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A general natural history

A history of plants

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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 I.

O F S U B M A R I N E P L A N T S.

THE fresh waters produce a great number of plants, many of which are in all respects like those of the land, and have perfect and obvious fructifications, tho' no part of them ever reach the surface; but it is otherwise with the Submarine ones. They are wholly unlike other plants in their form, texture, and manner of growth, and have either no visible fructifications at all, or such as are very difficultly understood, as to their structure, and method of fecundation.

Their manner of growth also is wholly different from that of other plants.

Plants in general have been defined to be organised bodies, nourished by means of roots which penetrate into the earth; but the Submarines have no such roots, they adhere to the bodies, which support them by broad bases, which do not penetrate into the substance they are affixed to, nor is that generally a matter capable of affording nourishment, if they did: a piece of stone, or even a glass bottle, or any other thing, sunk in the sea serving for this purpose. The part by which they are fixed, evidently answers no other purpose beside that of fixing them; and the plants themselves seem to be all over root, or to take in nourishment from the circumambient water, by pores placed all over their surfaces.

In plants in which the parts of fructification can give us no characters for distinguishing the orders and genera, we must have recourse to other differences: of these the most obvious are the most eligible.

The texture of the Submarine plants is of three very different kinds, and, according to this, we shall therefore arrange them under three classes.

Submarines; Class the First. Those which are of a stony hardness, and not flexible.

Submarines; Class the Second. Those which are of a very firm and tough texture.

Submarines; Class the Third. Those which are of a tender and herbaceous structure.

S U B M A R I N E S.

Class the First. Genus the First.

MYCEDIUM.

MYCEDIUM is a genus of Submarines of a hard and stony substance, not branched, regularly cavernose and lamellated; formed of gyri, or ridges very hard, and solid, surrounding the surface, or running over it in various windings and meanders, and leaving oblong, winding or undulated, cavities between them, which cavities are filled up with a matter of the same kind, formed into very thin plates or lamellæ of various structure.

No part of fructification has ever been discovered in any species of this genus.

These plants, from their resemblance to the Fungi in their structure and lamellæ, have been called by authors in general Fungi marini; to prevent confusion from similar sounds we have called them Mycedia, from the Greek μυκή, fungus.

1. *Mycedium convexum gyris sulcatis.*

The convex Mycedium with sulcated gyri.

Brainstone.

This is one of the largest of this genus. It is affixed to a rock, or other solid body, by a considerably broad base; from this it extends itself into an irregularly convex figure, sometimes globular, sometimes gibbose, and sometimes more flat. It grows very frequently to ten inches or a foot in diameter; sometimes to two feet or more. It is composed of a multitude of gyri or ridges, running in undulated figures, and divaricating into a multitude of others, which in many places grow to one another again. These ridges are of a very solid matter, and of a white colour; they are broader than a large packthread, and are sulcated or marked with a depression all the way along their middle. The interstices between these gyri are furnished with lamellæ, or thin plates of the same hard matter, disposed in a double row in each interstice. These leave a multitude of small unequal cavities between them. The great irregularity of the disposition of the gyri renders these interstices of various figures; they are usually oblong, but sometimes a few round ones are formed here and there: these form perfect resemblances of the Astroites or starry coral. The interstices between the gyri are large. This species is extremely common on the shores of America, and on those of the East Indies; we know it in England under the name of the Brainstone, a name given it from its resembling in some degree the appearance of the brain. Boerhaave calls it *Fungus maritimus coralloides undulatus*; and Ray, *Lapis fungites cerebriformis*.

2. *Mycedium convexum gyris integris.*

The convex Mycedium with undivided gyri.

This is a less common, but a much more beautiful species than the former. It grows from a large base affixed to a rock, to a very considerable size: a foot in diameter is not uncommon with it. It is sometimes highly convex on the surface, but it more usually rises less, and that in an irregular manner, some parts of its surface being much higher than others. It is all over undulated with gyri, which run in a beautiful irregularity over it, and join and divaricate again so frequently, that the configuration is strangely confused. These gyri are very slender, and the interstices, from their great number in the mass, are very small between them. The gyri are not sulcated as in the former species, but rise up in ridges, when perfect, though they are generally worn down to a flatness by the motion of the water. The lamellæ between these are very fine, and arranged in a double row, forming very small cavities between them. This grows on the shores of Barbadoes, and in many other parts of the West Indies. It is sometimes met with in the shops with us, confounded with the other under the common name of Brainstone. Bessler describes it under the name of *Massa coralloides maris fluctuationem representans*.

3. *Mycedium*

3. *Mycedium cavatum undulatum.*
The Hollowed undulated *Mycedium*.

This is a very elegant body. It's general structure is the same with that of the convex kinds, but it differs extremely from them in figure. It grows to the rocks by a small base, not thicker than a wheat-straw; from this it expands itself every way, till at an inch height it is often two inches in diameter, and from this it expands to three, four, or more inches. From the base to within half an inch of the top, it is usually smooth; from this part to the edge it is striated; and it's top is very beautifully undulated. It's circumference is a deeply sinuated line, and the two sides come every-where so near one another, as to leave but about half an inch for the lamellæ. The margin terminates every-where in a thin edge. The lamellæ fill up the intermediate space in a double series, joined as in the others by an opaque white line of a spongy texture in the middle; the lamellæ are very finely serrated, and, as they do not stand very close to one another, they make a beautiful appearance. The whole plant is white as snow, and of the hardness of marble. It grows on the shores of the Baltic in great abundance, and is found also on those of the East and West Indies. Besler describes it under the name of *Fungus faxeus minor*, and Sir Hans Sloane under that of *Fungus lapideus minor undulatus*.

4. *Mycedium obverse conicum.*
The inverted conic *Mycedium*.

This is a much more simple species than any of the former in its external appearance, but it is more beautiful than most in it's internal structure. It grows to an inch or two in height, and to the thickness of a man's thumb; sometimes much larger, but this is its usual standard. It is affixed to the rocks by a small and slender base; from this it gradually enlarges, and grows into the form of an inverted cone, the top being wider than any other part. The external surface is irregularly striated, the limb or verge beautifully undulated, and the whole cavity is filled up with thin, but long and broad lamellæ, rising from all parts of the internal surface, and meeting in or near the center; these do not stand very close, but leave deep, simple hollows between them. The whole is sometimes of a pure, fine white, sometimes of a brownish white colour, and is of a hard and stony texture. This is the usual appearance of this plant, but it is subject to great variations; sometimes it grows to a much greater length, with little more thickness; sometimes it is shorter and broader, and sometimes several plants of it grow one out of another, in the manner of the cups in the proliferous cup mosses; in this last state, it makes a very elegant figure.

It is found, in all its variety of appearances, about the coasts of the East Indies, and not unfrequently on those of America. Besler has described this under the name of *Fungus coralloides pezizæ forma*; others called it *Fungus faxeus vulgaris*.

5. *Mycedium patulum cancellatum.*
Open cancellated *Mycedium*.

This is a yet more elegant plant than the conic *Mycedium*; it rises like it from a small base, and gradually expands to a considerably wide mouth. It's usual height is an inch an half, it's breadth about an inch. It's external surface is striated pretty deeply, and is lightly marked with transverse lines. It's edge is undulated, and the expansion is sometimes roundish, sometimes oblong, and often perfectly irregular. It's whole cavity is filled up with long and fine lamellæ, which form cavities between them, which are again intercepted by regular transverse flakes, of the same substance with the lamellæ themselves, and equally thin. This is a very beautiful plant in this it's common state; but nature frequently luxuriates and forms oblong bodies, composed of several of these placed on one another. It's colour is white, and its texture stony. It is found about the shores of Italy, on those of some of the islands of the Archipelago, and in many other places. Some of the old botanical writers have left us imperfect descriptions of this, under the name of the *Alcyonium quintum Dioscoridis*.

6. *Mycedium*

6. *Mycedium planum lamellis longissimis.*
The flat Mycedium with very long lamellæ.

This is also an extremely beautiful species, and perfectly different from all the rest. It grows to the rocks by a broad base, which is often placed at one edge, not in the center, as in the other Mycedia; from this it expands into various long and broad plates, of different thicknesses, and very irregular figures. The under surface of these is often protuberant in some places, and hollowed in others, and is irregularly furrowed with longitudinal lines running from the base toward the edge; its upper surface has a number of irregular gyri, broad, solid, and white, sometimes plain, sometimes punctated on their surface; and between these there run very long and considerably thick lamellæ.

This often grows to a foot or more in length, and near as much in breadth. Imperatus has described it under the name of *Fungus petrosus*, and Boerhaave under that of *Fungus coralloides agarici forma*. It is frequent about the American islands.

After these general descriptions of the more singular species of the Mycedium, the others will easily be known by their names: They are, 1. A yellowish-white Brainstone Mycedium, with thin gyri. 2. A large kind, with blackish gyri, and white lamellæ. 3. The Brainstone Mycedium, with its cavities divided by transverse septa. 4. The Brainstone Mycedium, with extremely thin lamellæ. 5. The Brainstone Mycedium, with large cavities. 6. The Cup Mycedium, with lamellated pores. 7. The Cup Mycedium, with undulated laminae. 8. The funnel-shaped Cup Mycedium. 9. The high-ridged, flat Mycedium.

These are the different species hitherto known, beside those already described: descriptions of these would be tedious, and are unnecessary, as the general structure is the same in all, and their specific names are sufficient to express their differences. The variety of the Mycedia is indeed almost infinite; and people who do not examine their real characters, but judge of them by their form, might extend the number of supposed species to more than a thousand. Where we know nature sports in variation so much, we are to be upon our guard against taking varieties for species. All the Mycedia I have seen may be justly referred to one or other of these kinds.

All these Mycedia, and many of the Asterææ of the following genus, are taken up by the people of the West Indies for burning into lime. They make a very good sort, but less durable than that burnt from hard stone.

SUBMARINES.

Class the First. Genus the Second.

ASTERÆA.

ASTERÆA is a genus of Submarines, consisting of a stony matter, formed into simple or unbranched masses, regularly cavernose and lamellated, made up of solid gyri, or ridges, running into round, or nearly round configurations, and forming cavities of the same shape, which have lamellæ propagated from their sides, and converging to a point in the center, and by that means produce in each cavity the figure of a radiated star.

No part of fructification has ever been discovered in any of the species of this genus; but the botanic writers have, from the figure of a star in the cavities, given it the name of *Fungus Astroites*, or, simply, *Astroites*: the same word *Astroites* being used somewhat more properly for this body in its fossil state, we have, to avoid confusion, called it in its native state *Asteræa*.

1. *Asteræa stellis majoribus ovatis.*
The large, oval starred Asteræa.

This is one of the least beautiful species of this genus; it is of a coarse structure, and dusky white colour; it rises from a broad base, and expands into a large thick mass, of an irregularly convex figure. Its general size is that of a man's head, but is often twice or thrice as large. Its surface is formed of gyri, arranged into irregularly oval figures, with

with no spaces between them, and the cavities of them furnished with short lamellæ meeting in the center; the matter of the gyri is coarse, and they are considerably thick, and somewhat rounded on their surfaces. They are often worn down by the motion of the sea, and are then found to be cavernous in their structure. The lamellæ are moderately thick, and are not placed very near one another.

This species is frequent about the shores of the East Indies, and in many other places. Beller has described it under the name of *Fungus lapideus porosus*; and Boerhaave calls it *Fungus coralloides astroites*.

2. *Asteræa stellis majoribus, rotundioribus.*

The Asteræa, with large, round stars.

This is a very beautiful species. It grows to a considerable size, a foot in diameter, or more than that; and is of a beautiful white colour, and great hardness. It adheres to the rocks by a broad base, and from thence it extends itself in a circular manner, rising into the form of a segment of a sphere. Its whole surface, in sight from above, is starry; it is formed of gyri, considerably thick, solid, and of the colour and appearance of white marble. These run into very regular circles, and form a beautiful appearance. Nature is not so perfectly regular in the structure of this body, but that some of the circles blend with, or injure one another, and by that means produce irregular figures; but the greater part are very perfectly round; and, as circles are figures which can only touch in small parts, there are spaces of various figures interspersed every-where between the circles, by which this species is, at sight, distinguished from the former. These spaces are filled up with lamellæ, produced from the external surfaces of the gyri; and the cavities within the gyri are regularly and beautifully stellated, lamellæ from all parts of the internal surface running to meet in the center. These lamellæ are moderately thick, and stand at a considerable distance from one another. There frequently are not more than ten, sometimes only five or six of them in each cavity, with the rudiments of some imperfect ones between.

This beautiful species is found about the shores of Jamaica.

The distinctions between these *Asterææ* have been so little attended to by authors, that we cannot fix any certain synonymon for this species: it is probably one of the *Fungi coralloidis astroitidis variæ* species of Boerhaave; but he has not been at the pains to distinguish them.

3. *Asteræa stellis minoribus rotundis.*

The small, round-starred Asteræa.

This is an extremely elegant species, and is less common, as well as more beautiful, than either of the former. From a roundish flat base it expands itself into a very convex, but irregularly-figured mass, sometimes roundish, oftener oblong. It is very white, and of a very firm texture: its usual size is that of a man's fist; but it sometimes grows considerably larger. Its surface is formed of gyri, smooth, solid, and considerably thick, which form themselves into roundish figures, sometimes perfect, but oftener injured by one another. The spaces between these are as beautifully lamellated as the cavities they form: the cavities themselves are very small, and are filled with numerous and very thin lamellæ, placed so close, that there are often between twenty and thirty in a cell. They are of a less bright white than the gyri, but they make a very beautiful figure, resembling most of all the species, a radiated star.

This is found about the shores of Antegoa, and in some other parts of America.

4. *Asteræa stellis magnis angulatis.*

The great angular-starred Asteræa.

This is one of the largest species of this genus: 'tis of an extremely solid and firm texture, and of a yellowish-white colour; though the yellowness easily wears off, on its being exposed to the air. It grows to the rocks by a firm base, which conforms itself to the shape of the part of the rock it grows to; and from this it extends itself to eighteen or more inches in breadth: its masses are usually rounded, and somewhat convex, but more flattened than those of any of the others. Its surface is composed of gyri, which are very thick, and somewhat rounded on their surface: these touch in all points, so that

there are no spaces between; and they form, by this means, irregularly pentangular or hexangular figures. These are large, and their cavities filled up with very numerous, thin, and beautiful lamellæ: there are often sixty, or more of these in a cavity.

This species is found in the Mediterranean, growing often deep under water, on the rocks near the shore.

5. *Asteræa gyris crassissimis planis.*

The thick and flat partitioned Asteræa.

This is by much the most singular of all the species of *Asteræa*; in all the others the stars make up the greatest part of the surface, whence we have named them from those, as the most obvious marks of distinction; in this, the gyri take up the far greater part, whence we name it from them. This grows from an extremely large and broad base, which seems indeed a kind of core to it; the matter of the surface often making only a shelly covering over it. It is usually met with of the bigness of a hen's egg, or thereabout, but it sometimes grows much larger. Its figure is rounded, and very convex. The gyri are extremely hard, and as white and solid as ivory near the surface; within they are full of holes. They do not rise into rounded surfaces, as in many of the other species, but are flat, and, in general, of the breadth of a large straw; in some places, where they coalesce, they are much more: they are dispersed over the surface in irregular and strange forms; but they every-where make cavities, which are small, and of a roundish, or irregularly-oval figure; these are radiated with lamellæ, in the same manner as those of the rest. They are thin, small, and not placed very near one another; and it is singular in this species, that the stars are deep sunk in from the surface, so that the gyri only, at a little distance, are seen; and these give the whole much of the appearance of that kind of mushroom which we call the Morel.

This is less frequent than the others, and is oftener found in the East Indies than any where else. Boerhaave, from its external resemblance to the boletus, or morel, calls it *Fungus marinus lapideus boletum Tournefortianum* referens: he adds, *Colore cinereo*. But the true colour of the species is pure white.

These are all the distinct species of the *Asteræa* yet known; the varieties of them are almost innumerable, but all may be referred to one or other of these.

S U B M A R I N E S.

Class the First. Genus the Third.

M A D R E P O R A.

MADREPORA is a genus of Submarines, of a stony hardness, but somewhat approaching to the ordinary figure of vegetables in its form. It is composed of a main stem, divided and subdivided into a number of branches, which are full of pores, or holes, running from the circumference to the center of the branch, and furnished with lamellæ, disposed in a stellar or radiated manner.

The surface in some of the species is smooth, and the pores larger, and at greater distances. In others it is striated, and the pores are smaller and closer. The striæ in these species are formed of a kind of lamellæ, growing from the surface of the tubules which form the pores. These always stand out beyond the rest of the surface, and their cavity is frequently intercepted by little transverse lamellæ within, which divide it into cells, in the manner of the cavities in the nautili and cornua Ammonis. Many of the *Madrepore* approach to the nature of coral in their texture: others of them are less hard.

1. *Madrepora glabra poris magnis.*

The smooth Madrepore with large pores.

This is the plant generally known under the name of White Coral. It is a very beautiful species of *Madrepore*. It grows to eighteen or twenty inches in height, and frequently extends its ramifications so wide every way, as to be in the whole nearly as much in diameter. It grows up with a single stem, of the thickness of a man's thumb,

or

or more: this is not strait, but tortuous, and full of prominent tubules, open at their tops, and forming pores; this main stem soon sends off a number of branches, which again ramify into several more, extending themselves every way, and sending out, at different spaces, other short branches, which seem, indeed, no more than long tubules, or conduits of pores. Beside these, the whole plant has its surface spangled over with pores, at small distances, a quarter of an inch, or more, being left solid between them, sometimes considerably more. The pores in the larger branches are such, as will admit a tare; in the smaller branches they are less, but in all considerably large. They stand out a little way from the surface, and have a smooth edge: within they are radiated with lamellæ, like those of the *asteræa*. The colour of this species is a fine, bright white; and its surface between the pores is bright and glossy. It looks perfectly smooth, till closely examined; but it is then found to be lightly striated, especially in the larger parts of the plant. The branches, when broken, shew a solid texture, except just where the pores run; they are whiter within than on the surface, and the constituent matter seems very like that of red coral.

It is found on the rocks, under water, about the shores of Italy, and in many other places. Tournefort calls it *Madrepora vulgaris*; C. Bauhine, *Corallium album oculatum officinarum*.

2. *Madrepora striata poris minoribus frequentioribus.*

The striated Madrepora with more frequent and small pores.

This is an extremely elegant plant. It rises with a single stem, of an inch, or more, in diameter, which soon divides itself into a great number of branches; and these send off others, till, from the whole, there is formed a beautifully ramose figure, of a foot or two in height, and nearly of as much in diameter. The branches are many of them as thick as a man's thumb; they are usually a little crooked, and all point upwards. The whole plant is usually of a beautiful white, sometimes greyish, and is very brittle, which is owing to its being very porous. The surface is all over covered with little prominences, of the bigness of half a barley-corn, or thereabout. These are broadest at the base, and smaller at the point, and are lamellated very finely and beautifully on the outside. These lamellæ are continued from the summit of one protuberance to the base of another, and, by that means, form the striated surface of the whole plant: these protuberances are the tubules of the pores: they are all open at top, and are beautifully lamellated within, their lamellæ, like those of the external surface, being extremely thin and fine. If a branch is broken, it is found to be of an extremely lax and cavernous texture, and every pore of the surface is seen to be carried down to the center, where there runs up another cavity, filled with lamellæ, as the rest are, up to the summit of the plant.

This is frequent about the shores of the East Indies, and is sometimes met with about those of the Caribbee Islands; it grows to the rocks, at a little depth under water.

3. *Madrepora poris depressis.*

The Madrepora with depressed pores.

This is a very beautiful species of *Madrepora*, and very different in its structure from most of the others; it does not grow to the height that many of them do, but it expands sufficiently in breadth, and its branches are not round, but flattish. It rises with a single stem, of a very irregular figure, protuberant, but flattish; this, at the height of an inch or two, divides into several branches, which usually extend themselves horizontally, and are flat, often about an inch in breadth, and not more than a third of an inch in thickness: these also frequently send off other branches of the same figure; but some of these, as well as some of the large ones, approach more to roundness than the others. The whole plant often extends to a foot or more horizontally, though not above five inches in height. Its colour is a pure white. Its surface is covered with little roundish depressions, capable of admitting the head of a moderate pin; they stand very close to one another, and the interstitial matter between them is granulated: among these pores there rise also, on different parts of the branches, a vast number of little protuberances, about an eighth of an inch in length, and nearly as much in diameter, and of a perfectly irregular figure: these are not the tubules of pores as the pro-

protuberances on the surface of the former species are, but are solid, and themselves covered with depressed pores on their surfaces, like the rest of the branches. The bottom of these depressions seems solid, but, when nicely examined with a microscope, it is found to be full of small holes, which communicate with cavities within. A branch of this species broken appears of a very beautiful white, but full of pores and cavities; there runs along the center of every branch, indeed, a cavity, furnished with it's lamellæ, affixed to an axis in the middle; and from this are propagated other cavities sideways, formed in the same manner, and communicating with the pores or depressions on the surface.

The descriptions botanic writers have given of these bodies are so very imperfect, that it is not easy to say whether any of them have described this, or whether it is a new species. I received it from the East Indies, where it is common on rocks under twenty or thirty feet water.

4. *Madrepora ramosissima poris minimis.*

The most branched Madrepora with very small pores.

All the Madreporæ are beautiful, but the elegantly-branched figure of this gives it a superior beauty to them all. It rises from a broad base, fixed to a rock, with a single stem, of the thickness of a man's thumb; this continues naked for four inches, or thereabout, after which, and sometimes sooner, it begins to divide into a number of branches. It grows in the whole to about a foot in height, and eight or ten inches in extent. It's branches are beautifully ramified, till at length they terminate in portions scarce thicker than a packthread; and they send out a number of these small shoots also sideways, whence the whole has much the appearance of a shrub, with branches and leaves upon it. The stalks are all round, and are beset with multitudes of extremely small pores, which scarce have their edges at all raised above the rest of the surface: these pores stand very close, but the interstitial matter between them is also porous. The pores of the larger kind are scarce big enough to admit the head of a small pin, the others are hardly distinguishable by the naked eye. The plant is brittle, and it's branches, when broken, appear cavernous or spongy. Clusius was the first author who described this plant; his description is but imperfect; his name for it, Abrotanoides, planta faxea. Boerhaave calls it also Madrepora abrotanoides, as have most of the other botanical writers, from a supposed resemblance of its finest ramifications to the leaves of the abrotanum fœmina. It's general colour is a beautiful white, but it is sometimes found greyish or yellowish. It's ramifications also usually terminate in sharp points, but they are often found obtuse and rounded, by the motion of the water. Authors have made three several species of it: 1. Yellowish Madrepora abrotanoides. 2. A grey one with sharp-pointed tops; and, 3. A grey one with obtuse tops. It is found deep under water near the East Indies, in considerable abundance. It grows to the rocks or to loose stones.

