three lobes. It is of a bright green colour, and is affixed to the ground by a series of roots running all along it's under part; when not in a flowering state, it would never be suspected for a *Jungermannia*: from the middle of the leaf arises a short dentated vagina, and from this a very long pedicle, on the summit of which appears the anthera, roundish at first, but afterwards dividing into four segments.

It is not uncommon about the banks of rivers, and in other moist places. It flowers in March and April. Dillenius has described it under the name of *Lichenastrum capitulis rotundis è foliorum medio enascentibus*; and Micheli, under that of *Marfilea major, atrovirens, floribus albicantibus è foliorum medio enatis*.

4. *Jungermannia foliosa divaricata vagina globosa.*
Divaricated, foliose Jungermannia, with a globose vagina.

This is a very small, but a very beautiful species. It consists of a single leaf of about an inch long, and a third of an inch broad, and so divaricated, that it extends often as far in it's whole diameter, as in it's length. It is of a beautiful pale green colour, very thin, and somewhat pellucid; it's several segments are not sinuated at the edges, and they terminate in obtuse points. They have a rib running all along the segments, and sometimes they grow in clusters, though more usually singly; on the lower part of the middle ribs of these leaves there stand vaginæ, of a very peculiar structure; they are globose, hairy, and succulent; from these there grow pedicles of about an inch long, which sustain each it's anthera, which is small, roundish, and of a brownish-red colour, and soon after it's appearance divides into four segments. The seeds, both in this and the former species, are very small, and are placed in clusters toward the edges of the leaves.

This grows about the stumps of old trees in Hornsey-wood, and some other places about London. It flowers in April. Dillenius has described it under the name of *Lichenastrum tenuifolium furcatum thecis globosis pilosis*. Vaillant calls it, *Hepatica arborea globuligera*; and Micheli, *Marfilea minima, angustifolia, floribus ex inferiori foliorum parte e subhirsuta et turbinata vagina erumpentibus*.

It is to be observed, that Micheli makes all the much-branched *Jungermannia* *Muscoides*, and all the foliose ones *Marfileæ*. The more singular species of *Jungermannia*, beside those described here, are, 1. The purple, hollow-leaved *Jungermannia*. 2. The scorpion-tail'd kind, with fimbriated leaves. 3. The fine, fern-like kind. 4. The rounder-leaved, arbor vitæ-like kind. 5. The woolly, fern-like *Jungermannia*. 6. The round-stalked, purple *Jungermannia*. 7. The jagged *Jungermannia*, with long vaginæ. 8. The multifid, foliose *Jungermannia*. 9. The little areolar *Jungermannia*.

M O S S E S.

Class the Seventh. Genus the Fifth.

ANTHOCEROS.

ANTHOCEROS is a genus of Mosses, consisting of a foliaceous matter, extended on the ground, and producing male and female fructifications; the former very evident.

The male flower rises immediately from the plant, without a pedicle: it consists of a monophyllous calyx, of a cylindric figure, with an undivided edge; there is no corolla, nor even stamen, but a single anthera of a very singular form arises. From the base of every cup, this is very long, slender, tubulated, and composed of two valves, between which is a capillary filament, covered with farina.

The female flower is sometimes on the same, sometimes on a different plant. It grows to the leaf without any pedicle, and is monophyllous, and divided into six segments, and contains three seeds lodged in it's bottom.

There is not, however, an absolute certainty, as to the number of the seeds, or of the segments of the cup: sometimes there are only two seeds, sometimes only one, and the number of segments is in proportion.

1. *Anthoceros foliis magis laciniatis.*

The more jagged-leaved Anthoceros.