These are the most beautiful and the most singular species of the Madrepora; and they explain the four several appearances of the plants of this genus. Many authors have extended the number of species very far, by reckoning the varieties of one or other of these, or the others, as such: the real, distinct species, however, beside the four already described, are, 1. The great tree Madrepora of authors: this grows to two feet high, and is two inches or more in diameter at the base. 2. The great stony Madrepora. 3. The coral-like Madrepora with a smooth surface. 4. The little Madrepora with very small pores. 5. The Madrepora with larger tubercles. 6. The bladder Madrepora. 7. The brown, small, starred Madrepora. 8. The cypress Madrepora: this much resembles the last of those described here, but it's ramifications are shorter. 9. The buckthorn Madrepora. 10. The broad-branched Madrepora. 11. The Madrepora with foliated extremities. 12. The fibrose Madrepora: this is distinguished from all the others by it's being covered with stony excrescences, as fine as hairs.

After the generical characters and descriptions of the former species, these will easily be known by the characters conveyed in their names.

SUBMARINES.

SUBMARINES.

Class the First. Genus the Fourth.

ESCHARA.

ESCHARA is a genus of Submarines, composed of a gritty matter, but not very hard, of a reticulated texture, and sometimes disposed into the form of leaves; always consisting of a thin expanded matter, perforated with numerous holes, roundish, oblong, or irregular in figure, and these so close to one another, and so equally continued through the substance, as to give the whole the appearance of a net.

1. *Eschara latissima undulata.*

The undulated broad Eschara.

This species adheres to rocks or stones by a broad base; from this it rises in form of a thin and flat undulated crust, narrowest at the base, and expanding itself toward the extremity. Sometimes a single body of this kind, sometimes several such arise from the same base. They are six or eight inches over in their broadest part, and are irregularly curved, and jagged at the edges, and sinuated round the top; they sometimes rise perpendicular, sometimes grow out horizontally; they seldom exceed the thickness of a crown-piece any where, except near the base, and toward the extremities they are much thinner. They are every where pierced with irregular holes, and those placed so close to one another, especially toward the extremities, that the interstitial matter only forms irregular lines of no great breadth between them; nearer the base it is more solid, and the holes are fewer. Its genuine colour is a pale, greyish brown, but it is often found quite white. It grows usually under twenty or thirty feet water, sometimes in shallower places; seen in its growing state, it makes a very beautiful figure, but it is very rare to have it taken up entire. It is so brittle, that the least violence breaks it to pieces.

It is common about the shores of the Mediterranean. Imperatus calls it Retepora; others, *Eschara marina*, and *Porus reticulatus*; Cæsalpine, by the strange name *Rosa marina*.

2. *Eschara marginibus cauliculatis.*

The stalky edged Eschara.

This is to the full as elegant and beautiful a plant as the former. It rises from a broad, smooth base. Two or three, sometimes more plants of it, arise together; sometimes only a single one. Each plant is somewhat like a large oblong leaf in form, but very different in texture. It is formed of a gritty matter, two inches or more broad near the base, and a third of an inch thick; from this part it lengthens and expands itself in an irregular manner, growing to six or eight inches long, and nearly as much in width; it is deeply jagged at the edges, and at the top. Its whole substance is pierced with a great number of pores or holes of an irregular figure, but what is singular in it is, that all round its edges and ends there grow a short kind of stalks of a flatted figure, and of the thickness of a small packthread; these unite with one another at their ends, and by the extremities of their several ramifications, and by this means form a perfect resemblance of a net; the stalks themselves looking like the cords or thread, and the cavities between them resembling meshes or holes. This elegant and open reticulated edge gives a great beauty to the plant; the whole of it is of a fine white colour. It is frequent about the shores of the East Indies, but it is so brittle, that we very rarely meet with a tolerable specimen of it.

J. Bauhine has described it under the name of *Eschara marina frondipora*; and C. Bauhine and Imperatus, under that of *Frondipora* and *Eschara marina*.

3. *Eschara ramosa dichotoma.**Branched dichotomous Eschara.*

This is an extremely singular species of *Eschara*, softer and less brittle than either of the others, but of the true reticulated texture, which distinguishes the genus.

It grows to stones, shells, or other substances lying at the bottom of the sea, by a broad base; from this it arises flat and thin, and of about half an inch, or less, in diameter. It does not continue single a quarter of an inch, but often immediately from the base divides into a number of branches, six, eight, or more; these divide again at an inch height, and their ramifications divide yet again. The division is always into two, or in the Dichotomous order. The several branches are narrow at their base, and grow gradually broader all the way to the extremity. They form a large cluster upon the whole, of a roundish figure, three or four inches in height, and as much in diameter. The branches are scarce a sixth of an inch broad near the base, and half an inch or more at the top. They are no where thicker than a coarse paper.

The whole plant is of a pale, brownish white colour, and of a somewhat gritty, friable texture, but much less stony between the teeth, and less brittle than either of the former. It is all over of a very elegantly reticulated texture; the holes are capable of admitting the head of a very small pin, and they stand so close, that the divisions between them are scarce so thick as the finest hair. The holes are of an oval figure.

The plant, in its manner of growth, extremely resembles some of the dichotomous fucus's, and has been thence called by Ray and other authors, *Fucus telam lineam fericeamve textura sua amulans*. John Bauhine calls it *Alga marina platyceros porosa*; and Imperatus, *Porus cervinus*. It is frequently thrown up on our own coasts.

It is a wonder that authors should not consider, before they ranked this with the fucus's, that it is not tough like them, but fragile, and may be rubbed to pieces between the fingers.

4. *Eschara convoluta.**The convoluted Eschara.*

This is a very singular species. It grows to stones, shells, or other solid substances, at the bottom of the sea, by a flat and broad base. From this there arise five or six stalks of a flattish figure, hollow, and of the thickness of a small thread; these immediately divaricate into a number of others, and become so very numerous, that they form a cluster of an inch diameter, which is more than their utmost height. The branches are strangely twisted and entangled among one another, and they coalesce at their extremities and in many other parts, so as in the whole to form a kind of network, the solid substance of which is much more in quantity, than the cavities or meshes. The whole plant is of a beautiful white colour, and often, by its various inflexions and coalescences of the branches, forms in the whole a sort of globular figure. It is brittle, and easily ground to powder between the teeth. It is frequently cast up on the shores of the Mediterranean, but is so little regarded, that we seldom meet with it in the collections of the curious. J. Bauhine and Ray seem to have described it under the name of *Reticulatum tophaceum marinum*. Bauhine says, the cluster of it resembles a net wound up into a bundle, which is a very just observation.

SUBMARINE S.

Class the First. Genus the Fifth.

TUBULARIA.

TUBULARIA is a genus of Submarines, consisting of cylindric tubes, rising from a thin crust of the same matter with themselves, which is of the hardness and structure of coral. Of this singular genus we at present know only one species.

Tubularia

TUBULARIA.

The first appearance of this elegant body is a thin crust of a purple coralline matter, extending itself over any solid substance, and conforming itself to its shape. This is of the thickness of a common writing paper, or a little more, and of a smooth surface. From this there soon arise a number of hollow cylindric bodies, of the same colour, and formed of the same matter with the crust. These are of the thickness of a large packthread, and run up naked to about a third of an inch in length; they are very thin in the crust, and contain a simple cavity within; at the height of about a third of an inch, there is formed another crust like that from which the tubes arose; this forms an even surface about the tubes, whose tops stand a little way above it, and are there closed with a transverse septum of the same matter with the rest. From this crust the tubes are continued a third of an inch more, where there is another such crust, and so on to the top. The tubes generally grow in great clusters, two or three hundred together, and are connected firmly at these short distances by the crusts: the whole often rises to three or four inches in height, and is of two inches or more in diameter. Its upper surface is composed of a crust like the rest, with the mouths of the tubes just appearing above it, and seeming prepared for a continuation of growth as from the base; it is frequent to see from six to ten or twelve of these crusts in a mass, distinguishing it as it were into so many series of tubes, though in reality the same tube is carried up all the way from the base to the top, only separated in its cavity by these transverse septa. It is common about the shores of the East Indies, and adheres usually to the large corals, sometimes to shells or stones. It is throughout of the colour of red coral, and makes a very beautiful appearance. Imperatus calls it *Tubularia purpurea*; and C. Bauhine, *Corallis affine alcyonicum rubrum*.

SUBMARINES.

Class the First. Genus the Sixth.

ACETABULUM.

ACETABULUM is a genus of Submarines, consisting of a single stalk, sustaining at its summit a round body, at first hollowed like a funnel, but afterwards flat. There is only one known species of this genus. Tournefort, C. Bauhine, and some others, have indeed mentioned two, a larger and a smaller, but they are evidently no more than the same species in a different state.

ACETABULUM.

This elegant little plant rises with a single stalk, of the thickness of a coarse thread, and of an inch and half, or two inches in height; this is simple, unjointed, and hollow: at its top it expands at first into a conic cavity, which by degrees enlarges till the whole plant resembles a little funnel, with a very long stem. After this the top by degrees grows more and more flat, till at length it is perfectly so; and is then nearly of the breadth of a six-pence, and as thick as a coarse paper. It is perfectly round, and has a rim of a thicker matter than the rest, running round it like a packthread; the stalk is inserted in the center of this body, and from that center to the circumference, both on the upper and under side, there run a great number of lines. The whole plant is of a greyish colour. It grows to shells, stones, and a variety of other things under water. The botanical writers in general have described it. J. Bauhine calls it, *Androsace five umbilicus marinus*, and *Fungus petræus marinus*; Parkinson, *Cotyledon marina*. Any name is better for it than *Androsace*, because that was the name of a very different plant among the Greeks.

SUBMARINES.

Class the First. Genus the Seventh.

ORMUS.

ORMUS is a genus of Submarines, composed of a considerably hard matter, formed into short and broad joints, which are fastened in several series one to another, without any pedicles, and in such manner, that they resemble a string of beads in a necklace. The manner of these several joints growing, as it were, out of one another, has some sort of resemblance to that of the leaves of the Opuntia, whence many have called the plants of this genus Opuntioides. There are only two species of it known.

1. *Ormus segmentis brevibus latis.*

The broad and short jointed Ormus.

This elegant and singular plant grows to rocks, stones, shells, or other substances at the bottom of the sea, by a small flat base; from this rises a single joint, which is usually about a quarter of an inch long, and near as much in breadth at the top, but narrower at the bottom. It is flat in its whole length, but considerably thick; from this single joint there arise two or three others of the same form, but broader a little; these immediately furnish each several others, and these last send out others. Each of which, as the first, produces several more joints, all seeming to grow out of one another: they are fastened to each other, without any pedicle. Four, five, six, or more of these, grow in each series, so that, from the single joint at the bottom, the plant grows to about two inches in height, and as much or more in breadth. The succeeding joints are shorter and broader than the two or three first; they are joined to the head of the last by a broad base, and from this extend into a semicircular form; they are in general somewhat broader than they are long, and are undulated at the extremity where they are circular. They are considerably thick and of a gritty substance. The whole plant is naturally of a white colour, but it is sometimes tinged to a reddish, sometimes to a greenish or yellowish hue. It grows to shells and stones at the bottom of the sea, and is common about the shores of America in several places. Boerhaave calls it *Opuntioides marina parva forma trichomaris*; and Sir Hans Sloane, *Corallina opuntioides ramulis densioribus & foliis magis sinuatis & corrugatis*.

2. *Ormus segmentis rotundioribus.*

The rounder segmented Ormus.

This grows to four or five inches in height; its segments or joints grow one out of another, in the same manner as those of the former, but they are larger, and of a more rounded figure. They are of the same colour and consistence, but they are less thick in proportion to their size. The whole plant is frequently of a greenish colour. It is found about the shores of the Caribbee Islands, and in the East Indies. Imperatus has described it under the name of *Sertularia*; and J. Bauhine under that of *Opuntia marina*.

SUBMARINES.

Class the First. Genus the Eighth.

CORALLUM.

CORALLUM is a genus of Submarines, composed of a hard, stony matter, formed into ramifications, and resembling the trunk and branches of a tree; solid throughout, and not porous, spongy, or stellated on the surface. Often covered with a bark of a softer matter, which easily falls off; sometimes naked.

1. *Corallium*

1. *Corallum rubrum.*

Red Coral.

This deservedly stands at the head of the Coral class, as more beautiful and more useful than them all. It grows from a broad base, extending itself over any thing solid, and conforming to it's shape; this often spreads to two, three inches, or more, in diameter; often it is not half an inch; it is commonly of about the thickness of a shilling, and of the same colour and consistence with the rest of the plant. From this rises usually a single stem, sometimes two or three grow from the different parts of the same base, and often these join in their growth up, and, at an inch or two distance from the base, form only one common stem. The thickness near the base is from that of a man's finger to near an inch in diameter, and it's height from five or six inches to a foot or more. The main trunk sends off from every part considerably large branches, which again divide themselves into others, and form, upon the whole, a very beautiful appearance: they sometimes grow out irregularly, and on all sides; sometimes only opposite, or nearly so, to one another, and then the whole shrub has a flat form. The stem and the main branches are full of little knots and depressions. We meet with Coral in its ramified state smooth on the surface, and of a fine red; but we are not to suppose this to be it's state in the sea. It's surface is deeply striated naturally, and it is wholly covered with a crust of a fungous substance, full of an acrid milky juice, and not of the fine florid red of the Coral, but of a yellowish, greenish, or orange colour. This crust is covered all over with little granules, and in the center of every one of these there is a hole, which seems contrived for receiving the nutritious matter from the water. Beside these granules, there are also other papillæ in the crust, which are open at the top; the opening sometimes is simple, sometimes divided into six parts; these are divided within into little cells. The internal surface of the crust is striated deeply, as well as the external one of the stony part; and these striæ are so adapted one to another, that they form so many tubules, running from top to bottom of the plant, and along every branch of it, in great numbers. There are cells in the stony internal matter, as well as in the external crust, and these, as well as the others, are filled with a whitish acrid liquor, and the tops of the branches have tubercles of the cortical matter, divided into several cells within, and full of the same milky and acrid juice. This species is found on the coasts of the Mediterranean, and in several other places, where it is dragged up with particular engines in great abundance. It is described by all the botanical writers under the name of *Corallium rubrum*; and some of them tell us they have seen octopetalous radiated flowers, standing in cups, arising from the tubercles of the bark. Red Coral is used in medicine as a mild astringent, and as an alkali and absorbent, with good success. The other species would probably answer the same purposes, but they are not used.

2. *Corallum album.*

White Coral.

This much resembles the red Coral in its manner of growing, except that it is more branched. It arises from a broad base, conforming itself to the shape of the substance it grows upon, extending to two or three inches in diameter, and of the thickness of a coarse paper. From this base there arises a thick and irregularly-figured stem, sometimes roundish, often flatted and protuberant in various places. This sometimes continues single, sometimes divides, at half an inch, or less, height, into two or three trunks: if there are more than one of these trunks, the plant is the smaller, but the more bushy; if only one, which is the most beautiful state, it rises to six, eight, or ten inches high, divaricated into a multitude of branches, and each of these sending off other smaller and shorter ones: the branches are round, and often meet and inoscuate with one another. The surface is perfectly smooth, not striated, as that of the red Coral; and the whole plant of a beautiful white colour. When taken into the hand it is found to be vastly lighter than red Coral, and when broken is found of a much less compact and solid texture. It is found about the shores of the Mediterranean, growing to rocks, stones, or any thing solid, and is often brought up in fine pieces. Ray tells us he saw several fine shrubs of it offered to sale at Genoa. The botanical writers have all called it *Corallium album*; but most of them have also described other things

under this name: the madreporæ of several kinds, in particular, are pretty currently called white Coral, and sold for it in the shops.

3. *Corallum nigrum.*

Black Coral.

The general practice of receiving the madreporæ into the shops under the name of white Coral, and of receiving also the ceratophyta under the name of black Coral, has taught many people to believe that there was not, in reality, any such thing as either white Coral or black Coral in the world; but people who have examined into things more deeply find it otherwise: black Coral is indeed too scarce, and too much out of use in medicine, to be expected in the shops at this time; but specimens of it are frequent in the cabinets in Italy and Germany, and tolerably handsome plants of it are at times drawn up among the red.

The genuine black Coral grows to rocks, and other solid bodies, by a broad and thick base; from this it rises up usually in a single stem, of the thickness of a man's finger; this runs up single for three inches, or thereabout, and then sends off a branch, and usually three or four more, at different distances, higher up: these do not often send out other branches, but run single their whole length, which is often two inches, or more. The whole surface of this Coral is naturally striated, but this is usually polished off, before it is offered to sale. It is as heavy and as hard as the red Coral, and is of a fine shining black colour. When broken it appears of as compact a texture as the red. It is sometimes dragged up on the coasts of the Mediterranean; we sometimes also meet with fragments of it among the sea plants sent over for sale. Ray tells us he often met with it among the Italian naturalists; and the king of Prussia, we are told, at this time has a fine shrub of it: Boerhaave also gives us an account of a specimen he had of it, which is still at Leyden.

4. *Corallum album geniculatum.*

Geniculated white Coral.

This rises from a broad and irregular base, considerably thick, and of a white colour. The stem is usually single at the base, and divides afterwards into several branches: the main stalk is usually of the thickness of a man's thumb, or more, and the height of the whole plant not less than a foot and a half. Its branches are composed of oblong segments, or joints, half an inch or more in length, so that they represent the stock of the common horse-tail. The whole plant is of a yellowish-white colour, striated on the surface, and of a tolerably solid texture, between that of the madreporæ and that of the common white Coral.

This is found on the shores of the East Indies. Boerhaave calls it *Corallium album geniculatum*; and Clusius, *Hippuris saxea*.

The Corals are so much alike in their growth, that the other species, after the descriptions of these, will easily be known by their names. They are, 1. The little, white Coral, brittle and ramose. 2. The thin, branched, brachiated, white Coral. 3. The brownish-grey Coral of Spain, 4. The thin, brittle, tufted, white Coral. 5. The slender, very-much branched, little Coral. 6. The white, digitated, flat-branched Coral. 7. The great yellowish Coral. 8. The great, white, ramose Coral, with red tops. 9. The brittle, very ramose, yellowish Coral. 10. The little, mossy, brittle, white Coral, growing in thick tufts. 11. The little, geniculated, white Coral, with white, multifid tops. 12. The white, capillaceous, geniculated Coral, with branched tops. 13. The capillaceous, pale-red, geniculated Coral, with branched tops. 14. The red, geniculated Coral, with capillaceous branches and ramose tops. The four last are very small, but very beautiful Corals. Authors have described many more species under the name of Corals, as the stellate and oculated Corals, so called from the figures of stars and eyes on their surfaces; but these are properly madreporæ, and have been already described under that genus.

SUBMARINES.

Class the First. Genus the Ninth.

CORALLINA.

CORALLINA is a genus of Submarines, consisting of stalks and branches, often beautifully ramified, and composed of joints of an oblong figure, inserted into one another. The greater part of these are gritty, and of a Coral-like matter, but nature varies from this in some of the species, which are of a softer substance.

1. *Corallina segmentis longioribus.**Coralline with long segments.*

This is a bushy plant, much divided in it's branches, and usually growing in great clusters together. It rises to two or three inches in height, and often extends to as much in diameter in the whole cluster. The main stalk is of the thickness of a small pack-thread, and is composed of a multitude of joints or segments, which are twice as long as they are thick, and are all regularly figured, being thicker at one end, and smaller at the other: the smaller end grows downwards, and is inserted into the larger end of the joint below; so that the whole plant consists as it were, of a series of cups, with narrow mouths, and narrower bottoms, inserted into one another. There grow many branches from the main stock, and these are sometimes ramified again, but they are always short. The whole plant is sometimes of a white, sometimes of a greyish, and sometimes of a greenish, reddish, or yellowish colour. It consists of a gritty matter, and is easily rubbed to powder: it's taste is very nauseous. It grows to stones, shells, and all other solid substances, under water, and usually in thick tufts, or clusters. Cæsalpinus says it is soft, while in the water, and grows stony on being exposed to the air; but he errs in this. It is common about our own coasts. Authors have called it *Corallina Anglica*, and *Corallina officinarum*. It has been long celebrated for its virtue against worms, and is given, from ten grains to two scruples for a dose, with very good success.

2. *Corallina pennata denticulata.**The pennated and denticulated Coralline.*

This is a very beautiful and regular little plant. It grows to the height of two or three inches, and it's utmost breadth is about three quarters of an inch. It rises with a single stem or stalk, which continues undivided to the top, and from which there issue a number of branches, disposed in a very regular order: they are single, and the longest are somewhat more than a third of an inch long; these are in the middle of the plant, and from this they are gradually shorter to the bottom, and to the top they are placed in the same plane opposite to one another, or nearly so, so that the whole plant has much the appearance of some of the pennated leaves. The main stalk and the branches are all of the same structure, composed of short joints, and those disposed in such a manner, that the branches appear denticulated. The whole plant is very rigid, and of a pale-brown colour. It grows from a small, flat base, and usually single. It is frequent about our own coasts, growing on small stones, and often on oyster-shells. Authors have supposed it to resemble the fir-tree in it's regular growth, and have thence called it *Abies marina Belgica*. Tournefort calls it *Corallina marina abietis forma*; and C. Bauhine, *Muscus marinus filicis folio*.

3. *Corallina ramulis falcatis.**The falcated Coralline.*

This is an extremely elegant little plant: it rises to four or five inches height, but it's stalk is so weak that it is scarce able to support itself erect at that height. It usually grows single, and is branched from top to bottom. The main stalk sends out a branch or two every half inch, or at nearer distances; and these ramify into a multitude of others, which are all much of the same length, and all of them bend at their ends in such

such manner as to resemble a reaper's sickle. The main stalk is rigid and firm, though very slender; the branches are composed of short joints, so disposed, as to give the whole a denticulated figure, and in the alæ of the denticulations there are frequently found a kind of oval bodies, hollow, and striated transversely; the same sort of capsules are also found on many of the other species, but their use is not yet discovered. The whole plant is of a pale-brown colour. It grows to oyster-shells, and other marine bodies, sometimes to the other sea-plants, and is common about our own coasts. Plukenet calls it *Corallina muscosa pennata ramulis et capillamentis falcatis*; and Johnson, *Musculus marinus pennatus*.

4. *Corallina simplex cirrata.*

Simple cirrated Coralline.

This is a very singular species: it consists of a single stalk, of three, four, or more inches in length, neither divided, nor sending out any branches, but continuing simple from the base to the summit. It is composed of a multitude of short, cylindric joints, and at the head of every joint it has five little cirri, looking like the rudiments of hairs. The stalk itself is not larger than a thick horse-hair, and is somewhat rigid, and of a brown colour. There generally grow a great multitude together, so that they support one another, but, otherwise, their length is almost too much for their diameter. The stalk has a cavity running all the way up it, and in the whole resembles nothing so much as the horn of a lobster, whence it has been called, by the generality of writers, *Corallina astaci corniculorum æmula*. It is frequent on our own coasts, and sometimes found on oyster-shells, as many other of the Corallines are.

After the description of these four species, the names alone will be sufficient to distinguish the others. They are, 1. The small-branched Coralline, with round capsules at the indentings. 2. The small, snow-white, branched Coralline. 3. The capillaceous, multifid Coralline, called the Fine-haired sea-moss. 4. The tall, white, capillaceous, leaved Coralline. 5. The round-jointed, soft, branched Coralline. 6. The purple, compressed Coralline. 7. The branched, cirrated Coralline. 8. The broad, denticulated Coralline. 9. The branched Coralline, with the denticles in two rows, turned the same way. 10. The thick-stalked coarse Coralline. 11. The erect, very-much branched, silvery Coralline. 12. The procumbent, denticulated, branched Coralline. 13. The little, creeping, denticulated Coralline. 14. The dwarf, erect, ramose, denticulated Coralline. 15. The simple-denticulated Coralline. 16. The hollow-jointed Coralline. 17. The capillary, hollow-jointed Coralline. 18. The threaded, short-jointed, hollow Coralline. 19. The purple, narrow-leaved Coralline. 20. The black, multifid Coralline. 21. The green, multifid Coralline: both these become white with lying on the shores, but they even then are evidently different from any other species. 22. The dodder Coralline. 23. The abrotanum, leaved Coralline. 24. The elegant, silvery, fine-divided Coralline.

Linnæus has figured many of these Corallines under the name of receptacles of insects, and supposes them not of vegetable origin. The French have lately, also, extended this doctrine to the corals, and many other of the sea-plants, all of which they make not to be vegetables, but cases made by insects. We do not find this, however, sufficiently proved at present, to authorise the throwing this set of bodies out of the vegetable world. In a work where a general history of plants is to be comprised in a small volume, we have no room for controversy; but this is certain, that many of the species, called by these authors the cases made by insects, may be proved to be vegetables, as much as daisies or lillies are so. We allow that some inaccurate authors may have described cases of insects under the name of plants, and that sea insects may inhabit sea-plants, as the hexapodes of beetles, &c. do trees, or other insects (the mineurs de feuilles of Reaumur, &c.) do plants: but we are not, therefore, for supposing all sea-plants to be cases of insects, nor all of them even to afford niduses for animals, because some of them do so.

SUBMARINES.

SUBMARINE S.

Class the First. Genus the Tenth.

ALCYONIUM.

ALCYONIUM is a genus of Submarines, consisting of a rigid, fibrose matter, disposed in various forms, but always laid together in a lax manner, so as to be in most species compressible. Sometimes covered with a crust of it's own matter, more closely arranged, and forming a hard coat for the rest, but more often naked; and in some of the species, the least resembling a plant of any thing of the Submarine class, in it's external appearance. There is no term in botany that has been more abused, or employed in so many improper senses, as this Alcyonium. Authors have described many things which are not distinct vegetables under it; some of them really niduses of insects, some of them only congeries of the fibrous matter of other plants. We are not for this reason however to conclude, that there are no Alcyonia truly vegetable, of distinct and determinate kinds.

1. *Alcyonium divaricatum.*
Divaricated Alcyonium.

This grows to the rocks or other solid bodies under water, by a broad and thick base, composed of a multitude of fibres variously interwoven and entangled. From this base there arise two or three branches, each spreading out into several ramifications; the whole branches are often eight or ten inches long. It is rounded at the bottom, and an inch and half or more in diameter; but, as it branches out, it becomes flat; many of the ramifications are two inches broad, and not half an inch thick, and the whole has something of the rude figure of an elk's-horn. It is of a brown colour, and of a somewhat rigid, yet compressible matter, and is all formed, like the base, of a number of thready filaments, strangely interwoven and entangled, and often coalescing together; the ramifications from the main branch often coalesce where they meet. The constituent matter seems something of a middle nature, between that of the Echaræ, and that of the Sponges.

This species is not uncommon on the coasts of America. Clusius calls it *Alcyonium monstrosum*; and C. Bauhine, *Alcyonium cervi cornua referens*.

2. *Alcyonium coralliforme.*
Coral-like Alcyonium.

This is an extremely elegant and beautiful plant, and is the most singular in its appearance of any thing of this kind; at a distance it perfectly resembles a shrub of coral, but that it is of a yellowish colour; but, when examined, it is found to be composed merely of fibrous and ramose capillaments, wonderfully arranged into that general form, and is so extremely light, that the largest pieces of it have scarce any sensible weight in the hand. It rises from a thick and coarse base, formed of a multitude of fibres, strangely entangled together and extending themselves, in a cake of several inches diameter, over stones or rocks; from this it rises with a main trunk of an inch or two in diameter, and this divides into several ramifications, each of which afterwards sends off its several branches. These are all round in figure, though composed only of fibres standing at a considerable distance from one another, and so remarkably arranged and terminated, that they all end in the circular circumference allotted to the branches. The whole plant is of a yellow colour, and the branches are somewhat compressible, though the fibres they are composed of are considerably rigid. It is frequent on the coasts of the East Indies, where it is thrown up by the waves. It naturally grows under twenty or thirty feet water. Many of our collectors of natural bodies have it in their museums, where they call it the wire sponge, or sponge coral.

3. *Alcyonium rotundum cavum.*
Round hollow Alcyonium.

This is a very singular species, tho' less beautiful than the two former. It grows to the rocks by a circular rim, surrounded with a multitude of fibres. The rim is about an eighth of an inch broad; the circle it makes is often three quarters of an inch in diameter, and the internal space has no part of the plant annexed to it. From this circular base the plant extends itself to the bigness of a man's fist, but the hollow still continues. The whole consists only of a crust of a sixth of an inch, or thereabout, in thickness, which is composed of rigid fibres, arising from the circular base, and running through the whole plant, variously entangled with one another, and frequently meeting and coalescing together; these fibres are so numerous, and so well connected by their inosculation, that they form a continuous substance close toward the surface, but more lax within, and of a middle degree of density between the two species already described. The cavity contained within this globular case is large, and is always full of sea-water. The plant is sometimes of a greenish, but more usually of a brownish yellow colour; but it grows white, on being beat about on the shore. Imperatus describes this under the name of *Aurantium marinum*; others call it *Bursa marina*, and *Pannum marinum*. It is frequent about the coasts of the Mediterranean.

4. *Alcyonium ovatum cortice duriori.*
The oval Alcyonium with a hard coat.

This species somewhat resembles the former in shape, but it differs greatly in its structure. It rises from a circular base, and usually there grows from this a cylindric neck, short and thick, which from its top expands into an oval figure. The whole plant, as in the former species, is composed of rigid fibres, variously entangled one with another, but they are laid less close together. The surface is covered with a kind of bark, formed of the same fibres, more closely interwoven, and frequently inosculating and cohering one with another. This crust is but thin, but all there is of the fibrous substance, that composes the plant, is propagated from it toward the center. The colour of the whole is a brownish grey, its size very uncertain. I have seen mosses of it twice as big as a man's head, but the bigness of an orange is its more usual size. It is often thrown up on the coasts of Italy. It sometimes grows to stones, sometimes to other sea plants. Imperatus has described it under the name of *Alcyonium tuberosum*; and C. Bauhine under that of *Alcyonium forma alicujus ficus*.

The other species of the *Alcyonium*, properly so called, will be understood sufficiently by their names, after these descriptions of the more singular ones. They are, 1. The harder, spongy, and porous tuberos *Alcyonium*. 2. The funnel-shaped *Alcyonium*. 3. The soft branched *Alcyonium*. 4. The great, hard, arboresecent *Alcyonium*. 5. The yellowish, ramose, and softer *Alcyonium*. 6. The ramose scabrous *Alcyonium*.

S U B M A R I N E S.

Class the Second. Genus the First.

Those of a firm texture, tough and elastic.

C A M P Y L I U M.

CA M P Y L I U M is a genus of Submarines, consisting of a tough, flexible matter, usually formed into a kind of shrubby appearance, and covered with a hard or gritty crust, in which the fructification seems to be placed in little granules with open tops. The *Campylia* agree with the corals, in the having this kind of crust for this purpose; they differ from them in their wanting the stony hardness, which characterises the others. The botanical writers in general have agreed to arrange these plants into a genus by themselves, but they have called them by generical names, not properly expressive of them. Tournefort calls them, *Lithophyta*, or stony plants, a name

name that any body will perceive belongs not properly to them, but to the corals. Linnæus calls them Lithoxyla, expressing them to be partly of a woody, partly of a stony nature; and Boerhaave, according to the hardness of their crusts, arranges them into two genera, under the names of Ceratophyta and Titanoceratophyta. As what has been meant to be expressed by these generical names, has been principally the flexile texture of the plants, which some have expressed by resembling it to that of horn, others to that of wood, neither of which substances the plants themselves truly resemble; it seems more proper to call them by a name which expresses only their being flexile, without conveying an idea of a resemblance which does not exist. Linnæus seems not to have been aware, that his generical character of the Lithoxyla took in the corals, which he afterwards makes another genus.

1. *Campylium coralliforme.*
Coral-like Campylium.

This is the plant which we usually meet with, under the name of black coral. It grows from a flat base, of the thickness of a shilling, which extends itself for two or three inches over the rocks, and assumes the form of the part of them it grows on. From this base there usually rises a single stem, sometimes more, of the thickness of a man's little finger. This runs up single three or four inches, and then begins to divaricate and send off branches. The height of the whole plant is from eight inches to a foot or more, its branches seldom send out any other smaller ones; so that the whole represents very well a shrub of red coral, except that it is less thick in proportion to its height. Its colour is a dark brown, approaching to black; its surface is not perfectly smooth: it is extremely flexile, indeed it will not be broken without considerable difficulty. It is frequently found in this naked state, but, where perfect, it has a whitish crust, friable, and composed of a gritty matter extended over its surface; this is of the thickness of a shilling or more, and is beautifully marked with cavities and openings. Most of the botanical writers have described this species. Tournefort calls it, *Lithophyton nigrum arboreum*; and others, *Corallium nigrum*, and *Antipathes*. It is common about the shores of the Bermudas, and in many other places.

2. *Campylium ramosissimum fruticiforme.*
The shrub-like extremely branched Campylium

This is an extremely elegant plant. It grows to three or four feet high, and extends its branches to more than that measure in diameter. It rises from a broad and thick base, affixed to some rock or large stone, and conforming itself to its shape. From this there grows a stem or trunk of an inch and half or more in diameter; this rises single to the height of four or five inches, and then it begins to send out branches from space to space on every side; the largest of these are sometimes as thick as a man's thumb at the base, and a foot and half or more in length: these branches send off others, and those still send out more, so that the whole plant looks extremely bushy; the extremities of all the branches are long and slender filaments. While the plant is in the water, these extend themselves every way, and make a very beautiful appearance; but, when taken out, they droop with their own weight. The plant is of a tough, flexile matter, like the others of this class, and is, when perfect, covered with a crust, formed of a gritty matter, like that of the others, but of a very beautiful red colour, so that it adds greatly to the beauty of the plant. It grows about the Cape of Good Hope, near the island of Ceylon, and in some parts of the American seas. Most of the botanical writers have described it. Clusius calls it, *Frutex marinus elegantissimus*; and C. Bauhine, *Corallina cortice reticulato purpurascens*.

3. *Campylium ramosum reticulare.*
Branched reticulated Campylium.

This is another elegant species, very singular in its manner of growing. It rises from a large, flat, and very thick base. Its trunk is an inch or two in diameter. It is single to about five or six inches in height, but there divaricates into two branches, which soon after divide again, and send out a vast number of smaller ramifications.

cations. The plant grows to three or four feet high, and is very singular in this, that the branches do not go off every way from it, but all stand in the same plane, so as to make it quite flat and thin, though extended to a great breadth. The smaller ramifications are extremely numerous, and stand very close; they meet continually, and, wherever they do so, they inosculate with one another, so as to form in the whole a kind of net-work, with holes or meshes of different size. The plant is composed of a tough, firm, and flexile matter, and is covered with a beautiful purplish crust of a gritty substance, with a multitude of papillæ and holes in it. The extremities of the ramifications are extremely fine and slender. This species is frequent about the shores of the island of Ceylon, and in many parts of the East. The hard crust easily breaks off from this as well as the other species of this genus, so that we frequently meet with them either in part or entirely naked. Most of the botanical writers have described it. Clusius calls it, *Planta marina retiformis*; and Tournefort, *Lithophytum reticulatum aliud purpurascens*.

After the descriptions of these, which are the most singular species of the *Campylia*, the others will be easily distinguished merely by their names: They are, 1. The branched *Campylium*, with a white crust. 2. The less branched *Campylium*, with a purple crust. 3. The smaller *Campylium*, with a yellow, punctated crust. 4. The nodose *Campylium*, with a white crust. 5. The grey rugose *Campylium*, with a warty crust. 6. The branched *Campylium*, with a thin, smooth, yellow crust. 7. The great ramose *Campylium*, with a grey crust. 8. The great *Campylium*, with a blackish nodose crust. 9. The polypody-like *Campylium*, with a white crust. 10. The flat branched *Campylium*, with a greyish crust. 11. The black hairy *Campylium*. 12. The whitish hairy *Campylium*. 13. The convoluted, black, setaceous *Campylium*. 14. The thick-branched, variegated, white and yellow crusted *Campylium*. 15. The erect, ramose, tamarisk-like *Campylium*. 16. The nodose and corniculate *Campylium*. 17. The prickly fennel-like *Campylium*. 18. The flat-branched reticulated *Campylium*. 19. The abrotanum leaved white crusted *Campylium*. 20. The cypress-like *Campylium*. 21. The slender branched *Campylium*, with a red and yellow crust.

SUBMARINES.

Class the Second. Genus the Second.

SPONGIA.

SPONGIA is a genus of Submarines, consisting of a soft, tough, and elastic matter, formed usually into rude mosses of a cavernous structure, and having very little of the appearance of plants.

Upon a nice examination, these plants appear to be composed of capillary fibres, which are hollow, and are implicated in an amazing manner, and surrounded by thin membranes, which arrange them into a cellular form. The structure and constituent matter of the sponge renders it the fittest of all bodies to imbibe a great quantity of any fluid, and on a strong pressure to part with almost the whole quantity again.

1. *Spongia cellulis majusculis.*

Sponge with moderately large holes.

This is the sponge in common use with us on many occasions. It is a mere shapeless mass, growing under water: it is affixed to the rocks by a broad and firm base, and thence expands itself every way into a large and thick irregular lump, consisting of a tough matter, arranged into large pores. Its colour is a pale brown. It is frequent on the coasts of the Mediterranean, and in many other places; and, wherever it lies so that it can be easily come at, is taken up, and proves a very profitable branch of commerce. Tournefort calls this species *Spongia ad usum præstantissima foraminibus exiguis*; but there are other species, the foramina of which are smaller.

2. *Spongia*

2. *Spongia cellulis maximis.**Spunge with large cavities.*

This is distinguishable from the former species, as well by the largeness of it's cells, as by it's general appearance. The former is usually found in masses as thick as they are long; this, on the contrary, is almost always met with in flat or hollowed pieces: it usually adheres to the rocks by a broad base, from whence it expands every way in a circular, or less regular form, to the extent of a foot or two in diameter, and with three or four inches of thickness: It frequently is met with smaller than this, sometimes much larger. It sometimes expands itself quite flat, sometimes it is umbilicated, rising every way from the root, so as to form a kind of basin; and sometimes the base rises to an inch or more in height, and the body of the sponge thence expands itself into a hollow form, largest at top, and smaller at bottom: in whichever of these states it is found, it's holes are always much larger than those of the other, and it's substance coarser. Authors have made three species of it in it's three principal varieties of form: when quite flat, it is the *Spongia compressa magna* of Bauhine, &c. when in it's hollow form, without a pedicle, it is the *Spongia ingens anomala pelvim referens* of Boerhaave; and, when hollow with a pedicle, it is the *Spongia infundibuliformis* of Clusius, and of almost all the authors since his time.

It is frequent in all these appearances about the Cape of Good-Hope, and in some of the seas nearer home: it is often brought to us instead of the first kind, but it is not nearly so good.

3. *Spongia cellulis minimis ramosa.**Branched Spunge with very small cellules.*

This is of a very different appearance from either of the former; it is long, and divided into branches. It usually grows to some stone by a firm and not very broad base, from which it rises with two or three branches, of the thickness of a finger; these each of them divide into several others, and those are sometimes branched again: the several ramifications are roundish, but somewhat flattened; they are of the same substance with the other Sponges, but more densely put together, and the cavities much smaller. The colour is a pale brown. The length of the whole plant is often ten or twelve inches. It grows on rocks about the shores of Italy, and in many other places. Tournefort, and others, have described it under the name of *Spongia ramosa*; Lobel calls it *Conservæ marinæ* genus.

This species sometimes grows single, not branched, and extends to a great length. In this state Plumier has described it under the name of *Spongia Americana longissima funiculo similis*; and in like manner the first species, in it's several variety of shapes, has been described as several species, under the names of *Spongia tubo similis*, *Spongia favo similis*, *Spongia globosa*, and the like.

The species of Spunge have, indeed, been increased beyond all bounds by the error of taking varieties for distinct kinds: the only real distinct species beside those already described are, 1. The shrubby, branched Spunge, with moderately large holes. 2. The branched, river Spunge. 3. The hairy Spunge; and, 4. The woolly Spunge.

S U B M A R I N E S.

Class the Second. Genus the Third.

F U C U S.

FUCUS is a genus of Submarines, consisting of a tough matter, formed into a kind of leaves, which are flat, and are variously divaricated, sometimes dichotomously, sometimes perfectly irregularly; and which have some appearance of fructification, in punctuated tubercles, covering oblong vesicles, taken by Linnæus to be male flowers; and smooth, roundish vesicles, hollow, and interwoven with filaments, which appear to him to be female flowers. Mr de Reaumur has the honour of being the discoverer of this fructification, which Linnæus has from him, and does him due honour for, but there require further observations to confirm it.

1. *Fucus latifolia serrata*.
Broad-leaved, serrated *Fucus*.

This is the most common of all the species with us: it grows to the height of six or eight inches, sometimes more, and its leaves are near half an inch in breadth. It rises immediately in form of the leaf, without any pedicle, and of the breadth of a finger; as this leaf rises in height, it divaricates into two parts, and each of these into two more, and so on, till a great number of ramifications are produced, and all of them dichotomously, or by pairs. The whole plant is serrated at the edges, and is of a dusky-brownish colour, very tough and smooth on the surface. Its extremities frequently swell out into a sort of pods, rough on the outside, and of an oblong figure; and, beside these, it has a number of air-bladders, of a round figure, growing on the surface of the leaves, which burst with a noise on being trod upon.

It grows with us on all the coasts in vast abundance, covering most of the stones that chance to lie on the shore. The botanical writers have described it under the name of *Quercus marina vulgaris*, *Alga vulgaris*, and *Fucus*. It differs considerably in its form, according to the depth of water, and other circumstances, and has, in these several states, been described under the names of several different species. Dillenius has enumerated ten or a dozen of these varieties, described by others under the name of different species, in his edition of Ray's Synopsis.

2. *Fucus tenuifolia dentata*.
Narrow-leaved, dentated *Fucus*.

This is a much more beautiful plant than the former. It rises from a flat base, affixed to rocks or stones, with two or three, sometimes more, long and narrow leaves. It grows to twelve or fifteen inches in length, and is of a deep brown colour. Its first shoot is strait, and of the breadth of a straw; this soon divides, into several ramifications, and these subdivide again and again into several others; none of them are broader than the first, and they are all very sharply indented about the edges, the points made by the indenting terminating in a kind of weak thorns.

This species is frequent about our own shores. Ray describes it under the name of *Fucus tenuifolia foliis dentatis*. It sometimes swells into the same kind of vesicles at the end of the ramifications with the former, but more rarely.

3. *Fucus lato et tenui folio*.
The broad and thin-leaved *Fucus*.

This is a very elegant, but a very irregular species in its manner of growing. It rises from a flat base, with a narrow and thin leaf; this grows wider, as it extends in length, and soon begins to divaricate into several parts, but that not in a dichotomous manner. It grows to four or five inches in height; the segments toward the end are narrow, and sometimes, though rarely, they are formed into a kind of pods, like those of the common *Fucus*. The whole plant is of a tenderer texture than most of the *Fuci*, and is sometimes of a purplish, sometimes of a greenish, and sometimes of a whitish colour. It varies so much in its manner of growing, that it has been often mistaken in its several states for different species. It is common about our own shores. Ray calls it *Fucus membranaceus ceranoides varie dissectus*, others, *Fucus latifolius*.

The other species of *Fucus* are very numerous in nature, and much more so in the writings of authors, a great many of them, in their several varieties, having been described as distinct species. There is so much similarity in the general form and texture of these plants, however, that the other real species will easily be distinguished by their names. The more singular and more certainly distinct are, 1. The purple, narrow *Fucus*, called by the Irish *dulse*, and eaten as a remedy against worms. 2. The grey, narrow-leaved *Fucus*. 3. The fine-divided and variegated *Fucus* of the Cape of Good Hope. 4. The peacock-feathered *Fucus*. 5. The curled, variegated *Fucus*. 6. The long, narrow, and thick-leaved *Fucus*. 7. The narrow-leaved, round vesicled *Fucus*, called the sea-lentil. 8. The narrow-leaved *Fucus*, with long vesicles. 9. The heath-leaved *Fucus*. 10. The red-rattle-leaved *Fucus*. 11. The fœniculaceous *Fucus*. 12. The abrotanum-leaved *Fucus*. 13. The spongy and nodose *Fucus*. 14. The narrow-

narrow-leaved spiral or twisted Fucus. 15. The broader-leaved, larger, spiral Fucus. 16. The dwarf, broad-leaved, serrated Fucus. 17. The long, narrow, and thick-leaved Fucus. 18. The small, membranaceous, greenish Fucus, with extremely divaricated extremities. 19. The purple, membranaceous costated Fucus. 20. The tender, grass-leaved, dichotomous Fucus. 21. The coronopus-leaved Fucus. 22. The broad, Scotch, esculent Fucus. 23. The purple Fucus, with ligulated edges. 24. The broad-leaved, pinnated Fucus. 25. The elegantly-divided Fucus, with broader segments. 26. The scarlet, pennated, and variously-divided Fucus. 27. The purple, plumose Fucus. 28. The dodder-like Fucus. 29. The simple, long, and broad-leaved Fucus, called the sea-beet. 30. The thick, long, and broad-leaved Fucus. 31. The Fucus with a leaf like the *lepathum sanguineum*. 32. The hart's tongue-leaved Fucus. 33. The simple, long, broad, and very thin-leaved Fucus; and, 34. The variously-divided, long-leaved Fucus.

SUBMARINES.

Class the Third. Genus the Second.

STRONGYLUM.

STRONGYLUM is a genus of Submarines, consisting of the same tough and firm matter with the Fucus, but formed into branches and ramifications of a rounded, not of a flat figure. There has not been any part of fructification ever yet observed in any of these plants. They have been used to be confounded with the Fucus, and called Fuci cauliculis teretibus; but this has occasioned great mistakes in some writers, and the repetition of many unnecessary words in others.

1. *Strongylium simplex cavum.*

The simple, hollow Strongylium.