This species appears, first, in form of a cluster of small green leaves, growing together in a circular, or nearly circular, form, and of the diameter of half an inch, or an inch; the leaves are separately of an irregularly oblong figure, rounded at the ends, and sinuated both there and at the sides: they are very thin, of a glossy surface, and somewhat pellucid. From several parts of the surfaces of these leaves, there

there rise vaginae of an oblong figure, and out of these there grow certain oblong bodies, one from each; these are at first as fine as hairs, but they afterwards grow thicker, and to two or three inches in length; these, when ripe, split from the top half-way down, and appear to be antheræ, loaded with a yellow farina. Sometimes on the same plant, and sometimes on others which do not produce these antheræ, there appear in several parts of the leaves little prominences like warts, which, when ripe, open into six parts, and shew that they are the female flowers, containing each three seeds. This fructification is very small, and it requires a microscope to distinguish it well; when thus examined, six is the usual number of the segments, and three of the seeds, but it is not certain. It flowers in April. It is found in damp places, and by way-sides, in many parts of England. I have met with it about Mendip-hills in great abundance. The flowers appear in April, and are ripe in June. It has been described by Merret, under the name of *Lichen capillaceus ex plurimis capillamentis nigricantibus constans*, a strangely wild and imperfect name. In the third edition of Ray's Synopsis it is called, *Lichenastrum gramineo pediculo et capitulo oblongo bifurco*. Micheli calls it, *Anthoceros minor foliis magis crenatis subtus incurvatis*; and Dillenius, *Anthoceros foliis minoribus magis laciniatis*.

2. *Anthoceros foliis minus laciniatis*.

The less jagged-leaved Anthoceros.

This species makes it's first appearance with two, three, or four leaves together, which do not form a tuft, as those of the other, but scatter several ways; they are near an inch long, about a third of an inch broad, and slightly sinuated about the edges; they are very thin and transparent, and of a bright green colour. From the several parts of these leaves arise vaginae, small at the leaf, and somewhat undulated about the rim; from these there grow antheræ of an inch and half in length, which burst open, when ripe, and shed a greenish-yellow farina. On other plants of the same species, never on the same individual, so far as I could observe, there grow small protuberances like warts, which open into an uncertain number of segments, and contain one, two, or three seeds.

I found this species abundantly at the foot of an old wall, by the road to Shepton Mallet in Somersetshire. It flowers in May and June.

Micheli describes it under the name of *Anthoceros major*; and Buxbaum, under that of *Lichen hepaticus pediculis gramineis*.

There are three other species referred to this genus by authors. 1. The narrow-leaved *Anthoceros*, with a short flower. 2. The *Anthoceros*, with a finely divided leaf; and, 3. The thick-headed, short *Anthoceros*. None of these have been found in England.

M O S S E S.

Class the Seventh. Genus the Sixth.

RICCIA.

RICCIA is a genus of Mosses, consisting of a foliaceous matter, procumbent on the ground, on which there are evident male and female fructifications, sometimes both on the same, sometimes on different plants of the same species.

The male flower has neither calyx nor corolla, but consists of a single anthera, of an oblong, tubulated form, which grows to the leaves without any pedicle, and opens from the point, to discharge a fine greenish farina.

The female flower has no corolla, and scarce any calyx; it consists principally of a pericarpium of a globular figure, in which there are contained a number of seeds. The male flowers in this genus grow in some species from the middle rib of the leaf, in others on other parts of the superficies, but usually in a double row. The female flowers in some are placed in the chinks, and stellated scrobiculæ on the leaves, and rise above the surface; in others they are contained within the very substance of the leaves, and are not visible till the outer membrane of them is decayed. The pericarpium

pium does not naturally burst open in any of them, but the rain dissolves the texture of it, and the seeds are then discharged.

1. *Riccia latifolia fructu aspero.*

Broad-leaved Riccia, with a rough fruit.