This is a very singular plant: it consists only of a long and slender cylindric body, resembling a packthread. It rises from a small, flat base, and is thinner near the base than in the middle, and grows thinner again as it approaches the other extremity. Its greatest thickness seldom exceeds an eighth of an inch in diameter, but its length is often two or three yards. It is hollow within, and full of sea-water, and there are many membranaceous divisions placed across the cavity, and forming it into a number of cells. Its colour is a dark-brown, its substance that of the tenderer of the Fuci. It is found on our own shores, growing to little stones. C. Bauhine calls it *Alga nigro capillaceo folio*; and Boerhaave, *Filum marinum Germanicum*. Ray calls it *Fucus chordam* *referens, teres, praelongus*; but it is very evident that it has nothing of the structure of the Fucus, nor any thing of the appearance they carry of fructification.

2. *Strongylium ramosum, dichotomum, crassum.*

Thick-branched, dichotomous Strongylium.

This is a very singular little plant. It grows to three or four inches high, and extends its ramifications to as much or more in diameter. It rises from a broad, flat base, affixed to some shell or pebble; from this there grow three or four stalks, round, of a blackish colour, and as thick as a small packthread; each of these soon divides into two parts, and each of those divisions divide, and subdivide again, but always in the dichotomous manner, till of the whole there is formed a thick cluster; the branches grow smaller all the way, and their segments, toward the extremities, are short, and terminate in points: this gives them an odd, forked look. The whole plant is very firm and tough, and is not easily pulled up from its base. It is very frequent about our own shores. J. Bauhine calls it *Fucus marinus forcatellæ lumbricalis species*; and Ray, *Fucus parvus segmentis praelongis, teretibus, acutis*.

3. *Strongylium tenue dichotomum.*

Thin, dichotomous Strongylium.

This is a very elegant little plant. It grows from a small, flat base, fixed to a shell, pebble, or other solid body; from this it usually rises with a single stalk, which is of the

the thickness of a large horse-hair; this is divided into two parts soon after it rises from the base, and each of these are divided again, and their divisions still further divaricated, always in the dichotomous order. The whole plant is of a pale yellow colour, and of a tough texture. It grows to about three inches in height, and, what is singular, its branches are all the way of the same thickness to the top. It is frequent about our own shores: I have met with it abundantly on the Bognor Rocks in Suffex. Plukenet calls it *Fucus trichoides nostras aurei coloris ramulorum apicibus furcatis*.

The other species of *Strongylium* are, 1. The small *Strongylium*, with long, bifid, or trifid extremities. 2. The thick, hairy *Strongylium*. 3. The simple, erect, and short *Strongylium*: This grows to about an inch in height, and is thickest at the base, and smallest at the top. 4. The wind-pipe *Strongylium*; and 5. A large and beautiful *Strongylium*, with very long, bifid extremities. This last grows to two feet, or more, in length, and is of East-Indian origin.

SUBMARINES.

Order the Third. Genus the Third.

ALGA.

ALGA is a genus of Submarines, composed of a tender and herbaceous matter, formed into long, slender, and undivided leaves, resembling those of grass.

1. *Alga longissimo angusto folio.*

The long and narrow-leaved Alga.

This is a very singular plant, and has greatly the appearance of some kind of grass. Its base is a hard, woody, thick, and oblong body, resembling a large root. This creeps along the bottom till it often extends to several yards in length, and is covered, in many places, with a number of filaments, which are the remains of decayed leaves. At different distances there arise from this root clusters of leaves, ten, twenty, or more together; they grow from a kind of bulb, or tuberosity, formed of the rotting bases of other leaves, and extend themselves to four feet, or more, in length, though seldom of more than half an inch in breadth. They are very smooth on the surface, and become gradually smaller from the base to the other extremity, where they terminate in a point. They are sometimes of a dusky-green, which seems their natural colour, sometimes reddish or purplish, and sometimes white. The plant is extremely common on all our shores, and on those of most other parts of Europe. Gerard calls it simply *Alga*; the generality of other authors, *Alga angustifolio vitrariorum*, from the Venetian glass-makers using it to pack up their glasses in. Some have burnt it to ashes for making an alkali-salt for glass-making, but in this it is found to be greatly inferior to many other plants, and is now disused.

2. *Alga brevior folio.*

Shorter-leaved Alga.

This is a much smaller plant than the former. Its base is a tuberos matter, of the length and thickness of a man's finger, fastened to the ground or bottom by many fibres; from this there rise, at the several joints, clusters of leaves of the same grassy form with those of the former, but much broader in proportion to their length: they seldom exceed six inches in length, and are frequently near half an inch broad. They are of a tender and herbaceous texture, and often of a purplish or brownish colour, though their natural one is a dusky green. This species is frequent about the island of Sheppey, and in many other places on our coasts. Ray calls it *Alga graminea minor*.

3. *Alga angustissimo folio.*

The narrowest-leaved Alga.

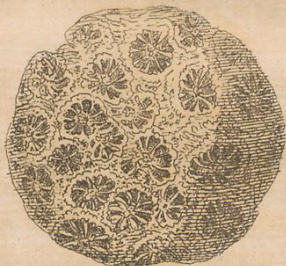
This in its manner of growth, resembles the others, but is evidently a distinct species, as its leaves are longer than those of the first kind, and hardly a quarter of an inch

Submarines

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Mycedium 2.



Asteræa 2.



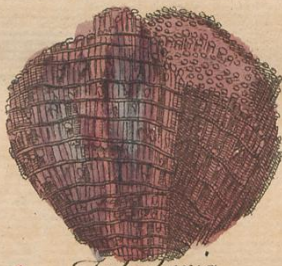
Asteræa 5.



Madrepora 2.



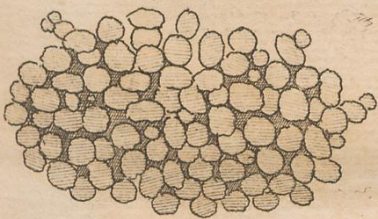
Eschara 3.



Tubularia.



Actabulum.



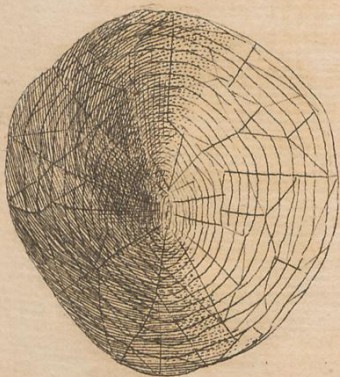
Ormus 1.



Corallum 1.



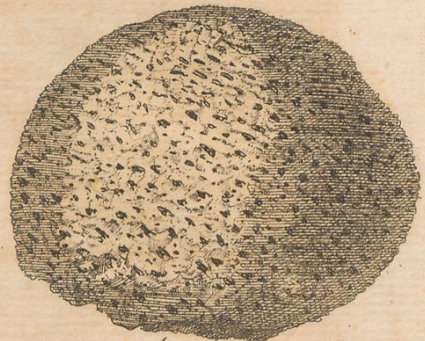
Corallina 1.



Alcyonium 3.



Campyllum 2.



Spongia 1.



Fucus 1.



Strongylium 3.



Alga 1.

B. Cole sculp.

HIS TO BY

PLANT S

ART L

BOOK II



inch in diameter in any part. They float about in the water, and make a very beautiful appearance. Their colour is naturally a pale bluish green, but occasionally it becomes reddish or whitish. Their texture is somewhat more tough than that of the others, and the root slenderer in proportion to its length. This is not a native of England, but it is frequent in the American seas. Sir Hans Sloane has described it under the name of *Alga marina graminea angustissimo folio*.

We meet with accounts in authors of other species of *Alga*, but they seem to be founded upon error. The distinctions of these three are but very slight, but they are certain, regular and permanent, and therefore cannot but be owned as proofs of different species. What we meet with beside these, under the name of different *Algæ*, are either one or other of these in a smaller state, or some other accidental variation, mistaken for different species; or they are plants of other genera, called by this name. Tournefort takes in the smooth *conservæ* of Dillenius into this genus of the *Algæ*, but improperly; and we meet with other instances of a like kind in others.

Ray, in his Synopsis of British plants, gives an account of seed-vessels with perfect seed in them, growing to the sides of young leaves of the *Alga*'s. I have not met with what he describes, and therefore cannot speak with any certainty about it.

PART I.

BOOK II.



H

FUNGI.

THE HISTORY OF PLANTS.

PART I.

BOOK II.

Of FUNGI.

THE Fungi are a class of plants extremely different from all others. They have indeed so little of the common and general appearance of vegetables, that many have denied them to be such, and contended for their being only excrementitious matter, protruded from decaying vegetables of other kinds. A better philosophy has taught the present age, however, to set aside such opinions; and better opportunities of examining the subjects themselves has taught us that the Fungi, though they have neither the colour or texture of other plants, nor leaves, nor flowers like them, yet have absolute and perfect seeds preceded by the essential parts of other more obvious flowers, though without the ornamental ones; and that these seeds will produce plants like those from which they are collected; and finally, that the vascular structure of Fungus's is the same with that of other plants, that their roots are of the same nature with those of other vegetables, and therefore that they are as true plants as any other class of the vegetable tribe, though of a singular figure and construction. The flowers consisting usually each of a single anthera, have been discovered in many species, the seeds in all.

The Fungus's are extremely different in figure, and in their manner and place of growth, as well as in many other circumstances; some of them grow on the ground, some on living trees, and many on decayed wood. Some are but of a few days duration, others remain for years. The general manner of growth of the several kinds naturally leads us to arrange them under the four following classes.

Class the First. Fungi which grow horizontally.

Class the Second. Fungi which grow erect, and have pilei or heads.

Class the Third. Fungi which grow erect, and have no heads.

Class the Fourth. Fungi which grow under the surface of the earth in no particular direction.

F U N G I

Class the First.

Such as grow in an horizontal direction on trees.

Genus the First.

A G A R I C U S.

A G A R I C U S is a genus of Fungus's growing in an horizontal direction on trees, lamellated on its under part, and producing distinct male and female flowers on the same plant.

The male flowers have neither calyx nor corolla, but consist each of a single anthera, affixed to the edge of one of the lamellæ.

Of the female flower no part is visible but the seed, which is small and roundish, and adheres to the sides of the same lamellæ.

It has been a custom to call all Fungi, which grow on trees, Agarics, without enquiring into their particular structure. But the different formation of their under part necessarily arranges the several species of these horizontal Fungi into distinct genera, and the name Agaric is only continued as a generical term to these lamellated ones, as having been applied most frequently to them: this, however, it is to be observed, excludes the Fungus, called Agaric in the shops, from the genus so called, that being porous underneath, and consequently a boletus, though its manner of growth has obtained it, in less inquisitive times, the name of an Agaric. We are not fond of changing officinal names, but must not retain them at the expence of confounding the genera.

1. *Agaricus durior villosus.*

Hard hairy Agaric.

This is a moderately large Agaric, and of an irregularly semicircular form. It grows to the wood on which it is found by a broad base, without any pedicle, and from this extends itself into a figure resembling half, or more than half of a circle, but somewhat too broad for its depth to be regularly of that figure. It is of a tough and firm texture, and is hairy, or rather downy, on its external surface, all that part being covered with a short, thick, and soft fibrous matter. Its principal or ground colour is a pale brown, but it is variegated with circular lines of a great variety of colours, purple, red, brown, and the like. Its under surface is covered with a vast number of extremely thin and fine lamellæ; the flat surfaces of which, especially toward the bottom, are thick, covered with little roundish seeds, and on the edges of which hang rows of little oblong antheræ. This species usually grows single from the body it adheres to, but sometimes it is double, quadruple, or more, fresh plants of it growing from the sides of the old ones. It is very common with us on the stumps of old trees, and sometimes on wrought wood. It is plentiful in a wood beyond Paddington. Dillenius has described it under the name of *Agaricus quercinus lamellatus, coriaceus, villosus*; and Ray under that of *Fungus arboreus holosericeus, inferne lamellatus*.

2. *Agaricus crassus, glaber, margine integerrimo.*

Smooth, thick, even edg'd Agaric.

This is a larger Agaric than the former. It grows to the stumps of trees by a broad base, which conforms itself to their shape, and adheres extremely firmly to them; from this it extends itself into a kind of semicircular form, but irregular, and generally longer than it is broad. It is usually, when full grown, about four or five inches in diameter, and an inch or more in thickness. Its circumference is somewhat undulated, and its colour is grey, sometimes with a tinge of brown, sometimes of bluish with it. Its upper side is perfectly smooth, and its under side covered with fine white lamellæ. These have seeds roundish and very small on them, and oblong antheræ hanging from their edges.

The whole plant is of an ill smell and nauseous taste. It is found with us at the bottom of rotten trees, but not common. J. Bauhine, who found it on old wallnut-trees,

trees, has called it *Fungus auritus juglandium albicans*. I have met with it at the bottom of old beeches, in Charlton forest in Suffex.

3. *Agaricus undulatus glaber.*

Smooth, undulated Agaric.

This is a smaller species than the former. It seldom exceeds two or three inches in diameter, but it is always moderately thick. It grows from a broad and thick base to a semicircular figure. Its surface is perfectly smooth; its fleshy part considerably thick, and its gills large. Its edges are not smooth, as in many of the Agarics, but variously undulated, and as it were curled. Its colour on the upper side is a greyish or bluish, and on the under part white. It is of a softer consistence than many of the other Agarics, and of an agreeable taste and smell, like that of the common esculent mushroom. It is frequent about the roots of trees in Italy, where it is eaten as freely as the common mushroom with us. We have it not in England. Tournefort describes it under the name of *Agaricus præcox albogilvus cristatus*; and Micheli under that of *Agaricum esculentum squammosum glabrum superne, obscurum, inferne albidum lamellatum*.

The other species of Agaric will be easily distinguished by their names; they are, 1. The lobated Agaric. 2. The little, hairy, thin Agaric. 3. The hard Agaric, with reddish lamellæ. 4. The little, yellow, smooth Agaric. 5. The yellow, smooth, large, esculent Agaric. 6. The hair Agaric. 7. The squammos Agaric, with cartilaginous lamellæ. 8. The great bluish squammos Agaric. 9. The hairy, lobated Agaric. 10. The white, smooth, esculent Agaric. 11. The yellow Agaric, with white lamellæ. 12. The brown Agaric, with purple lamellæ. 13. The thick, white, smooth, esculent Agaric. 14. The white, hairy Agaric, with red lamellæ. 15. The undulated hollow Agaric. 16. The reddish, squammos Agaric. 17. The yellow, spoon-like Agaric. 18. The stinking, yellow, fatty Agaric.

F U N G I.

Class the First. Genus the Second.

P O R I A.

PORIA is a genus of Fungus's growing horizontally, but having its underside not formed into lamellæ, but full of little holes or pores; and producing distinct male and female flowers on the same plant. The male flowers have neither calyx, corolla, nor stamina, but consist only of single antheræ of an oblong figure, one or more of which are affixed to the edge of every hole. The female flowers have nothing visible but the seed, which adheres to the inner surface of the tube.

Of the Poriæ, some consist of a simple, uniform substance, the under-part of which is perforated to a greater or less depth, and formed into a kind of tubules.

Others consist of two perfectly different substances. The upper one solid, the under one, which is easily separable from it, formed of a multitude of cylindric tubes applied closely and evenly together, so as to represent an uniform substance, pierced with holes as in the others. The flowers of many of the Poriæ hang so loosely to the mouths of the tubes, that it is scarce possible to avoid shaking them off in gathering the plant; in others they adhere more firmly, and are easily seen. They are in all of an oblong figure, and the seeds, in all that I have yet examined, are oval and small.

1. *Poria crassior foraminibus parvis rotundis.*

The thick Poria, with small, round foramina.

This is one of the simple Poriæ, whose under-part is pierced for the reception of the seeds. It is a very large and thick Fungus. It adheres to the matter it grows on by a broad base, from which it extends itself into an irregularly semicircular figure; usually somewhat longer than broad, and often nearly as thick as it is long; seldom of less than two or three inches in thickness: its breadth is from three or four to ten or twelve inches. It is of a very firm and solid substance; smooth on the upper surface, and

and of a greyish-white colour. It's under surface is at first whitish, but it grows brown in time, and is full of innumerable little holes, on the edges of which hang little oblong antheræ, without pedicles, usually four to every hole; and within each are placed a great number of extremely minute oval seeds, adhering fast to the sides, in several circular series. There frequently grow three or four of these plants over one another, sometimes they stand single. They are common with us on old elms, and other trees, and frequently grow to a vast size. Dillenius calls it *Agaricus porosus igniarius fagi*, *superne albus*, *inferne fuscus*; and Ray, *Fungus pedem equinum referens*. The common people in some parts of England dip it in a solution of salt-petre, and dry it again, after which it is an excellent matter to use instead of tinder, to receive the sparks of fire from a flint and steel.

2. *Poria lata rufescens foraminibus majusculis.*

The broad, reddish Poria, with large holes.

This is a large and very singular species. It usually adheres to the substance it grows on by a thick, but not very broad, base, and from this, after it is extended in length for half an inch or more, so as to make a kind of neck, or pedicle, it extends itself into a semicircular form, sometimes simple, sometimes divided into two lobes. It often grows to six or eight inches in diameter, often is smaller; and it's manner of growing with a neck is not certain, for it sometimes extends at once from a broad base into a semicircular figure. It is considerably thick and fleshy, often an inch or two, or more. It's colour on the upper surface is a dusky, ferrugineous red; when cut into, it is more red, and it's juice is of a blood colour. It is of the number of those *Poriæ* whose under-part easily separates from the upper. It is of a dusky-yellowish colour, and is full of moderately large holes, or, more properly, it is composed of a number of pipes, or tubes, arranged together, whose open end gives this representation; at the mouths of these holes there hang small antheræ, but what number to each cannot be easily determined, because they fall off on the least shaking of the plant. The inside of each tube affords many series of fine, small, oblong seeds.

The plant is of the esculent kind, though not eaten with us. It's smell is agreeable; it's taste that of the common mushroom, but richer. It is found with us sometimes in woods, growing to the trunks of old trees: I have two or three times met with it in Hornsey-wood in January. Dillenius calls it *Agaricus porosus, rubens carnosus hepatis facie*; and Merret, *Fungus hepatis facie, et colore*. It has, indeed, something of the appearance of the liver, and much of it's colour. It grows very common on the chesnut-trees in many parts of Italy, and is sometimes carried to market.

3. *Poria levissima, crassissima, friabilis.*

Light, very thick and friable Poria.

This species is what is called Agarick in the shops. It is of the number of those *Poriæ* which are of a simple substance, and whose inferior part is pierced full of holes. It is extremely irregular in it's manner of growing, and it equals any of the *Agarics* or *Poriæ* in size. It generally adheres to the substance it grows on by a broad and firm base, from which it extends itself to a great breadth and thickness. It's figure is often very irregular, but it usually tends to the semicircular, and is often as thick as it is long or broad. It's colour is grey on the outside, and white as snow within: it's upper surface is smooth, it's lower very irregularly pierced with holes of an oblong and uncertain figure. The flowers we have had no opportunity of seeing, but the Agaric in our druggists shops frequently contains a quantity of seeds, which a microscope easily detects, after laying open the tubular cavities. The whole Fungus is of a very disagreeable smell, and of a very nauseous taste: it is sweetish, when first taken into the mouth, but afterwards acrid, bitter, and loathsome in the highest degree. It is frequent on the larch-trees in many parts of Europe, and is found on several others. We have it not in England: we have, indeed, a *Poria* with all the external appearance of it, but it is not bitter. Most of the botanical and medical writers have described it under the name of Agaric. It was long famous as a purge among the ancients, but, at present, it is quite out of use; it's nauseous taste, and the large quantity of it necessary for a dose, beside it's griping very much in the working, have rendered it not worth notice,

at a time when we have so many gentler and pleasanter medicines that will answer the same purpose.

The species of *Poriæ*, beside these, are considerably numerous, and authors who have written on these subjects have made them appear much more so, by describing the varieties of the several kinds under the names of distinct species: the most singular, beside those here described, are, 1. The great, yellow, naked, or spongy *Poria*. 2. The curled, or endive-like *Poria*. 3. The white, light, thick *Poria*: this is the species which so nearly resembles the *Agaric* of the shops; it is common on willows about Chelsea. 4. The spreading, thin *Poria*: this grows plant by plant, in a circular form, often spreading to a surprising extent. 5. The great, brown, thick *Poria*. 6. The squamated, variegated *Poria*. 7. The hairy *Poria*, with undulated edges. 8. The fan-shaped *Poria*. 9. The woody, yellow *Poria*. 10. The tuberculose and whitish *Poria*. 11. The thick, esculent, white *Poria*. 12. The esculent, cristated, squamose *Poria*, called by the Italians *Grifole*. 13. The yellow-bottomed, brown *Poria*. 14. The white, sulcated *Poria*. 15. The purple, hairy *Poria*. 16. The sinuous *Poria*. 17. The hairy, yellow *Poria*. 18. The reddish, cartilaginous *Poria*. 19. The whitish, thin, hairy *Poria*.

F U N G I.

Class the First. Genus the Third.

O D O N T I A.

ODONTIA is a genus of Fungus's, which grow horizontally, and have their under surface formed into oblong, slender bodies, like teeth; producing male and female flowers in distinct parts of these teeth: the male flowers consist only of antheræ of an oblong figure, affixed to the sides of some of the teeth, and no part of the female flowers are discoverable except the seeds, which are small and oval, and adhere sometimes to the same, and sometimes to different teeth, on the same plants, always to different parts of the surface. The denticuli are of various lengths in the different species, and in the different parts of the same species; and in some they are round, in others flat. Micheli, and some others, have placed among these species some fungus's which have no horizontal top for the teeth to grow from, but consist merely of branched fibres: but these belong to another genus of another order, to be described hereafter.

1. *Odontia villosa denticulis planis.*

The hairy Odontia, with flat teeth.

This is a very elegant species, and shews the denticulation extremely plainly and distinctly. It rises from an extremely broad base, affixed to some old tree, and has there it's greatest diameter. It does not extend into breadth, after it grows from the base, but is continued from it in a semicircular form, it's diameter decreasing all the way to the extremity. There generally grow three or four plants of it near one another, often more. It's size is two or three inches in breadth at the base, and a little less than that in length. It's upper surface is whitish and hairy, and usually rises into protuberances in some places. It's under surface is formed into a vast number of oblong, flat teeth, considerably large, and standing in several rows, one behind another. On the surfaces of these there may be sometimes seen antheræ, placed in rows, and often small seeds, of an oval figure, irregularly scattered about them. It grows in many parts of Yorkshire and Leicestershire, on old oaks and elms that stand much exposed. Micheli describes it under the name of *Agaricum squammosum album, superne villosum, inferne denticulis longioribus præditum*.

2. *Odontia glabra denticulis latis.*

The smooth Odontia, with broad teeth.

This is a very beautiful Fungus. It grows by a long and continuous base to some old wood, extending itself, not into a semicircular figure, as most of the others do, but running

running on in length in a surprising manner, and forming a vast flat mass, with undulated edges. It will extend in this manner to three or four feet in length, but seldom stands out further than to two or three inches from the surface: it is seldom above a quarter of an inch thick, often thinner, and sometimes fixes it's back, or, properly, it's upper part, to the wood on which it's base is fixed, so as to form only a kind of crust to it. When loose and free, it's surface is found to be smooth, it's colour a dusky brown, and it's smell and taste very disagreeable. It is very tough and firm, and is, in it's lower part, formed into a vast number of teeth, of an inch long, and of the breadth of a wheat-straw, or more. There are several series of these, standing behind one another, all entire and separate; they are of the same tough structure with the rest of the Fungus, but of a pale rose colour in the middle, and of a beautiful deep-blue at the edges. In February several of the longest of them are covered with a sort of brownish powder, which, when examined, is found to be composed of clusters of the male flowers, or antheræ, each of an oblong figure, and each placed separately on the tooth, no sets of them near one another, but all regularly arranged into one congeries, as if they constituted together only one flower. The seeds are very small, and may be seen on the surface of the shorter teeth with the help of a good microscope, almost through the whole summer. Mr Sherard first discovered this beautiful plant growing to the beams of a cellar in Wimbleton: it has since been found in many such places. It is described in the last edition of Ray's Synopsis under the name of *Agaricus coriaceus longissimus, pectinatum inferne divisus*.

3. *Odontia rotundior denticulis subulatis.*

The rounder Odontia, with subulated teeth.

This is a small species of *Odontia*; it rarely exceeds the breadth of a half-crown, and hardly equals it in thickness. It grows to the stumps of old trees by a firm base, thick, and not very broad; from this it extends itself into a semicircular figure, often into a much larger part of a complete circle. Several plants of it usually grow over one another at a small distance, and often the branches of a decaying tree are quite surrounded with them; they sometimes stand so close as to injure one another's figure, and sometimes this occasions them to grow very irregularly. Their upper surface is hairy, or downy, and of a brownish grey; their under part is paler, and is formed into a multitude of short teeth: they indeed deserve the name of teeth better than those of any other species, for they are more of their shape, and, indeed, much resemble the short and sharp teeth of some quadrupeds: they are about a fifth of an inch long, and are not flatted, but of a rounded figure, thickest at the base, and, growing gradually smaller to the other extremity, they there terminate in a sharp point. The whole plant has a disagreeable smell, and a nauseous taste. The teeth are often found dusty with the farina in spring; and in summer the seeds may be discovered on the sides of them.

This species is common in our woods, on the branches of old trees, and sometimes on rotten wood that has been wrought. Micheli calls it *Agaricum squammosum album, superne subhirsutum, inferne pectinatum*. The other species of *Odontia* are, 1. The broad *Odontia*, with a short pedicle at the side. 2. The coriaceous *Odontia*, with white teeth. 3. The purple-teethed *Odontia*. 4. The thin, ground *Odontia*, with long cylindric teeth.

F U N G I.

Class the First. Genus the Third.

A M P H I T R E T I A.

AMPHITRETIA is a genus of Fungus, growing horizontally, or irregularly, and consisting of a light, spongy matter, on every surface of which there are foramina: on the edges of these grow male flowers, consisting only of oblong, single antheræ, and within them are lodged very small, oval seeds.

1. *Amphitretia crassior undulata.*

The thick, undulated Amphitretia.

This is a large, but shapeless Fungus. It grows by a great base to the bottom of old trees, from which it extends itself every way, often very irregularly, sometimes in a kind of semi-

femicircular form. It grows to four or five inches in breadth, and sometimes to two or three in thickness; its surface is not regular, but often protuberates in several places. Its edges are thinner than the rest, and usually turn up a little. Its whole substance is light and spongy; its colour white: it, in the whole, much resembles the crumb of new bread, but that its pores are not so large. It is porous on every part, the upper surface as well as the under being pierced with innumerable little holes, on the edges of which may be sometimes seen a single anthera, and within are usually found several seeds, extremely small and light.

This species is frequent in Charlton-forest in Suffex, in August and September, about the stumps of beech-trees; it sometimes grows from the wood, sometimes from the ground. Micheli has called it *Agaricum album terrestre medullam panis referens*: he had probably only found it growing on the ground.

2. *Amphitretia tenuior durior.*

Thin and somewhat hard Amphitretia.

This is an extremely singular species in its manner of growth. It always grows to the lower parts of the stalks of plants: it affixes itself to these by a broad flat base, and from this extends itself, not into a semicircular form, but every way round the stalk, and afterwards spreads in the same manner both lower and higher, till it forms, at length, a kind of fungous coat round the whole stalk for two or three inches: a part of this sometimes penetrates a little way into the ground, but more usually the whole is, from the surface, to two or three inches high. It is of a black colour, and very spongy substance, but its utmost thickness, which is usually in the lower part, does not usually exceed a third of an inch; sometimes, indeed, it grows considerably thicker. Its whole external surface, and its internal surface also, where it does not adhere to the stalk of the plant, are covered with little holes of an irregular figure, on which there may be sometimes seen single antheræ at the edges, and almost always seeds may be found within, on a nice examination. Its whole substance is spongy, but somewhat harder than the former; its smell and taste very disagreeable. It is not uncommon with us in December and January, about the lower parts of the stalks of such plants as are up at that time, especially in damp woods. Micheli describes it under the name of *Agaricum spongiosum nigrum, imæ plantarum caulis parti adnascens*.

3. *Amphitretia foraminibus maximis.*

Amphitretia with very large holes.

This species grows to the lower parts of the stalks of plants, in the same manner as the former; but it differs greatly from it in its manner of growth from the base, and in its general structure. It is a small fungus, rarely exceeding half an inch in diameter, and with that usually having a quarter of an inch in thickness. It grows from a moderately large base into an oblong and irregular form, not surrounding the stalk of the plant, but standing out horizontally from it. Sometimes only a single plant is found, sometimes several together. Its colour is a dusky-white, its substance very spongy, and its upper, as well as its under, surface pierced full of large holes, which penetrate deep into it, and are not round, but flattish, and very irregular. The antheræ, or male flowers, of this I have not been able to discover: the seeds are easily seen in it; they lie in round series on the inside the tubes or holes. It is common about the stalks of plants in many of our woods; it grows near the ground, and is generally buried under the dead leaves which cover the earth in those places. Micheli calls it *Agaricum album spongiosum, brunellæ plerumque adnascens*: he found it at the base of that plant in July in Italy. I have often met with it in January and February in Cane-wood, about the roots of several different plants, under the dead leaves.

4. *Amphitretia tenuis succulenta.*

The thin, succulent Amphitretia.

This is by much the most beautiful of all this genus. It grows to the base or bottom of the stems of little shrubs, and is of a beautiful violet colour. It adheres by a broad base, from which it extends itself into an irregularly semicircular form. Its edges are undulated, and often turned up, and its whole surface uneven. It grows to the size of

of an inch in diameter, but is seldom thicker than a half-crown piece. It is spongy and succulent, easily compressed, and readily parting with a viscous whitish juice. Both its upper and lower surface are pierced full of small irregular holes, on the surfaces of which hang single, oblong antheræ, and within their cavities there are multitudes of small seeds.

These are all the species of *Amphitretea* hitherto known: Micheli has the honour of having discovered the three first; the last I met with this autumn in Richmond-gardens, at the roots of some of the flowering shrubs in the new walks.

F U N G I.

Class the First. Genus the Fourth.

SCINDALMA.

SCINDALMA is a genus of Fungus's, growing horizontally on the barks of trees, and composed of a great number of plates, or flakes, covering one another, all of a semicircular form, and each composed of a multitude of tubules, or short pipes, arranged close together, and adhering firmly to one another by means of an intermediate fungous matter.

1. *Scindalma laminis tenuioribus.*

The thinner-flaked Scindalma.

This is a very large Fungus, and is usually of a semioval or semiorbicular figure. It grows to the barks of old trees, and appears no other than a solid mass of this figure, affixed by its whole base to the bark, and perforated all over its surface with very small holes. When taken off and examined, it is, however, found of a very singular and very regular structure. Its colour is a brownish-grey, its substance considerably hard, and it is much heavier than most of the Fungi; when cut open, it is found to be composed of eight, ten, or more laminæ, laid regularly and evenly over one another, and each of the same regular structure. They are each of the thickness of the tenth of an inch, or thereabout, and of a white colour, and tolerably firm texture, though full of holes: held up against the light, each appears like a fine sieve, and, when accurately examined, each is found to have a vast number of holes bored in both surfaces. The whole Fungus grows to five or six inches in breadth, and half as much in thickness. It endures the whole year, indeed many years, but September is the only time in which it is to be found in flower. At this time a light dusty matter may be seen on its surface, which is the antheræ; and, on cutting it transversely open, the upper surface of every one of the laminæ will be found to be covered with the same powder; when examined with a microscope, this powder is found to be composed of oblong granules, one standing on the surface of each aperture or hole; the under surface of the laminæ, though equally porous, never has a single anthera adhering to it: in the cavity of the tubules is found a fine powder, consisting of oval globules, adhering to the inner surface of the tubes, principally in the lower part: this is the seed. I never saw this species except once in a wood near the late Lord Petre's, who with great pleasure observed its structure and fructification with me. It grows to the old trees in that wood in several places. Micheli calls it *Agaricum durum, crassum, assulatum, ilicibus adnascens, griseum*; but its colour with us is rather a pale whitish-brown than grey.

2. *Scindalma laminis crassioribus.*

Thick-flaked Scindalma.

This is a large and coarse Fungus, but of a beautiful white colour. It grows to the bigness of a man's head, and is usually of the figure of half a sphere. It is extremely hard and firm to the touch, and scarce shews any appearance of pores on the surface; when cut open, it is found to be composed of four or five very thick hollow coats, laid closely upon one another. Each of these is pierced with innumerable holes on the upper and under surface, but it is easy to see that these holes do not communicate with one another, but that each of these coats is composed of two series of tubes, meeting, but

not open at their bases. These coats are all of the same pure white colour with the external one, and their perforations are so regular, that they make a very beautiful appearance in autumn. On cutting into this species, there will be found antheræ on both the surfaces of every coat; and, in winter, seeds are found in great numbers in every pore or tubule, adhering to the sides in form of a fine powder.

I have only met with this species in one place, which is the wood above mount Sorrel in Leicestershire. There it grows to the old trees of all kinds in considerable plenty. These are all the known species of this very singular genus of Fungus.

F U N G I.

Class the First. Genus the Fifth.

S T E R E U M.

ST E R E U M is a genus of Fungus's, of a solid and uniform structure, neither divided into lamellæ, nor pierced with holes, either externally or internally, but whose upper and under surfaces are the same, and both apparently smooth and uniform. The fructifications of these Fungus's are produced on the surface, and consist of antheræ and seeds.

1. *Stereum tenuius villosum.*

Thin, hairy Stereum.

This is a small but a very beautiful Fungus. It grows to old trees by a broad base, and usually a cluster of the plants grow together. It creeps lengthwise to three or four inches, often more, and sends out from space to space semicircular bodies, of an inch or more in diameter. These sometimes grow single, each from its own distinct base; but more frequently the base is continuous, and extends itself in length, as just observed. The colour is very beautiful, often a deep purple, sometimes a paler, and sometimes yellow. The colour, be it what it will, is always palest about the base of the Fungus, and deeper at the edges, and is usually stronger and deeper on the under side, than on any part of the upper. The base is often whitish; and the whole upper surface in this case is usually variegated, either with purple and white, or with yellow and white. The Fungus is not in any place so thick as a half-crown, in most not so thick as a shilling. It has no pores nor lamellæ on any part, but both its upper and under surfaces are in February and March covered with a mixt powder, part consisting of oblong, and part of roundish granules, which are apparently the first the antheræ, the latter the seed. The upper surface is covered with a soft kind of down, which retains these granules of both kinds, much longer than they are found on the other.

This species is frequent on old trees about Chelsea. Dillenius calls it *Agaricus villosus tenuis*, *inferne lævis*. Ray, *Fungus arboreus villosus*, *inferne planus*; and Micheli, *Agaricum Alpinum squammosum membranaceum, superne obscurum & fericeum, inferne rufescens*.

2. *Stereum crassius læve oblongum.*

The thick, smooth, oblong Stereum.

This is one of the most elegant of all the Fungus kind. It rises from a base equal to any part of it in breadth, and usually of a somewhat greater thickness. From this it grows in an horizontal direction, to the length of three, four, or five inches or more. Its breadth is three or four inches, nearly as much as its length, and its thickness about a quarter of an inch or more; in all this, however, it varies extremely; it is sometimes much narrower, and much thinner, and sometimes it is almost as thick as broad. It never, however, assumes a semicircular figure, and its most perfect one seems oblong, broad, and flat. It is perfectly smooth both on the upper and under surfaces, and is of an elegant bright red colour, variegated in a very beautiful manner with black and yellow; these colours are disposed in veins and spots in a beautiful manner, and the whole surface is smooth and glossy. It sometimes grows single, but

but more usually ten or twenty plants of it grow in a cluster, in which case it is very conspicuous.

There is not the smallest pore visible in any part of it; yet at a certain season every year, which is about August, the whole plant is covered with a fine powder, which is evidently composed of two kinds of granules, oblong and round ones: the former are the farina, the latter the seeds.

It grows to the rotten stumps of trees, and to rotten wood of any kind, but it is not very common. I once found above forty plants of it on an old gate-post near Paddington, and have two or three times seen it about the stumps of trees in Charlton forest. Ray calls it, *Agaricus digitatus maximus ex luteo, coccineo, & nigro eleganter variegatus*. Merret, *Fungus corallii rubri colore, multis lineis nigricantibus & maculis luteis insignitus*.

3. *Stereum crassissimum durum.*

Hard and very thick Stereum.

This is a very large Fungus, but has little else remarkable about it. It grows to old trees by a broad and extremely firm base, which often is so well fixed, that a part of the wood is easier pulled away with it, than it is separated. From this base it extends itself irregularly into somewhat of a circular, or partly circular form. We often see it making nearly a whole round, its base appearing like a kind of very thick and very short pedicle at its side; often it grows only semicircular, its base extending so far, as to make the broadest part of it. Its diameter is often eight or ten inches, sometimes more; its thickness is from two to four or six inches. It is extremely hard and solid, and remains many years; but, when very old, it sometimes cracks on the surface. Its colour is white, sometimes very pure and clear, sometimes brownish or greyish. Its substance is almost woody, its surface smooth and uniform, with no marks of lamellæ or pores on it. Toward autumn, however, it is found dusty in several parts, and this dusty matter, when examined, is found to be partly the antheræ, partly the seeds, as in the others of this genus. This kind of dust wipes off very easily from them all. This species is very common on old elms and other trees about London. J. Bauhine calls it, *Fungus densus ad ellychnia*; and others, *Fungus ignarius*.

The other species of the Stereum are, 1. The gelatinous, membranous, and sinuated Stereum. 2. The lichen-like villose Stereum. 3. The little white, trilobate Stereum. 4. The little red lobated Stereum. 5. The thick brown Stereum, growing in the fissures of old wood, and called oak leather. 6. The tufted, hollowed, thin Stereum. 7. The blue, lichen-like Stereum. 8. The reddish, thicker lichen-like Stereum. 9. The white, very thin, and dry lichen-like Stereum. 10. The brown, dichotomous, wood Stereum. 11. The yellow, fibrose Stereum. 12. The black, reticulated Stereum. 13. The white, hairy, reticulated Stereum. 14. The fine velvety, greenish Stereum.

F U N G I.

Class the Second.

Such as grow erect, and consist of pedicles crowned with Heads.

Genus the First.

LEPIOTA.

L EPIOTA is a genus of Fungus's, consisting of a pedicle supporting at its top a head, the under part of which is divided into innumerable thin and fine lamellæ. The Lepiotæ are the most common of all the species of Fungi. They have with us acquired the name of mushroom, in preference to all the others, and Micheli, who has given peculiar names to the rest, calls these Fungi, as if that name belonged peculiarly to them. The common esculent mushroom is of this kind, and there are almost innumerable others, which approach to it in figure and structure, though they want its pleasant flavour, all which are of this genus.

The

The fructification of the Lepiotæ is this: they produce male and female flowers on distinct parts of the same plant. The male flowers have no cup or corolla, but consist of a very short stamen, to which is affixed in some species a single anthera, in others four or more. The female flower we can distinguish no part of but the seed. This is extremely minute and round, and in some species stands single, in others in clusters of four or more together. The antheræ are affixed to the edges of the lamellæ; the seeds to both sides of them. Where the male flower consists of a single anthera, the seeds stand single; where there are four antheræ affixed to the same stamen, as is usually the case in the others, the seeds stand in little clusters, four together. If these fructifications of the Lepiotæ were larger and more visible, we should make two, or perhaps more genera, instead of one of them: but where the fructification is so minute, as not to be distinguishable without the help of powerful microscopes, we are not to pay so much regard to it in a work of this nature, where the obvious characters are the proper ones for establishing generical distinctions on.

The lamellæ, in some of these Fungus's, stand very close, in others farther asunder; and in some, where a larger distance is necessary for the ripening of the seeds, the lamellæ have little protuberances of a conic figure growing on their sides, which prevent their touching one another, while the seed is ripening, and which wither, as soon as it is fallen. We have called this genus Lepiota, from the Greek *λεπίς* a lamella. Some of the Lepiotæ grow single, one stalk only arising from the root; others have several pedicles arising from the same root; and of both these kinds some are simple, each stalk or pedicle running up single, and producing only one head; others are ramose, each pedicle dividing into several stalks, and each stalk having it's peculiar head.

Many of the Lepiotæ have an annular membrane growing from the upper part of the stalk, and joining the edges of the head, while small; this is separated from the head, or else from the stalk, by the expanding of the head. In some species it remains on the stalk, in others it hangs to the edges of the head; but in most it is very tender, and falls soon to pieces, though in others it remains as long as any part of the Fungus.

In some species of the Lepiotæ, the seeds falling from the heads immediately shoot, and produce other perfect Fungus's like the parent; in others they first produce only roots, which grow and spread themselves under the ground to a great extent, and after a year or two shoot up pedicles in abundance, with heads to them. Finally, others shoot at their first falling into perfect Fungi of the same kind, formed in miniature, in a kind of cases or involucra, by the bursting of which afterwards they are allowed to grow up: in some of these species the involucrem perishes, as soon as the plant grows up from it; in others it remains, and grows up with it: in some it remains affixed to the root, in others it's parts are seen on the very summit of the head.

Obvious and distinct as these several characters appear to be, however, they are not to be expected with any degree of certainty: there are no plants which vary so much in their manner of growth as the Lepiotæ. The branched kinds are sometimes found simple, the simple ones sometimes branched, and the annular appendages of the stalk, as well as the remains of the involucra, are sometimes found permanent, sometimes not, on the several individuals of the same species.

The seeds of many of the common Lepiotæ, properly sowed, will produce under the eye their proper species. The first appearance of these is usually the involucrem, containing the plant in miniature, from which it afterwards grows up in its proper form.

1. *Lepiota simplex crassius pediculo longiore.*
The single, thick Lepiota, with an oblong pedicle.

This is a moderately large species. It's root is somewhat tuberous; it's stalk round, and of the thickness of a child's finger. It's head obtusely conic, and of a dull brownish colour. It grows to about four inches in height, and it's head is near two inches in diameter at the base. The lamellæ are of a pale brown. The whole plant is succulent and of a good smell, and is worthy to be received at our tables, though at present not regarded; the stalk is hollow, and there is no annular rim on it. The flowers in this species are single, and the seeds in like manner stand single on the lamellæ. It is common in dry pastures in many parts of England. Ray has described it

it under the name of Fungus esculentus pileo & lamellis albis, but they are not properly white; he only seems to have meant to distinguish it from the common redgilled kind.

2. *Lepiota simplex lævis pediculo crasso bulboso.*
The smooth Lepiota with a thick, bulbous pedicle.

This is a large and beautiful Fungus. It grows to about four inches in height, and its head is more than half an inch in diameter. The bottom of the pedicle is a bulb of an irregularly roundish shape, and of the bigness of a large walnut; from this the pedicle continues of the thickness of a man's finger, and the head is obtusely conic. The pedicle is whitish; the outside of the head of a pale brown, and glossy, and the lamellæ white; the head is thick and fleshy, but of an ill smell. The flowers in this species stand single, and the seeds also are disposed singly on the lamellæ. There is no annular membrane on the stalk. It is common on many of our heaths, among the fern and furz-bushes; Putney heath produces a great quantity of it. C. Bauhine and Ray describe it under the name of Fungus pediculo in bulbi formam excrecente.

3. *Lepiota annulata simplex squammata.*
The scaly, annulated, simple Lepiota.

This is also a large Fungus. It grows to four or five inches in height, and its head is three or four inches in diameter. Its pedicle is somewhat thick at the base, and from thence rises of the thickness of a man's finger. It is not smooth, but squammated as it were with the remains of external membranes decayed; near the top it has a beautiful annular membrane, of a tough texture, and usually somewhat erect, sometimes horizontal, sometimes dependent. The head is broad and almost flat, rather rounder in its manner of rising than conic. Its edges turn in, and its external surface is cracked and squammated, as the pedicle, with the remains of some other membranes. The whole plant is of a somewhat deep, but not unpleasant, brown colour, except the lamellæ, which are sometimes whitish, sometimes of a pale red.

It is frequent with us in woods and on heaths. Hampstead heath and Cane wood abound with it. Fabius Columna calls it, Fungus dipsacoides quercinus; and C. Bauhine, Fungus bulbosus fuscus duplici pileolo.

4. *Lepiota ramosa, glutinosa, flava.*
The yellow, glutinous, ramose Lepiota.

This is a very singular and very elegant species; it rises from a thick tuberous root, and that usually with three or four stalks. Each of these is soon after divided into two or three more, and these sometimes send out lateral ramifications, so that it is not uncommon to see ten or twelve branches from one root. Each of these has its head of a circular figure very little elevated at the summit, and often hollowed. The stalks are about a third of an inch in diameter, and the heads an inch and half broad. The stalks are of a pale whitish colour, the heads of a deep yellow, and covered with a glossy, glutinous matter; the lamellæ are white. The whole plant has a strong and disagreeable smell. The antheræ in this species stand four on each stamen, and the seeds are accordingly arranged in little clusters, four together. It is common at the stumps of old trees in autumn: there is also a simple Fungus of this genus which resembles it in colour, which grows in the same places, and, till taken up, is easily mistaken for it. This is found very plentifully in Hornsey wood, and about Highgate and Hampstead.

These four species may serve to give a general idea of the different appearances of the Lepiotæ. The other species are extremely numerous; the principal of them will, however, be easily understood by their names. They are, 1. The common esculent Lepiota. 2. The great, green, rough Lepiota. 3. The flat-headed, yellow Lepiota. 4. The pale, yellow, contorted, esculent Lepiota, called the chanterella. 5. The funnel-headed, great Lepiota. 6. The great, red Lepiota. 7. The round purple-headed Lepiota. 8. The long-stalked, annulated Lepiota. 9. The great flat-headed Lepiota, with a bulbous, violet-coloured pedicle. 10. The broad,

white-headed Lepiota, with an acrid, milky juice. 11. The broad, white-headed, milky, but mild Lepiota. 12. The great, red-headed, short-stalked Lepiota. 13. The great long-stalked Lepiota, with turning up edges and white lamellæ. 14. The deep, yellow, conic-headed Lepiota. 15. The mouse-coloured Lepiota, with white lamellæ. 16. The oval-headed Lepiota. 17. The great white varying tree Lepiota. 18. The purple-rimmed, livid Lepiota. 19. The white, dusty-headed Lepiota. 20. The mucous, greenish-headed Lepiota. 21. The white, viscid Lepiota. 22. The little purple, hæmorrhoidal Lepiota. 23. The little flat Lepiota. 24. The hollow and striated-stalked Lepiota. 25. The thin-stalked Lepiota, with few lamellæ. 26. The purple-stalked, yellow-headed Lepiota. 27. The long-stalked, milky and acrid Lepiota. 28. The bulbous, brown, acrid, lactescent Lepiota. 29. The yellowish, acrid, and lactescent Lepiota. 30. The tough, purplish, acrid, lactescent Lepiota. 31. The blackish dung Lepiota, with the head striated externally. 32. The little purple dung Lepiota, with the head striated on the upper part. 33. The branched silvery Lepiota. 34. The great perennial-rooted Lepiota. Beside these, there are a multitude of other species of all the principal kinds, differing in colour and other circumstances. I have figured and described in MS. of these and the other genera of Fungi more than eight hundred, but to give them here would make this volume, not a history of plants, but a history of mushrooms.