This is a very beautiful little plant, and has much the appearance of some of the mar-
chantias. It consists of a single leaf, which generally sends out four, five, or six di-
varications from the same base: these extend themselves in a circular form, and are
fixed down to the ground by roots, sent all along from the middle rib; they are each
about an inch long, and, in the broadest part, about a third of an inch in breadth.
They are narrowest near the base, and, at about half their length, they divide into
two ramifications, which usually subdivide again, or, at least, are dented at the end
in a sort of fissure, and are of a pale green, and of a kind of tessellated appearance;
at the middle rib there stand two rows of short, green, erect antheræ, and, in other
parts of the leaves of the same plant, are placed the fruit, which are roundish in figure,
and somewhat rough on the surface, and very small, but prominent, above the surface
of the leaves.

It is a very scarce plant; I have only found it once, which was in a damp lane near
Soilton in Lincolnshire: it was in flower in the end of April. It is very remarkable of
this plant, that it has a somewhat aromatic taste, like coriander seeds. Doody has
mentioned it, in Ray's Synopsis, under the name of Lichen verrucosus; but no other
author has given us any account of it, except this and Micheli, who calls it Riccia
major, coriandri sapore, foliorum superficie velut tessellata, fructu aspero.

2. *Riccia obtusifolia pinguis.*

Flat, blunt-leaved Riccia.

This is a much smaller plant than the former; it never extends to more than three
quarters of an inch in its full diameter. It grows in a kind of irregularly circular figure,
divaricating from the same base into five or six parts, which are short, and broadest
at the extremity, where they are a little sinuated. They are of a dead green colour,
thick and fatty to the touch, and moist on the surface. From the middle of each di-
varication, or leaf, there grows a double row of antheræ, or male flowers: they are
short, and obtuse at the point, and in the very substance of other plants of the same
species, never of the same, so far as I could observe, there grow roundish and smooth
capsules, containing a vast quantity of minute seeds. It grows in damp places in woods,
and under hedges, and flowers in February. Micheli calls it, Riccia minor, latifolia,
pinguis, aspergine crystallina perfusa.

3. *Riccia foliis laciniatis.*

Jagged-leaved Riccia.

This little plant seldom exceeds a third of an inch in diameter, though it grows in
a kind of circular form. It expands from the same base into four or five divarications,
which are all of them ramified into five or six parts, somewhat in the manner of a
stag's-horn; the extremities are sharp-pointed. The leaves are of a deep green
colour, glossy on the surface, and somewhat succulent. From their middle there rises
a double row of antheræ, which are very short, of a browner colour than the leaves,
and blunt at the ends: they split after a certain time. The female flowers seem of
the nature of those which are buried within the substance of the leaves: on pressing
the plant gently between the fingers, there are felt little granules, harder than the rest,
which are probably the fruit, but a microscope makes them out but very imperfectly.

The plant is frequent on Hampstead-heath, on Blackheath, and about Putney, but
it is so small that it must be carefully looked after. It flowers in April. Dillenius has
described it under the name of Lichen omnium minimus foliolis scissis super terram
expansis. Micheli calls it, Riccia minima, nitida, segmentis angustis acutis.

The other species of Riccia are, 1. A large Riccia, with smooth, pyramidal fruit.
2. The blue-green, deep-cut Riccia. 3. The lacinated Riccia, with hairy edges.
4. The narrow-leaved, greyish, thick Riccia. 5. The small Riccia, with blunt seg-
ments.

M O S S E S.

Class the Seventh Genus the Seventh.

TARGIONIA.

TARGIONIA is a genus of Mosses, consisting of foliaceous matter, and producing distinct male and female flowers on the same plants. The male flower has no corolla; the calyx is monophylolus, and divided into two parts, resembling two valves, convex on the outside, and concave within, and adhering to the plant without a pedicle. In this is placed on a short stamen a single anthera, of a tumid, roundish figure, dentated at the top, and filled with a yellowish farina, adhering to fine filaments. The female flower has neither calyx nor corolla visible, but is a roundish, tumid pericarpium, containing a number of cells, and in each of these an oval seed. These grow on the sides of the leaves, the male flowers on the tops. There is only one species of this genus known: this is the