F U N G I.

Class the Second. Genus the Second.

SOLENIA.

SOLENIA is a genus of Fungus's, consisting of a pedicle and a head. The head consists of two parts; the upper one of a fungous texture, the under one tubular. The under part is easily separable from the upper, and is composed of a great number of short and slender tubes, joined side by side to one another. These tubes are of a cylindric figure, and open at the mouth or under extremity.

The Solenizæ produce male and female fructifications in separate parts of the same tubes. The male flowers have neither calyx nor corolla, they consist only of stamina and antheræ: the stamina are very short, the antheræ oblong and large; they grow to the verge of the tubules, four, six, or more in number to each tubule. The female flowers we see nothing of, except the seeds; these are very small and roundish, and are disposed in series along the inside of the tubes.

The heads of the Solenizæ are in general less elevated than those of the former genus. They rather resemble segments of spheres than cones.

1. *Solenia pediculo bulboso.*

The bulbous-stalked Solenia.

This is a very singular Fungus; it grows to four or five inches high, and its pedicle is more than three inches in diameter. It is of a dusky yellow on the upper part of the head, and of a clearer but somewhat greenish yellow underneath: the stalk is of the same colour with the external surface of the head. It is bulbous, and as big as a large walnut at the bottom; from this it rises of the thickness of a man's finger to the head: the head is thick and fleshy, and of a good smell and taste. Its under part is composed of extremely narrow tubules, so that its surface appears pierced with innumerable small holes. When it has just arrived at its full size, the male flowers may be seen at the extremities of these holes; and, so far as I am able to determine from two or three examinations, six of them seem to adhere to every tubule: the seeds are extremely minute, and difficultly discernible. This species grows with us in woods pretty frequently. Ray describes it under the name of Fungus porosus crassus. He says, it is abundantly distinguished from all the other Fungus's by its head being porous, not lamellated underneath. It is probable that Mr. Ray, at the time when he

he wrote this, did not know any other species of the porous kind; but it is somewhat odd, that Dillenius, who adds many other species of them in the third edition of the Synopsis, should let such a remark stand.]

2. *Solenia pediculo crasso, punctato, brevi.*

The Solenia, with a short, thick, punctated stalk.

This species does not grow to more than three inches in height, and it's head is fully as much in diameter. The stalk is as thick as a man's thumb, and about as long. The general colour of it is a brownish yellow, but it is elegantly spotted with small dots of purple; it is fleshy, succulent, and of a good smell. The head is nearly flat, semicircular, and undulated at the edges; it is of an orange colour on the upper side, and of a pale yellow underneath, where it is perforated with very large holes, at the extremities of each of which stand four antheræ. Within the tubes the seeds are easily distinguishable, being considerably large for those of a Fungus, and of a globular figure. The plant grows with us in woods, but it is not common. I have met with it once or twice in Cane wood by Hampstead. Dillenius calls it, *Boletus luteus*. Micheli, *Suillus esculentus magnus, crassus, pileolo supine fulvo, prone luteo pediculo crassiore concolore punctis et lituris rubris notato*. This author calls all the *Soleniæ* *Suilli*, because of the hogs being fond of eating them.

3. *Solenia pediculo ventricoso.*

The hollow and protuberant-stalked Solenia.

This is a very singular Fungus. It grows to five inches in height, and it's head is of about two inches in diameter. It's stalk, which is the singular thing belonging to it, is at the surface about a sixth of an inch in diameter, and hollow. From this part it goes downward two inches or more into the earth, tapering all the way till it terminate in a point; and, as it rises upwards, it swells, till at about the middle of it's height it forms a hollow part of an inch in diameter, and of an inch and half in length; this is of the greatest thickness in the middle, and from it's upper end continues of the size of one's little finger to the head. The head itself is more elevated than in many other species of this genus, but it does not run up into a cone, but rather forms a segment of a circle. It is of a dusky orange colour on the upper part, and of a brighter yellow underneath. The tubes it is there formed of are moderately large, and at their openings there stand six antheræ to each. The seeds are large for those of a Fungus: a very moderate magnifier will shew them in the tubes. The stalk is of a brownish yellow, and is all the way hollow. This species is frequent in Charlton forest in Suffex. Micheli calls it, *Suillus perniciosus, superne obscurus, inferne ochroleucus pediculo ventricoso, superne pileoli parti concolori radice in mucronem longum producto*.

The other known species of *Soleniæ* are but eight, and will easily be distinguished by their names. They are, 1. The thick, whitish *Solenia*. 2. The smaller, red and yellow *Solenia*. 3. The brown-headed *Solenia*, with the under part white. 4. The purple-headed *Solenia*, with a cream-coloured under side. 5. The hairy, yellowish *Solenia*. 6. The great viscid, yellowish *Solenia*. 7. The long-stalked *Solenia*, with a yellowish, red head, white underneath; and 8. The short and slender-stalked *Solenia*, with a broad reddish head.

F U N G I.

F U N G I.

Class the Second. Genus the Third.

P O R I U M.

PORIUM is a genus of Fungi consisting of a pedicle and a head; the head of which has it's proper substance, in the under part, pierced with a great number of holes of various shapes and dimensions in the several species, and producing distinct male and female flowers. The male flowers have neither calyx nor corolla, but consist only of antheræ, affixed to very short stamina, and placed round the edges of the holes. The female flowers are placed within the holes: we see nothing of them but the seeds, which are round, very minute, and placed singly on the inner surface of the cavities.

The Poria and soleniæ both exhibit the same appearance of perforations on the under part of the head, but, in the soleniæ, what we see, as perforations, are the mouths of a multitude of tubes, which conjunctly form a body, easily separable from the substance of the head; whereas, in the Poria, they are mere holes made in the substance of the head itself, and, therefore, are inseparable from the rest of it. The holes in the others are generally much deeper than in these.

1. *Porium poris minoribus capitulo plano.*

The flat-headed Porium with small pores.

This is a Fungus of no great beauty, but singular enough in it's manner of growth. It's pedicle is not more than an inch and an half in length, it's head near three inches over. The pedicle is smallest at bottom, and gradually grows larger upwards. It is of a soft, spongy structure, and yellowish-brown colour. The head is flat, and undulated at the edges, irregularly protuberant on the surface, and rather depressed than elevated, where the pedicle is inserted. It is of a yellowish-brown colour on the upper part, and of a greenish-yellow on the under, where it is pierced very thick with small and shallow holes. The whole Fungus is fleshy and succulent, but of an ill smell. It's flowers stand four at the mouth of every hole; it's seeds are moderately large for those of a plant of this kind, and very numerous, covering the whole inner surface and base of the holes, and giving the whole a granulated appearance. It is common in some parts of England. It grows usually to the stumps of trees in damp places. C. Bauhine has described it under the name of Fungus angulosus pediculo exiguo; and Sterbeck, under that of Auricula flammea malchi.

2. *Porium pilosum cavitatibus maximis.*

The hairy Porium with very large cavities.

This is an extremely singular and beautiful species. It seldom grows to more than an inch and an half in height, and it's head is about half an inch in diameter. It's pedicle is about an eighth of an inch in diameter, a little larger at the base than any-where else, and of a brownish colour. The head is pretty much elevated, but rather semicircular than conic in it's figure. It is moderately fleshy; in colour, of a ferrugineous brown, and hairy at the edges. It's under part is formed into very large, shallow cavities, of an angular form, and has something of the resemblance of a honey-comb in miniature, and is of a white colour. The whole plant has a strong and disagreeable smell. It is frequent, in the forest of Dean in Gloucestershire, on the branches of old elms and other trees. Micheli has distinguished it by the name of Polyporus exiguus, subtus rhomboideis foraminibus fenestratus.

3. *Porium radice ingenti perenni.*

The great perennial-rooted Porium.

This is, perhaps, the most singular of all the Fungus class, and has led as many people into errors as any thing of the vegetable kind.

It's

Its root is of a spongy, fungous texture; and increases in an inconceivable manner in a very little time, and, as it grows in size, it surrounds and incorporates into its body stones, sticks, or any other substances which happen to be in the way. It is not uncommon to see a root of it, of this implicated kind, of two or three feet in diameter; and, with the stones it contains, or, at least, connects together, weighing a hundred pounds, or more: its own matter, however, makes but a small part of this bulk or weight; the smaller stones, indeed, it surrounds sometimes, and buries in its substance; but the larger are seldom covered intirely with it, usually only connected one to another by it. From the various parts of this root, that is, from the surfaces of these stones, where covered with it, and from the crevices between the several stones, filled up with it, grows the Fungus itself: this first appears in form of an oblong conic body, two or three inches in length, and of about a third of an inch, or more, in diameter at the base. It continues in this state some time, when it begins, by degrees, to grow tumid at the summit, and, by degrees, expands into a complete and perfect head, like that of the first described Porium. The pedicle, upon the whole, is about three inches long, and, by that time the head is fully grown, is larger at the top than at the base, contrary to what it originally was: It is succulent and white. The head itself is about an inch and half in diameter, not elevated, but flat, or somewhat depressed at the insertion of the pedicle. It is tolerably thick, and of a ferrugineous colour at the top, and white, and full of small pores, underneath. The whole plant is of a good smell, and may be eaten with safety.

It is frequent in Spain, Italy, and Sicily, but we have it not in England. C. Bauhine calls it Fungus in saxi proveniens; J. Bauhine, Fungus supra lapides; and Cæsarpinus, Fungus in lapide fungoso. The Italians call it Fungo della pietra fungaja. Not only the botanists, but the fossilists, in general have claimed its root to their share; they have taken it to be a very stone, and there is scarce a book on that subject, except our own, in which it is not described as a mineral, under the name of Lapis fungifer. They have supposed the whole congeries about the root of this plant a mass of natural stone, and have celebrated it as a peculiar species of fossil, which had the singular property of producing mushrooms, which they assure us it will at any time do on being watered, or laid in a damp place.

The other species of Porium will easily be distinguished by their names: they are, 1. The small, white, coriaceous Porium. 2. The grey, lacerated-headed Porium. 3. The small Porium, with an inverted head in form of a cup. 4. The yellowish, funnel-shaped Porium. 5. The little, short-stalked Porium, with yellowish, calyculated heads. 6. The small-headed Porium, with extremely minute pores. 7. The small, blackish Porium, with very small pores. 8. The branched, pale-yellow Porium.

F U N G I.

Class the Second. Genus the Fourth.

ACONTIA.

ACONTIA is a genus of Fungus's, consisting of a pedicle, supporting a head, the under part of which is formed into a multitude of little spiculæ, or short, conic, pointed bodies, like teeth; and producing male and female flowers distinct. The male flowers have neither calyx nor corolla, but consist of a single anthera, of an oblong figure, affixed to a very short stamen. The female flowers we see no part of, except the seeds; these are single and roundish, and both these, and the antheræ, adhere to the surfaces of the spiculæ, at the bottom of the head, but they adhere to different parts of them. The generical name is formed of the Greek ακοντιον, spicula.

1. *Acontia album crassum.*

The white, thick Acontia.

This is a very delicate-tasted Fungus. It grows to the height of about four inches. Its pedicle is very thick throughout, but more so near the bottom than elsewhere. It

has a kind of bulb near that part, of the bigness of a walnut, from which it terminates downward in a sort of blunt cone, and goes up, of the thickness of a man's thumb, till near the head, where it swells out again. It is of a whitish colour, succulent and tender. The head is about two inches and a half in diameter; it is thick, fleshy, and undulated at the edges. It is not at all elevated in the center, but often rather depressed. It is thinnest at the edges, and is, throughout, smooth on its upper surface. On the under part it is formed into a multitude of little spiculæ, of a conic figure, and of about a sixth of an inch in length. The whole plant is of a whitish colour, and of a good smell. The flowers stand singly on the upper parts of the spiculæ, and the seeds afterwards appear on the lower.

This species is a native here, but it is not common. I have met with it in Charlton-Forest in Suffex in October. We do not eat it, but in Italy, where it is more common, it is brought to market for that purpose. J. Bauhine calls it *Fungus pœne candidus, prona parte erinaceus*.

2. *Acontia cyathiformis coriacea.*

The tough, hollow Acontia.

This is a very singular species. It rises from the earth with a pedicle of an inch, or somewhat more, in length, and about a fifth of an inch in thickness, tolerably tough, and of a yellowish-brown colour. On the top of this stands a head, of the shape of a hollow, inverted cone, or of a common drinking-glass. It is near an inch and half in height, and as much in diameter at the top, from whence it descends gradually smaller to the base, where it ends of the thickness of the pedicle. This head is throughout of a dusky, ferruginous yellowish colour. Its plain side is marked with a number of parallel circles, and covered with a fine soft down; its other side, which, in the condition it is in, in this hollow state, is its outer one, is covered with short spiculæ, or points; they are broadest at the base, and small at the extremity, and are not more than the tenth of an inch in length. About these hang the antheræ and the seeds of the plant: the former are oblong, the latter round, and extremely minute. The whole plant is tough, and of a very bad smell. It is found in our woods, but not very common. I have met with it in Leicestershire, and have received specimens of it from Yorkshire; elsewhere I have not heard of it. Sterbeck describes it under the name of *Fungus campanulatus lignosus*.

3. *Acontia pediculo teneriore.*

The thin, tender-stalked Acontia.

This is extremely different in its general form from all the other species of this genus. It rises from the ground with a small, fine, and tender pedicle, two inches high, as thin as a small packthread, and of a pale brownish-yellow colour. On the summit of this stands a head of about half an inch in diameter, and of a semiorbicular figure. It is soft and hairy, of a pale yellowish-brown colour, and of an uneven surface. The hollow, or under part, is thick set with oblong, conic spiculæ, on which stand the antheræ and the seeds. It is a very elegant little plant, but of an ill smell. It is not a native of England, but in the woods in the East Indies it is common. Breynius calls it *Fungus, non vescus echinatus, minor, hirsutus, pileolo semiorbiculari fusco*.

The other species of this genus are not numerous, and they will easily be distinguished by their names: they are, 1. The pale-yellow, esculent *Acontia*. 2. The brownish-yellow, large, discoide *Acontia*. 3. The coriaceous, ferrugineous, small *Acontia*, growing in clusters. 4. The black, ramose *Acontia*. 5. The yellowish *Acontia*, with grey, oblong teeth. 6. The squammose, black-headed *Acontia*. 7. The black, funnel-fashioned, tough *Acontia*.

F U N G I.

F U N G I

Class the Second. Genus the Fifth.

L E O T I A.

L E O T I A is a genus of Fungi, consisting of a pedicle and a head: the head is plain on it's upper surface, and neither porous, lamellated, nor echinated in it's under one, but perfectly smooth, and produces separate male and female flowers; the male flowers consisting only of single antheræ, affixed to every short filament, and the female flowers having no part visible, except the seeds, which are small and round. These male and female flowers are placed on the different parts of the same surface of the head, sometimes on the upper surface, and sometimes on the under.

1. *Leotia tenerior elatior capitulo cavo.*

The tender, taller Leotia, with a hollow head.

This is a very delicate and beautiful species; it grows to two inches, or more, in height, and it's head is not more than a quarter of an inch in diameter. The pedicle is as fine as a hair, white and pellucid. The head is of an obtusely conic form, and has no pores or lamellæ, but is perfectly smooth in it's under surface. The pedicles are scarce able to support the weight of these little heads, but bend and totter under them on the least motion. The whole plant is of a snow-white colour, and extremely tender. It is a very difficult object to manage for the microscope, but, if properly examined, a dusty matter will be found on the under side of the head, composed of globules of two kinds, oblong and round, which are evidently the antheræ and the seeds.

This species is common with us in the hollows of rotten trees, and on decayed leaves. I have often met with it on old ash-leaves on Primrose-hill near Hampstead. Ray calls it *Fungus minimus candidus absque lamellis*.

2. *Leotia parvula capitulo plano.*

The little Leotia, with a flat head.

This is a very minute Fungus; it does not grow to more than a third of an inch in height, and it's head is somewhat less than that in diameter: it is, however, very distinct in all it's parts, and a very beautiful species. It's pedicle is thin, and of a whitish colour, and is all the way up of the same bigness: the head is perfectly flat, and is as smooth on one side as on the other; the edges of it sometimes turn up a little. The whole plant is white, and has a disagreeable fungous smell. The lower surface of the head, examined with a good microscope, shews a number of minute bodies scattered over it, part of which are oblong, part roundish; the former are evidently the antheræ, the latter the seeds. This little Fungus is common on rotten wood in Charlton-forest, and in many other places. Micheli calls it *Fungoidaster minimus discoides albus*.

3. *Leotia gelatinosa capitulo subviridi.*

The gelatinous Leotia, with a greenish head.

This is a very singular and beautiful Fungus: it grows to about an inch and half in height, and it's head is about an inch in diameter. It's pedicle is of the thickness of a sixth of an inch, hollow ridged on the surface, and of a fine gold-yellow. It is smallest at the bottom, and grows larger towards the top, where it expands into a kind of head, depressed at the center, and round at the edge; the rims turning in: this head is of a greenish colour, and covered with a gelatinous humour on the surface. It's under part is perfectly plain and smooth, and the antheræ and seeds are found scattered over it in form of a fine dust. We do not meet with this in England, but it is very common in France and Italy. Vaillant calls it *Fungus gelatinosus flavus*. It is of a tender and succulent structure, and of a disagreeable smell.

The

The other species of *Leotia* are, in general, very small; they will easily be distinguished by their names. They are, 1. The scarlet little *Leotia*, with semiorbicular heads. 2. The brownish *Leotia*, with roundish heads, and seeds on the outside. 3. The little, round-headed *Leotia*, found on decayed horses' hoofs. 4. The capillaceous, brown, dwarf *Leotia*, with half-round heads. 5. The horse-dung *Leotia*, with round heads, marked with black spots. 6. The dusky, cat's-dung *Leotia*. 7. The ramose, whitish, cat's-dung *Leotia*. 8. The black, pin-headed *Leotia*; and 9. The beautiful purple *Leotia*, with round heads.

F U N G I.

Class the Second. Genus the Sixth.

DICTYARIA.

DICTYARIA is a genus of Fungi, consisting of a pedicle and a head, the head of which is reticulated on the outer surface, and smooth on the inner; producing male and female flowers separate, both on the external surface of the head. The male flowers are single antheræ, affixed by short stamina to the ridges which make the reticulation of the head; and the female flowers shew no part of themselves, except the seeds, which are scattered singly on the surface of the hollows between the reticulations. The heads in this genus never stand out far from the stalks; and in some of the species they are fastened to them at the bottom, and do not shew any cavity underneath, till cut open. Micheli makes three genera out of this one, by using, as generical distinctions, such as are only specific ones: Linnaeus comprehends all the species, as we do, under one genus; but he calls this genus *Phallus*, a name very well adapted to two or three of the species, but not at all to any of the others. Tournefort also calls them all *Boleti*; but, as *Phallus* is not general enough, and *Boletus* has been used by other writers in other senses, we have given the genus the name *Dictyaria*, from the Greek *δίκτυον*, rete, a net.

1. *Dictyaria capitulo clauso ovato.*

The Dictyaria, with an oval head fastened to the stalk at the bottom. **The Morel.**

This is a very well known and very much esteemed Fungus. It grows to three or four inches high, and its head, which frequently takes up more than half its height, is an inch and half in diameter; its pedicle is irregularly shaped, usually somewhat larger at the bottom than in any other part, and often somewhat protuberant in the middle. It is of a pale brownish colour, and sufficiently robust and strong. The head appears to be a solid oval body, of a reticulated surface, affixed to the top of this pedicle; but, on opening it, the pedicle is found to go up to the summit, and the head to be there fixed to it, and hollow and loose from it all the way down to near its base, where it is again connected with it all round. The inner surface is tolerably smooth, but the external one is reticulated in a beautiful manner by very prominent ridges, which, uniting and separating again at small distances, form a kind of irregular cells, of various figures and diameters. The ridges of the head are of a dusky deep brown, the intermediate spaces of a pale brown, like the stalk. The ridges, carefully examined, will be found, when the Fungus is just ripe, to be covered, as it were, with antheræ; they are extremely minute, and of an oblong figure, and stand single. The seeds are also very minute and round, and are scattered singly over the surface of the hollows between the ridges. The whole Fungus is of a strong but agreeable smell. It grows under hedges, and in the bottoms of dry ditches, in spring, and, in some parts of England, is very common. The botanical writers have all described it: J. Bauhine calls it *Fungus rugosus vel cavernosus*; and C. Bauhine, *Fungus porosus esculentus*. Tournefort, *Boletus esculentus rugosus amplior et orbicularis*.

2. *Dictyaria*

2. *Dictyaria capitulo conico aperto, pediculo bulbofo.*
The bulbous Dictyaria, with a conic, open head.

This is a very singular Fungus, and not less valuable at table than the morel, of which it has the flavour, and all the other qualities. It grows to four or five inches high, and its head is, at the base, not less than two inches in diameter. Its pedicle is bulbous at the bottom, and from thence runs up to the head, of the thickness of a man's finger. It is succulent and hollow, and usually is somewhat scabrous on the surface; its colour is a dusky brown. The head is of a conic form, terminating at top in a tolerably sharp point; its surface is reticulated, like that of the former, but the ridges are thicker and more prominent, and the cavities between them deeper and larger. The colour of the head is a dusky brown; the ridges are deeper coloured than the intermediate spaces, and the inner surface deeper coloured than either. The surface of the reticulations is dusty, as the Fungus grows toward ripening, and the microscope shews this dust to be antheræ of an oblong form, with scarce any visible pedicles. The seeds are oval and larger than in the former; they lie in the cavities between the ridges. We have not this species in England, but it is common in Germany, and is sometimes brought to market in Italy. Micheli describes it under the name of *Phalloboletus esculentus pileolo conico, pediculo cavo, leucophæo*.

3. *Dictyaria capitulo minore umbilicato perforato.* **Phallus.**
The Dictyaria, with a small unbilicated, perforated head.

This is one of the most singular plants of the Fungus kind. Its first appearance is in form a rudely globular body, of a white colour, with an oblong, crooked, single root, which penetrates into the earth, and fastens it to it. After a little time this globular body expands into five or six lacinated segments, which are thick and fungous, and, when cut, are found to consist of two pretty thick membranes, with a glutinous stinking matter between them. In the center of these segments there stands a kind of cup of a tough fungous matter, half an inch high, nearly as much in diameter, and irregularly dentated about the edges. From this cup there rises a thick stalk, smallest at the base, where it is inserted into the cup, but larger a little higher up; it rises to four or five inches in height, and is about three quarters of an inch in diameter, and somewhat rough on the surface. On the top of this pedicle stands a small head, a little more than an inch long, and about an inch in diameter. It is of a conic form, reticulated and callous on the surface, and has an umbilicus or hollow membrane at the top, in the center of which there is a perforation which goes down into the hollow of the stalk. The stalk, when cut, is found to be only a thick membrane, surrounding a vast hollow, capable of admitting a man's finger, and reaching down to the very base, where it is close. The stalk grows taper, where it is covered by the head, as well as where it is inserted into the cup at the base, but the rim of the head scarce stands out at all from it. The ridges of the head are covered with a dusty matter, which is composed of the antheræ; the seeds lie in the cavities between, but they are very small and difficult to be seen; in time the callous matter of the head melts into an extremely foetid, glutinous liquor, which, dropped into water, blends with it, and lets fall to the bottom a quantity of round seeds, which it was carrying to the earth. The whole plant is white, and of a most extremely foetid smell.

It is found in many parts of England in great abundance. I have met with it on the sides of Mendip hills in great plenty, and about Catthorp in Leicestershire. Most of the botanical writers have described it. J. Bauhine calls it, *Fungus phalloides*; and C. Bauhine, *Fungus foetidus penis imaginem referens*. Tournefort calls it, *Boletus phalloides*. It is found in August, September, and October, rarely later.

It has a multitude of creeping filaments, which run various ways under the ground, and from which the single oblong roots, which grow to the globular bodies, which are the first appearance of this Fungus, arise.

The other species of the *Dictyaria* will be easily distinguished by their names. Those of the morel kind, with the heads closed at bottom, are, 1. The whitish, esculent, rough-stalked *Dictyaria*. 2. The yellowish, small-headed *Dictyaria*. 3. The conic-headed, dark, purplish *Dictyaria*. 4. The greyish, green *Dictyaria*, with a very thick pedicle.

Of the open-headed kind are, 1. The great curled-headed *Dictyaria*, with a grey pedicle.

pedicle. 2. The little conic-headed Dictyaria, with a grey stalk. Of the phallus kind, or those with volvæ at the base of the pedicle, are, 1. The smaller Dictyaria, with a purple volva. 2. The little-headed Dictyaria, with a great umbilicus. 3. The pale, yellow Dictyaria, with a head supposed to be without a perforation in the center. 4. The small, oblong Dictyaria of Virginia. 5. The rough-headed, not umbilicated Dictyaria. These three last are indeed all said not to be perforated at the top, but the descriptions of them are in other respects so imperfect, that we are not to pay too much credit to this particular.

F U N G I.

Class the Third.

Such as grow erect, and have no heads.

Genus the First.

CLETHRIA.

CLETHRIA is a genus of Fungus's, consisting of a reticulated substance, or of ramifications frequently uniting one with another, formed into a roundish or oval body, and in some measure resembling the head of a morel, with the inner substance cut out, and only the ridges which form the reticulation left: it is produced from a volva in the manner of the phallus, and some other of the Dictyariæ, and produces distinct and separate male and female flowers.

The male flowers are single Antheræ without any filaments, very small, but of an oblong figure, and adhere to the sides of the reticulations.

Of the female flowers we can distinguish nothing, except the seeds, which are very small and round, and are contained in a mass of a soft matter, glutinous, and of a grey colour, a vast lump of which is contained within the hollow of the plant, while in the volva, which, as it grows up, resolves into a thick foetid liquor, and carries away the seeds with it.

There is so great an analogy between the Clethriæ and the Dictyariæ, that the having and not having a head seems the great difference. Micheli calls this genus Clathrus; we, from the same Greek, κληθρον, a lattice, Clethria.

1. *Clethria ovata reticulationibus crassis.*

The oval Clethria, with thick reticulations.

This is one of the greatest beauties of the Fungus class. Its root is oblong and slender, divided into several ramifications, and penetrating five or six inches deep into the earth; from this there arises a little tuberos body of a dusky purplish colour, and of a rough surface; this enlarges by degrees, till it become of the bigness of a walnut, and of a roundish figure. Soon after this, its outer membrane divides irregularly into four or five broad segments, and within these stands a globular body hollow, and consisting of ramifications variously disposed, and joining one with another, so as to form a kind of lattice-work. The cavity of this body is at this time filled with a substance of a gelatinous nature, but with a mixture of a dusty matter in it. The outer membrane remains in its segments, and forms a kind of cup; and the globular latticed body extends by degrees, carrying up a part of the mass, which before filled it, on the inner part of its ramifications, the rest remaining at the base. The body of the Fungus is now no longer filled with any thing, but is hollow, empty, and composed only of this shell of lattice-work; in this state it acquires an oval figure instead of its round one, being smallest at the base, and growing gradually larger to the top; in this state it makes a most beautiful appearance, the ramifications of which it is composed are of about a third of an inch in diameter, and they form irregular holes between them, oblong, angular, often rhomboidal, and capable of admitting a man's finger. The calyx or volva at the base is of a dusky purple colour; all the rest of the plant of a fine red, spotted within with purple; as the plant rises in height, the ramifications are to be examined to find the antheræ, which then adhere to them in form of a fine powder. The glutinous matter which once filled the hollow of the plant, and which contains the seeds at this time also, melts into a thick, viscid, and very stinking liquor, and this runs out at the cavities between the ramifications, in form of large drops. The best method

thod of finding the seeds is to drop this into water, on which the liquor blending with the water, the seeds fall to the bottom; they are very small and round. The whole plant, though of so beautiful a colour, is of a very foetid smell. Most of the botanical writers have described this species. Tournefort calls it, *Boletus cancellatus purpureus*. C. Bauhine, *Fungus ruber cancellatus*. Cæsalpinus, *Fungus quem ignem sylvestrem vocant*; and Clusius, *Fungus coralloides cancellatus*. It is frequent in Italy, but is not found with us.

2. *Clethria rotundior ramificationibus tenuioribus.*

The rounder Clethria, with smaller reticulations.

This is a very beautiful species, tho' less so than the former. It rises from a thin and membranous volva, and consists of ramifications of not more than a fifth of an inch in thickness, flatted and joining so frequently, as to make very small reticulations. The whole plant is white, but spotted on the outside with red, and is round in figure: the cavity of it, while young, is filled with a white, spongy, glutinous matter, which afterwards runs off in a foetid liquor as in the former species, and the sides of the ramifications are in the same manner furnished with antheræ. Micheli calls this, *Clethrurus olivaris*. Ray, *Fungus pro capitulo laminam longam, latam, multipliciter laciniatam, et convolutam habens, albam, intus punctis rubris creberrimis pictam, calyces squamoso exceptam*. Names of this length we hope will reconcile the reader to our new generical terms, since there is no other means of shortening them. This species is common in Germany. It is produced also in Italy but rarely. We have it not at all in England.

3. *Clethria flovescens ramificationibus compressis.*

The yellow Clethria, with flatted ramifications.

This is another very beautiful species. It rises like the others from a membranous volva or case, and grows to the size of a large pear, and much resembles that fruit in shape. It is composed of flat ramifications, of the breadth of a quarter of an inch, and of about half that measure in thickness. These join frequently so as to give the whole a reticulated form, and compose a sort of open case. The whole plant is of a fine bright yellow colour, and has antheræ on the edges of its ramifications, and a glutinous matter surrounding the seeds in its cavity, while young, which as it grows up melts into a foetid water, containing the seeds in it.

It is a native of Germany, France and Italy, but not of England. Tournefort calls it, *Boletus cancellatus*; and Barrelier, *Fungus coralloides cancellatus flovescens*. These are all the known species of this singular genus.

F U N G I.

Class the Third. Genus the Second.

A R C Y R I A.

AR CYRIA is a genus of fungus's, consisting of a head of a reticulated structure, not hollow, arising from a case or volva, and containing distinct male and female flowers: The male flowers consist only of oblong antheræ, arranged by fours together, on the summit of the same filament, which adheres to the ridges of the reticulation: The female flowers we see no part of, except the seeds which are small, of an oval figure, and lie in the cavities of the reticulations. The species of Arcyria hitherto discovered are all small ones, and they require the assistance of a good microscope to distinguish their fructifications with accuracy. Micheli has divided the genus into two, by using specific distinctions in the place of generical ones. He calls them *Clathroides* and *Clathroidastrum*, from their more or less resemblance to the *Clethria*, or *Clathrus* before described. We call them *Arcyria*, from the Greek, *αρκυριον*, a net.

1. *Arcyria pediculo in volvam expanso.*

The Arcyria, with its pedicle expanded into a cup.

This is a very elegant little plant. Its first appearance is in form of a little round-headed Fungus, with a slender pedicle, in which state it has been described by

by more than one author, under the name of a Fungus non lamellatus. Micheli was the first who gave an account of it in it's more perfect and mature state.

It rises first from the substance it grows on with a pedicle, as fine as a hair, of about a sixth of an inch in height, and terminated at it's top by a round globule; in this state I have known it continue two months, so that they are somewhat excusable who took this for it's ultimate one. After it has continued it's due period in this form, the globule opens gradually at the head, and forms a volva or case like the cup of an acorn, in miniature, but of a somewhat more conic form. In the bottom of this is seen a granule of a rough surface; this by degrees expands and fills the cup, and in a little time after stands as much above it's surface, as is the whole length of the plant beside. This head, when full grown, is of an elliptic form, thicker than the cup it proceeds from in it's middle part, and growing somewhat smaller toward the summit, as well as toward the base. It is not hollow, but is throughout of a reticulated texture. The ramifications, which form the reticulation, are very small, and variously interwoven; on these stand the antheræ, four on each common filament, and within the cells are the seeds.

The whole plant, in it's utmost growth, does not exceed half an inch in height, and it's head, in the thickest part, is not more than a fifth of it's height in diameter; the head is of a dusky purple colour, the pedicle brownish. It is frequent in Charlton forest in Suffex, growing to the surface of rotten sticks that lie on the ground. I have not met with it elsewhere, but doubt not but it is frequent enough, only overlooked from it's smallness. Micheli, who first discovered it, calls it *Clathroides purpureum pediculo donatum*.

2. *Arcyria sessilis volva longiore.*

The sessile Arcyria, with a longer volva.

This is a still smaller plant than the former, scarce ever exceeding a quarter of an inch in height, in it's utmost perfection. It's first appearance is in form of a small, purplish tuberosity, of an oval figure, adhering by it's smaller end to the substance it grows on. After it has been in this state some time, the upper part of it opens, and it by degrees expands into a cup or volva of an oblong conic figure, still adhering by it's lower part, and not raised on a pedicle, as the volva of the former species. From the cavity of this volva there arises a protuberance, which in time becomes a head of an oblong elliptic figure, and of the same reticulated structure, and the same fructifications, with the former. The whole plant is of a purplish colour, with a tinge of scarlet, and makes, when closely examined, a very pretty appearance. It is common on dead sticks in Charlton forest in Suffex. I once also found a great deal of it in one of the woods in Kensington gardens. Micheli calls it, *Clathroides purpureum pediculo carens*.

3. *Arcyria pediculo ad apicem capitis producto.*

The long, pedicled Arcyria, with the stalk penetrating the head.

This is the largest known species of this genus. It grows to an inch or a little more in height, but what it has in height over the former species, it wants in colour, they being both of a beautiful purple, this of a dusky brown. It rises with a very slender pedicle naked, and of more than a third of an inch high; at the top of this stands a little globular tubercle, scarce larger than the head of a pin, which soon opens, and, as soon as it is open, falls off from the stalk, and leaves no mark of any thing having been there. In the place of this membrane there is seen a little oblong body of a granulated surface, which by degrees grows into an head of an oblong form, like those of the former, and of the same reticulated texture, but with the pedicle continued strait up all the way through the center of it to the very summit, and visible all the way in form of a slender black filament, like a horse-hair, only vastly smaller. The substance of the head is of the same reticulated matter with those of the others, and the fructifications are the same in it. The stamina arranged along the ramifications sustain each four antheræ, and the interstitial cavities have the seeds arranged four by four in them. I found, last year, more than a thousand plants of this in a cluster, in a crack of an old water-pipe, near Islington. I have also seen it in Charlton forest, and in Cane wood near Hampstead.

The other species of *Arcyria* will easily be distinguished by their names: they are,
1. The yellow *Arcyria*, without pedicles. 2. The black, very small *Arcyria*, with short pedicles. 3. The deep, brown *Arcyria*, with shorter heads.

FUNG I.

F U N G I.

Class the Second. Genus the Third.

LYCOPERDON.

LYCOPERDON is a genus of Fungi, consisting of a globular or oval body, sometimes sessile, sometimes elevated on a thick pedicle, and covered with a volva in form of an external skin, which usually remains entire, till the plant is full grown; and producing separate male and female flowers, both contained in the cells of a fungous substance. The male flowers consist of oblong, antheræ, very minute clusters of which are affixed to the same filament, which adheres to the sides of the cells. The female flowers are placed in the cavities of a reticulated placenta, which fills up the greater part of each cell, in the spongy matter of the plant: we can distinguish no part of them, but the seeds which are very minute and round.

There is no genus of Fungi which requires so much attention as this, in order to the discovering it's fructifications; in some of the species they are so small, as scarce to be distinguishable at all; in others they are more visible; but, in the very easiest of observation, a short period only is allowed for the examination. The spongy substance, which fills the plant, remains a long time confused, and the fructifications not formed; and when they are formed, and the cells distinct, it is but a very short time before the very matter of the cells breaks to powder, and the seeds fall out of the cavities of the placenta, which themselves also soon after disunite into the fine short filaments they were composed of, and the whole matter, powder, seeds, and filaments together, are discharged in form of a fine dust, through the aperture destined for that purpose in the head of the Fungus.

The accounts we meet with of perfect Fungus's of the same kind, discovered in the particles of the powder within these Fungi, is erroneous. What these observers have taken for little fungus's, has been the placentulae of the cells not yet disunited: in this case they are a kind of rough oval bodies, which may be mistaken for compleat Fungi of the same kind, by people who do not know that the plant arises regularly from a roundish seed, and does not appear itself in it's perfect form, till long after the first shooting of that seed.

Micheli, who has gone so far toward the discovering the fructification of this genus of plants, as to discover the placentulae, which he calls glebulae, with their seeds, in some of the species, divides this genus into four, according to the common error of taking specific distinctions for generical ones. He calls these by the names of Lycoperdon, Lycoperdoides, Lycoperdastrum, and Geaster. The last of these has been received also by many others as a distinct genus, but without sufficient foundation: the radiated matter at the bottom of the body, which distinguishes this genus, as it is called, is no other than a volva thus divided; and all the Lycoperdons have volva, which in the several species approach more or less to that form, in some approaching so near it, as to dispute the title with the allowed geasters.

1. *Lycoperdon volva glabra evanida pediculo crassissimo.*

The thick-stalked Lycoperdon, with a perishing volva.

This is the species of Lycoperdon in which, more than in all others, the fructification is distinguishable. It is one of the largest of the pediculated kinds, growing to eight or ten inches high, and it's pedicle an inch and half in diameter. It's root is very large, and divided into several fibres, thick, short, and pointed at the ends: from this there first arises a large, tuberous body, covered with a smooth and very thin volva, in form of an outer membrane: this bursts, as the plant shoots up, and soon disappears. The plant then rises erect, with it's thick pedicle, which is spongy within, but not hollow: at the top it distends into a head, of the bigness of a large apple, which has a perforation at the summit, thro' which the seeds, and other contents, are discharged, when ripe. This head cut open, while too young, is found to contain only a spongy matter, white, and of no regular structure; but, if carefully watched, and opened, just when the seeds

are

are ripening, this spongy matter is found then to have formed itself into cells of an irregularly angular form, but principally oblong; and, at the surfaces of these, may be found filaments, each sustaining eight or ten antheræ: the internal part of the cells, at this time, contains a shapeless lump, nearly filling them; after a very little time more, this shapeless matter is found to be a cellular placenta, formed of a multitude of fibres, elegantly arranged in a reticular manner, with membranes between; and, in the cells of this placenta, lie the seeds, in the same number with the antheræ, or thereabout. The membrane which covers the head is considerably thick, and is composed of two others, united so closely to each other, that they appear to make but one mass.

This species is found on some of our heaths, and sometimes in woods. On Hindhead in Suffex it grows very abundantly, and in some places about Goodwood. Micheli has described it under the name of a *Lycoperdioides*: it is in perfection in September.

2. *Lycoperdon pediculo brevi globulari volva persistente echinata.*
The short-stalked, globular Lycoperdon, with an echinated, permanent volva.

This is a very pretty species, when the volva is entire. It appears merely globular and sessile, as seen upon the ground; but, when taken up, it is found to have a short and thick pedicle. This is not more than half an inch in length, before it expands into the globular body, which is usually of the bigness of a hen's egg, sometimes considerably larger, and is formed, as the heads of all the pediculated *Lycoperdons* are, of one continued set of membranes with the pedicle. It's surface is all over covered with short conic bodies, terminating in points; these are protuberances of the membrane, which forms the volva, and this membrane itself is very thin, and connected so closely to the next under it, that it seldom separates, till the Fungus is perfectly ripe, and then falls off by piece-meal. Under this is a thicker and tougher membrane, and under that another, which immediately incloses the spongy matter in which the fructifications are lodged. The surface of the whole plant is of a pale, whitish-brown colour; the spongy substance itself is at first perfectly white, but afterwards it becomes of a greenish-yellow, and is regularly cellular, containing antheræ and seeds, lodged in their placentulæ, though very difficultly distinguishable. The pedicle is fastened to the ground by a few fibrose roots, and, at the top of the Fungus, there is an aperture, out at which the seeds, &c. are discharged. This species is very common in our dry pastures, and on heaths. J. Bauhine calls it *Fungus pulverulentus dictus crepitus lupi vulgaris*; and C. Bauhine, *Fungus orbicularis*.

3. *Lycoperdon pediculatum volva hirsuta lacera.*
The pediculated Lycoperdon, with a hairy, lacerated volva.

This grows to three inches in height, and it's head, which is globular, to about an inch and quarter in diameter. It appears first on the surface of the earth in form of a roundish ball, connected to the earth by four or five short filaments: by degrees it rises to it's full dimensions. It's pedicle is as thick as a man's finger, and, at the top, expands into the globular head. It arrives at this it's full height, while yet covered with it's volva, which is a membrane moderately thick and tough, of a dusky-brown colour, and hairy: soon after this, however, as the head begins to swell yet more, the volva, or outer membrane, bursts into three or four parts, which are divided down to the middle of the stalk, and hang from it almost to the ground, with ragged edges, and lacerated extremities. The head, and part of the pedicle, now naked, are whitish and smooth on the surface, and on the summit there appears an aperture, out at which the seeds are to be soon after discharged. The head is full of a spongy substance, which, as it ripens, is divided into cells, containing the antheræ and placentulæ, with their seeds, as in the rest. The spongy substance is white at first, but afterwards of a greenish-yellow. The plant is common in our pastures in autumn. Ray describes it under the name of *Fungus pulverulentus major pediculo longiore ventricoso*.

4. *Lycoperdon globulare volva multifida glabra.*
The globular Lycoperdon, with a multifid, smooth volva.

This species of *Lycoperdon* approaches so nearly to the stellated kind called geaster, and yet is so evidently a common *Lycoperdon*, that we are apt to believe every body will

will be convinced by it, that geaster is not a genus sufficiently distinct from Lycoperdon. It grows to the bigness of a large apple, and is of a tolerably regular, globular figure. It is fixed down to the earth by a great tuft of filaments, and from these it at first rises in form of a little globule, of the size of a nut. It grows very quick, however, and, in two or three days, is arrived at it's full maturity. It is, at first, covered with it's volva in form of an outer membrane, and it continues to be so, till nearly of it's full bigness. When full grown, there appears in the center a kind of commissure, from which, soon after, the volva, or outer membrane, begins to crack. It then divides into six or eight regular segments, which are smooth at the edges, broad at the base, and terminate in points, and in all things resemble the geaster, or stellate Lycoperdon, except that they are not divided to the base of the plant, and, consequently, cannot lie expanded on the ground, but turn their points outwards. The top of the Fungus, uncovered, appears smooth, and of a greyish-white colour, and soon after opens at the top, and discharges the seeds. The spongy substance contained in this head is at first of a bluish colour, but it afterwards becomes white. The fructifications are the same in it as in the other species. We have this Lycoperdon with us on heaths, but not common. I have met with it in Suffex and in Derbyshire in two or three places. Micheli describes it under the name of *Lycoperdastrum rotundum majus leucophæum pulpa sordide cærulea*.

5. *Lycoperdon volva stellata radiis lanceolatis osculo fimbriato.*

The starry Lycoperdon, with lanceolated rays, and a fringed osculum.

This is one of the most singular and most elegant of the Fungus kind, and is one of those plants distinguished by authors into a peculiar genus, under the name of Geaster. When it first appears, it has the form of a small roundish body, but with five or six, or more, evident marks, in form of lines, running from the center toward the circumference; soon after, these lines open into so many cracks, and the volva, which had before entirely covered the body of the Fungus, now bursts into six or eight parts, which recede from one another, and leave the body of the Fungus bare: these divisions reach half way down the substance of the volva, and, as they stand round the body of the Fungus, much represent the volve of the former species, before it's points bend downwards; the difference between these is only, that, in that plant, the entire part of the volva remains fixed to the body of the Fungus, and the tops of the segments, therefore, unable to support themselves erect, bend downwards; whereas, in this, soon after the segments separate, the whole or entire part of the volve also becomes loose, and expands itself flat upon the ground, with the segments in form of rays, extending themselves flat also from it; the volva, thus extended on the ground, is of a whitish colour, and fungous substance, and of about two inches and a half in diameter. It is composed of two membranes, with a soft and somewhat glutinous matter between them. The body of the Fungus is roundish; it stands on an extremely short pedicle, in the center of the volva, and is of the bigness of a small walnut; it's aperture, or osculum, is in the center, and, being elegantly fimbriated, it forms a sort of corona, or summit, of an obtusely conic figure. This body consists of a single membrane, containing a spongy matter, white at first, but afterwards of a brownish-yellow, and of a regularly cellular substance, in which are contained placentulæ, with their seeds in them, and unquestionably flowers also, like those of the rest of the Lycoperdons; though the sole opportunity I have had of examining this species in it's mature state was at a time when they were past, and the very cellular substance containing the placentulæ was falling to powder. At this time the fimbriæ of the aperture separate, and the osculum becomes distended, so that the seeds are easily discharged. This is a native with us, but is very scarce. I found it, in a lane near Catthorp in Leicestershire, in October, where, though I watched it from the beginning, it ripened, before I was aware. I never saw it elsewhere. Micheli describes it under the name of *Geaster major umbilico fimbriato*.

6. *Lycoperdon volva stellata, radiis multifidis, osculo stellato.*

The starry Lycoperdon, with multifid rays and a stellated osculum.