*Targionia foliis oblongis.**The oblong-leaved Targionia.*

This is a very small, as well as a very singular, plant. It consists of a single leaf, which is of an oblong figure, narrow at the base, and growing gradually broader to the extremity, where it is indented in form of a heart. The whole leaf is scarce half an inch long. It has a multitude of little fibres near the base, which serve it as roots; its upper end is loose. The whole leaf is of a dusky green colour, and not pellucid, but it is dotted all over, as it were, with white; when fully grown, it often becomes throughout of a purplish colour. At the extremity of the leaf, in the very indenting just mentioned, there grows a bivalve calyx, of considerable size in proportion to the plant, in which is the single anthera, on its short stamen, full of the farina. On the sides of the leaves, and on their lower part, there grow certain wart-like bodies, roundish, tumid, and somewhat rough on the surface. These are the pericarpia, containing the seeds of the plant, in several distinct cells, but so small, that it requires a good microscope to distinguish them.

It is not a native of England. Micheli says it is common in Italy. I have received fine specimens of it from Bagneres in France, from which I have made out the characters, especially of the female fructification: if I had had the recent plant, perhaps, they had been more perfect.

Dillenius calls this, from C. Bauhine, Lichen petraeus minimus fructu orobi. Columna, who first discovered it, calls it, Lichen acaulos hypophyllocarpus. Buxbaum calls it, Lichen terrestris minor feminifer; and Micheli, Targionia minima vulgaris. The several authors, who have described this plant, have had very different opinions, as to its fructifications. Micheli will not allow the protuberances on the sides of the plant to be the fruit, but he has allowed bodies of the very same figure and structure to be fruits in other cases.

M O S S E S.

Class the Seventh. Genus the Eighth.

SPHÆROCARPUS.

SPHÆROCARPUS is a genus of Mosses, consisting of foliaceous matter, expanded on the ground, and producing very large and obvious fructifications.

It is probable that the male flowers are produced on separate plants from the female, and have not been discovered to belong to the same species; no male parts of fructification are described to us, and the plant is not at hand for our examination. The female parts consist of a tubulated and inflated vagina, within which is contained a large globular capsule, containing a great number of small, loose seeds.

K k

There

There is only one species of this genus known.

Sphærocarpus.

The first appearance this plant makes is in form of a foliaceous crust, of an indeterminate figure, which extends itself to an inch, or more, in diameter, and is variously undulated at the edges; this is of a dusky colour, but of a tolerably smooth surface, and is fixed down to the ground by a multitude of fibrous roots. On its surface there appear, in clusters, a kind of inflated vaginæ; they are about a sixth of an inch in length, and are narrow at the base, wide near the upper part, but again contracted into a narrow mouth: these do not naturally open, but rot away, and so let loose the fruit to rot in its turn, and let out the seed; but, if cut open, there is found, near their base, a round body, considerably large in proportion to the plant, which, when opened, is found full of smooth granules.

Dillenius quarrels with Micheli for taking these for seeds, and rather supposes them to be globules of farina, and the globule containing them an anthera; but he is certainly wrong in this; the farina of all these plants is affixed to filaments, these globules are perfectly loose.

The plant is not of English growth, but is frequent in Italy, in garden-walks, and in damp places. It flowers in April.

These are the genera and more singular species of Mosses known. If we have omitted the naming some which make a figure in the works of authors, it has been owing to our having discovered them, however pompously figured, not to be distinct species, but mere varieties of other species, named as such in their places.

We should not pass over in silence our having omitted one of Linnæus's genera of Mosses, the blasia; that author took the account of the genus from Micheli, who had but imperfectly examined what he declares to be the only species of it; and Dillenius has, by a very accurate enquiry into its nature and characters, justly determined it to be a species of mnium; as such, it is mentioned in our list of the species of that genus, affixed to our description.