This is a very singular species. It makes it's first appearance in form of a round ball, lying on the surface of the ground: in a little time there appear a number of lines on the summit of this ball, and, soon after this, the volva, which had hitherto covered it, bursts and splits

splits into six or eight segments, the divisions of which run down to the very center almost. These segments, or rays, immediately on their dividing, fall flat to the ground; they are not lanceolated and entire, as in the former species, but most of them are divided into three or four segments each, at the end. The whole volva is composed of two thin membranes, with very little matter between them: in the center stands a round body of the bigness of a small walnut, at the top of which, where the rays of the volva once united, there is a stellated opening, capable of admitting the head of a large pin. This whole body is filled with a cellular, spongy substance, containing flowers, seeds, and their placentulæ, which are all together, with the comminuted matter, of the cellular substance, thrown out, at the stellar aperture at the top. The extended volva of this species seldom measures more than an inch and half in diameter. This is also a native with us, but it is very rare: I have only once seen it in the hands of the late deservedly eminent Mr Littleton Brown, who had collected it somewhere about Cheltenham. Tournefort mentions it under the name of *Lycoperdon vesicarium stellatum*; and Micheli under that of *Geaster medius radiis plerumque multifidis umbilico seu ore stellato*.

7. *Lycoperdon volva stellata, radiis fissilibus.*

The starry Lycoperdon, with fissile rays.

This is one of the most singular of all these plants; the volva is thicker, and of a tougher substance than in any of the others, and is very evidently composed, throughout, of two firm and strong membranes, with a glutinous matter between. It is divided usually only into four rays, and these are considerably broad, and the division runs very deep; they are simple and undivided at the ends. In the center of the volva stands the body of the Fungus; it is roundish, and supported on a short pedicle, and is filled, like the rest, with a spongy matter, containing flowers and seeds, and finally letting them out in form of powder, at an aperture in it's top. As this Fungus ripens, the two membranes of which the volva is composed divide all the way, except just at the tips of the segments, where they are more firmly connected together. It is not long after this division that the upper part, with the body of the Fungus, begins to elevate itself from the lower, and, by degrees, raises itself up, and forms a kind of arched tower, with the body of the Fungus at it's top; the extremities of the segments of the volva also, where the two membranes remain connected, are bent up considerably, so that the whole is raised to at least as much height as the volva had before in diameter. In this state it makes a most singular and surprising figure. It is a native of England, and, so far as we at present know, peculiar to it. We owe the communication of it to the late Mr Nicholls, an apothecary in Westminster, and an excellent Latin description of it in the Philosophical Transactions, to the great ornament of that profession, Mr William Watson.

That gentleman is for separating this and the other stellate Lycoperdons from the others under the name of *Geaster*, as differing extremely in figure; we shall give abundant proof, in the succeeding part of this work, that we are perfectly of his opinion, that, in the plants whose fructification is less visible, we ought to take the external form into the list of generical characteristics: but the result of a very careful examination of the Lycoperdon family, such as it could not be worth any body's while to make who was not to write upon them, convinces us that there is no essential distinction between the Lycoperdons and *Geasters*.

The other species of the Lycoperdon kind will be distinguished by their names. The most singular of them are, 1. The common, oval Lycoperdon. 2. The great, round Lycoperdon. 3. The thick-barked, compressed Lycoperdon. 4. The Lycoperdon, with a long, scabrous pedicle. 5. The small, roundish Lycoperdon, with a very long scabrous pedicle. 6. The white, umbilicated Lycoperdon. 7. The grey, hairy Lycoperdon. 8. The white, woolly Lycoperdon. 9. The cordated, or heart-like Lycoperdon. 10. The white, papillary Lycoperdon. 11. The white Lycoperdon, with quadrangular spines. 12. The rigid, pricked Lycoperdon. 13. The black-barked Lycoperdon. 14. The chestnut Lycoperdon. 15. The smooth, yellowish, round Lycoperdon. 16. The ferrugineous, tuberosus Lycoperdon. 17. The yellow, tuberosus Lycoperdon. 18. The bluish, round Lycoperdon, with fibrous, tufted roots, and a very thick pedicle. 19. The onion Lycoperdon. 20. The yellow, thin-skinned Lycoperdon, with a purple pulp.

Of

Of the stellate kind, or those usually called Geasters, beside the three species already described, there are, 1. The pale-red, stellate Lycoperdon, with a fimbriated osculum. 2. The small, rough, stellate Lycoperdon, with a short pedicle; and, 3. The large stellated Lycoperdon, with a stellated osculum.

F U N G I.

Class the Second. Genus the Fourth.

CARPOBOLUS.

CARPOBOLUS is a genus of Fungi, consisting of a hollow body, in form of a cup, surrounded by a volva of the same form; and containing in it's center a single fruit, of a round figure, to the inside of which adhere the male flowers, and in the cavity of which are lodged the female; which fruit, when mature, is discharged entire, by a violent inversion of the body of the Fungus, and afterwards bursts, and discharges it's seeds. The male flowers are single antheræ, adhering to the inner surface of the upper part of the fruit in vast numbers, each having a short filament to support it. Of the female flowers we can distinguish no part but the seeds, which are very minute, and round. Micheli, who first discovered this singular genus, very justly distinguished it from all the other genera of Fungi: Linnæus, and some others, refer this, with the geaster, to the lycoperdons. We agree with them in referring the geaster to that genus, because the essential characters are the same in all the species of both, and the sole difference is, in the manner of the volva separating from the plant; but, in this case, we are very sensible that every one, who has an opportunity of examining these little plants, will find them sufficiently generically different from the lycoperdon; they have not the same internal structure, nor the same fructification, nor, indeed, do they at all agree to the characters Linnæus himself gives of the genus; it evidently approaches more to the Cyathia, next to be described, than to the Lycoperdon, but it is, in reality, a genus quite distinct from both.

1. *Carpobolus albidus segmentis latis planis.*

The white Carpobolus, with broad, plain segments.

This is an extremely minute plant, and, like the others of this genus, requires a very careful inspection and examination to find out it's characters. It's first appearance is in form of a little whitish mass, of the bigness of a pin's-head, and of a somewhat dusty surface. After it has been in this state some time, it opens at the top, and divides into six or eight segments; this division shews, that what was at first seen was only the external membrane, or volva, of an included Fungus of the same shape which now appears within, divided into the same number of segments, at the edge, with the volva, and perfectly resembling it in figure. The segments of both are but short, and, the division being carried only a little depth, the body of the volva, with that of the included Fungus, becomes of the figure of the half of a hollow sphere, or of a bellied cup, with dentated edges: the segments are broad, and pointed at the end, and they do not stand erect, but droop, or curl, downwards a little. The inner part of the Fungus is connected to the volva by many tender fibres, and there is a soft, gelatinous matter between them, filling up the intermediate space: in the base of the cup there is, also, contained a quantity of the same gelatinous matter, and in that is immersed a small, round fruit, of a whitish colour, as is all the rest of the Fungus: as the cavity of the plant is now exposed, this liquor by degrees dries away, and, the fruit ripening during the same time, the fibres which connect it to the base of the plant, and those which fasten the plant itself to it's volva, wither; and, the connection between the plant and it's volva being thus entirely dissolved, when the fruit is perfectly ripened, the hollow base of the plant rises into a convexity, and the whole cup does the same, the volva still retaining it's place and figure. The inversion of this cup is instantaneous, and, the connection between the fruit and it's base having been already broken, the consequence of it is, that the fruit is thrown up to a considerable distance entire, in which state it remains till, it's outer membrane being dissolved, the seeds are at liberty to grow. The inner cup of the plant, thus inverted on the volva, gives the appearance of two

segments of spheres, applied in the cut parts one to another; but this it retains only a very little time, it soon becomes flaccid, and sinks into the volva again, and they both decay together. The fruit cut open, and examined with a good microscope, is found to be composed of a membrane, forming one cell, which is, in great part, hollow. To the upper part of it's inner surface are affixed the antheræ, which appear like globules of dust, but are of an oblong form, and the rest of it's cavity is filled with roundish, white seeds.

This species is common, in many of our woods, on the stumps of old trees, and on the dead sticks that lie about among the leaves. I have frequently met with great clusters of it in Cane-wood, in October and November. It appears like little white blisters on the surface of the wood.

2. *Carpobolus segmentis longioribus.*

The Carpobolus with longer segments.

The first appearance of this plant is much like that of the former, a mere tubercle, of a whitish colour, and somewhat dusty surface: as soon as it opens, however, it shews itself to be a very different species. The segments of the volva are longer and narrower, and the inner cup or body of the Fungus is divided in the same manner, and is of a beautiful yellow colour, which, with the white of the volva every-where surrounding it, has a very pretty effect. The fruit, which lies at the bottom of the cup, is small and round. The whole plant is not more than a twelfth of an inch in diameter at the rim, and of about the same depth, being nearly the half of a hollow sphere. When the fruit is ripe, the cup, or hollow body of the Fungus, turns inside out, and, becoming instantaneously convex, darts the fruit from it to a considerable distance. The fruit is brown, and of the size of a small pin's-head, round, and full of minute, round, whitish seeds. This species is less frequent with us than the former: I do not remember to have observed it any where, except in Charlton-forest in Suffex, where it is not uncommon about the dead stumps of trees. Micheli describes it under the name of *Carpobolus aureus volva albida, fructu obscuro, feminibus albidis subrotundis.*

3. *Carpobolus segmentis undulatis.*

The Carpobolus with undulated segments.

This is the most elegant and beautiful of all this genus. It appears at first in form of a little red pustule, no bigger than a pin's-head: a thousand of these are often seen together on a stick or rotten board. From this it expands at the top, and the volva and cup itself are both divided at their edges into segments, six or eight in number, very short, and undulated at the edges; in the center of the cup lies the fruit, which is round, and of a dusky purple, all the rest of the Fungus being of a bright vermilion colour. When the fruit is ripe, it is discharged with violence, in the same manner as from the other species. This is frequent, in the woods in Leicestershire, on rotten sticks of all kinds, but it's smallness has made it, like the others, little observed or regarded.

These are all the known species of this elegant little plant; from the descriptions and characters of which it abundantly appears, that they are not of the lycoperdon kind. If the inner and outer cup were composed of two contiguous membranes, and made but one common volva, which, separating afterwards, raised the body of the Fungus with the upper membrane, it would resemble, in that respect, the stellate lycoperdon; but this, though it appears to have been understood to be the case, is not so: the two cups are, from the beginning, two separate bodies, not as in the volva of those Fungi, the two membranes of one substance.

F U N G I.

F U N G I.

Class the Third Genus the Sixth.

C Y A T H I A.

CYATHIA is a genus of Fungus consisting of a hollow conic, cylindric, or hemispheric body, covered with a thin membrane at the top, and containing in it's cavity several roundish fruits, of the nature of the single one of the carpobolus, each affixed to the inner surface of the cup by a fine short filament.

These plants produce distinct male and female flowers, both within the cavity of the fruits. The male flowers consist of single antheræ, adhering to the upper part of the inner surface of the fruit; the rest of it's cavity is filled with seeds, enveloped, while unmaturing, in a mucilaginous matter.

Linnaeus makes the peziza of Dillenius of the same genus with this, but erroneously; the pezizæ have, indeed, the external cup-like shape of the Cyathia, but they have nothing of it's manner of fructification.

1. *Cyathia elatior campanulata.*

The taller, bell-shaped Cyathia.

This is the most frequent with us of any of the species of this genus. It adheres to the substances it grows on, by means of a fibrous root, variously divaricated; from this there first arises a roundish oval or irregularly figured tubercle, of about a fourteenth of an inch in diameter, on which the plant seems to be fixed, as on a base, or pedicle: from this it rises in the form of a bell, but somewhat too long for it's breadth to be exact in that form; it's bottom is narrow, and from this it gradually expands and increases in width to the top, where it is a third of an inch, or more, in breadth, and it's verge is usually, when ripe, turned down a little, and undulated. While young, it is covered at the top with a fine thin membrane, which seems strained over it as a bladder over the mouth of a glass. This membrane soon after cracks in the middle, the cracks running four ways, in the opposite directions, and, soon after, the segments curl up and wither, so as entirely to disappear. When this membrane bursts, the mouth of the Fungus expands, and it's cavity is found to be filled almost to the top with fruits; they are of a roundish figure, and are so large, that twelve or fourteen of them fill up the whole cavity of the bell: they are each affixed to the sides or base of the Fungus by it's own particular pedicle, which, when they are mature, wither and let them loose. The whole plant is of a dusky blackish colour. The fruit cut open, while young, seems a mere mass of fungous matter; but, if opened, when near maturity, antheræ, like those of the other Fungi, will be found adhering singly, each on it's own filament, to the internal part of the surface at the top, and the rest of the cavity is filled with a glutinous matter, in which there are lodged a great quantity of oval seeds. The double microscope is the most useful in these examinations, and, as the glutinous matter is too thick to be conveniently viewed by this in it's natural state, it may be diluted with a little water, and the seeds will then be distinctly visible. To see the antheræ, a segment of the upper part of the fruit is to be placed before the largest single magnifier that can be procured: Mr Cuff has furnished me with my glasses, which are excellent.

Most of the botanical writers have described this Fungus, though few of them have had any just idea of it's fructification. Micheli discovered the seeds; the antheræ have not, that I know of, been described before. Ray calls it Fungus calcyiformis seminifer; Clusius, Fungus minimus anonymus; and Tournefort, Fungoides infundibuliforme femine foetum. It is frequent about the stumps of old gate-posts, and on the stalks of plants trod down and rotting, particularly on the stalks of corn. It is to be found from autumn till April.

2. *Cyathia campanulata hirsuta elatior.*
The taller, hairy, campanulated Cyathia.

This is a very singular species. Its root is composed of two or three fibres, which are each divaricated into several parts; from the joining of these at the top, there arises a tubercle of an irregularly oval figure, on the top of which is fixed the cup or bell: this is narrowest at the bottom, and gradually grows wider to the top. It is of a dusky blackish colour, and hairy on the outside; and its top is covered with a membrane: this splits and disappears, after a little time, and discovers the internal cavity of the Fungus, which is smooth, longitudinally striated, and of a dusky bluish, or lead-colour: a great part of this cavity toward the top is empty, but at the base there are lodged a number of roundish fruits, smaller than those of the former species, and each affixed by its pedicle. The structure of these within is the same with that of the former, but, as they are lodged deep, the cup, after they are thoroughly mature, cracks and splits all the way down in three or four places to let them out. This species is frequent about old wood in Leicestershire, and has been often met with also in the neighbourhood of London.

Dillenius calls it, *Peziza calyciformis lentifera hirsuta*; and Ray, *Fungus seminifer externe hirsutus, interne striatus*. Boccone has it also under the name of *Fungus spermatias calyculatus*.

There are, beside these, three other species of this genus, which will easily be distinguished by their names: they are, 1. The short *Cyathia*, with a broad base. 2. The hemispheric *Cyathia*, with undulated edges, and large black fruit; and 3. The hemispheric *Cyathia*, with a small base. These all agree in their fructifications with the other species. Mr. Doody observes, in Ray's Synopsis of the English plants, that Goedart affirms, that the seeds, as they are called, of these Fungi, when they fall to the ground, hatch in a few days into spiders; but he prudently adds, that he should defer giving his own opinion, as to the truth of it, till he had tried it himself. The truth is, that, beside the fruits found in the cavities of these plants, there is a peculiar species of spider that frequently lays its eggs there.

F U N G I.

Class the Third Genus the Seventh.

ENCÆLIA.

ENCÆLIA is a genus of Fungus, hollow, and containing in its cavity separate and naked seeds. The seeds are extremely minute, and the mouth or aperture of the Fungus not covered by any membrane, so that, when mature, they are by the least motion displaced, and thrown upwards in form of powder. These plants produce distinct male and female flowers. The male flowers are antheræ, standing singly on very short filaments, and appearing in form of a fine dust on the surface of the hollow of the Fungus. The female flowers we see nothing of, except the seeds, which lie naked and scattered over the surface of the same hollow of the plant, but in separate parts of it. These seeds are of an oval figure, and the antheræ are oblong, and much smaller; both may often be distinguished together by a good microscope in the hollow.

Though all the Encæliæ are hollow, they are very variously so; some are very deeply hollowed, so as to resemble a cone set on its base; some are so lightly hollowed, as to resemble only a faucer: some have pedicles, and others are sessile; and, of those which have pedicles, some have them very short, others very long and slender: some of them are finally wide open at the mouth, and others corrugated, and wider in some other part. From this various form of the hollow of the Encæliæ, some of them resemble segments of spheres, some of ovals, and some of cones; whilst others seem only flat bodies, with their edges turned a little up. Dillenius has confounded this genus with the last, under the common name *Peziza*, and Linnæus has followed him in this; but the fructifications are so extremely different, that nothing can be more evident, than their belonging to two distinct genera.

1. *Encælia sessilis, extus pilosa, hæmisphærica.**The hemispheric sessile Encælia, hairy on the outside.*

This is a very beautiful Fungus; it adheres by it's base to the substances it grows on, without the least appearance of a pedicle. It is of the size of the half of a large nutmeg, but more rounded, and indeed usually appears to be the half of a tolerably regular sphere. It is composed of a thin, but tough and fine membrane, and is perfectly even at the surface. It's outside is reddish and hairy, it's inside or cavity smooth and of a fine scarlet colour; when it becomes fully mature, however, it appears somewhat less smooth on the surface than it was before, and, on the least motion given it, a fine dust is seen to arise in a column from it, which is the ripe seed dislodged and discharged by the shaking. Examined by the microscope, the whole surface at this time appears covered with particles, some oblong, some oval; the oblong ones are the antheræ, they stand about the verge or on the upper part of the cup; the oval ones are the seeds, and lie mostly nearer the bottom; the antheræ are connected by a short filament to the body of the Fungus; the seeds seem loose, but, if examined by a very powerful magnifier, each is found to have it's peculiar little cell, in which it lies till thus forcibly discharged; a motion of the Fungus is always necessary to the discharging of these seeds; but when they are thoroughly mature, and fit for the immediate propagation of the plant, the motion given it by the lightest breath of wind is sufficient for the purpose. This beautiful species is very common in our woods, and under hedges in many parts of England. On Iver-heath in Buckinghamshire, and in Charlton-forest, Sussex, I have met with a great deal of it. It grows on old sticks, and sometimes on the ground. Micheli calls it, *Fungoides scutellatum coccineum, intus glabrum, foris ubivis pilosum.*

2. *Encælia lata sessilis marginibus cirratis.**The broad Encælia, with cirrated edges.*

This is an extremely beautiful Fungus. It adheres to the substances it grows on immediately by the base, without the least appearance of a pedicle: from this base it expands itself every way, in a roundish but somewhat irregular form, and lightly hollowed. When fully grown, it is about half an inch in diameter at the top, and about a third of an inch in depth. It consists merely of a fine, tough membrane, of the thickness of a moderate parchment. It is all over of a bright and strong scarlet colour, and always somewhat stronger coloured in the hollow, than on the outer surface: on this outer part there are placed a few, short, fine hairs or cirri, but round the brim there stand a beautiful row of stiff and black ones, very short, moderately thick, and of a glossy surface, these add greatly to the beauty of the plant, and remain erect on it's edge, as long as it retains it's form. It's inside appears of a smooth surface at all times, except when the fructifications are there; in this case it is covered with a kind of fine powder, which somewhat debases it's high scarlet colour. Examined with a microscope, this powder is found to be composed of the antheræ and seeds; the antheræ oblong, and placed near the brim; the seeds oval, and lying in the hollow toward the bottom; at this time a little shake throws them all out in form of a fine dust. This beautiful species is found in many parts of England; it usually grows on old sticks, and decayed trees in woods. I have found it abundantly in some woods near Denham in Buckinghamshire. Ray calls it, *Fungus arboreus acetabuli modo, cavus, coccineus, marginibus pilosis*; and Dillenius, *Peziza acetabuliformis coccinea, marginibus pilosis.*

3. *Encælia sinuosa sessilis.**The sinuous Encælia, without a pedicle.**Jew's Ears.*

This is a much less regular plant, in it's manner of growth, than either of the preceding ones. It arises from a broad base, by which it adheres to the substance it grows on, without any pedicle; from this it expands itself every way, so as at length to form a variously sinuous and undulated substance, somewhat hollowed, and of an oblong, or irregularly roundish figure. It is composed of a single tough membrane, and is often an inch and half, or more, in diameter. It's edges are not even, but high-

er in some places, and lower in others. It's colour is a dusky bluish, approaching to black, and it has often ridges in several parts of it, forming other smaller and irregular figures, roundish, or oblong, and sinuous; these give it much the appearance of the human ear, whence it obtained it's English name, Jew's Ears. It's surface is at all times, except when about it's fructifications, perfectly smooth; at this period it appears covered with an extremely fine dust scarce perceivable without a microscope, and this dust, when examined with a very powerful magnifier, proves to be regular, oval seeds in vast numbers, and about the edges are often perceived the antheræ, single, oblong, very slender, and adhering to short pedicles or filaments.

This species is often met with in the stumps of old trees, and on other rotten wood. But there is another kind of irregular *Encælia* hereafter to be mentioned, under the name of the membranaceous expanded species, which is common on the old water-pipes about Islington, and in the like places, and is pretty constantly received in the shops in it's place. It is described by C. Bauhine, under the name of *Fungus membranaceus auriculam referens five sambucinus*; and other authors call it, *Auricula Judæ*, and *Fungus sambucinus*, from it's often growing on the elder. There is, however, a yellow *Encælia*, more frequent on the elder, which many will have to be the true *auricula Judæ*: it is much recommended against quinsies and sore throats. Physicians do not often prescribe it; but the common people very frequently use a decoction of it in milk for these purposes, and it is said with success. An infusion of it in water is also recommended by many authors, as a collyrium against inflammations of the eyes.

4. *Encælia conica pediculo brevi.*
The conic Encælia, with a short pedicle.

This is a very small, but a very pretty Fungus; it grows to about a third of an inch in height, and is throughout of a whitish colour and smooth. It's root consists of two or three slender fibres; from these arises a very small pedicle of about an eighth of an inch high, and at the top of this stands a cup of an inverted conic figure, formed of a thin membrane, and with it's pedicle perfectly resembling a common wine-glass, with a short foot. It's cavity is, when in the state of fructification dusty, and, on disturbing it, sends up a fine powder: this powder consists partly of antheræ, which were placed at the edge of the cavity, and partly of oval seeds which were lodged in all the other parts of it. This species is common on rotten sticks in our woods, some times on dead leaves. Micheli calls it, *Fungoides minimum infundibuliforme, album, hederæ foliis innascens*.

5. *Encælia pediculo longissimo, ore lato.*
The long-stalked Encælia, with a broad opening.

This is a very singular Fungus; it's root is tuberous and perennial, of a black colour on the outside, and whitish within. From this there usually grow six or eight plants together; the pedicle of each is of the thickness of a wheat-straw, and about two inches in length; toward the top it begins to expand, and, in fine, forms a cup very wide at the mouth, not very deep, and of a conic figure with the base upward. The colour of the whole plant is a dusky brownish yellow; it's cup is smooth on the inside, except when in the state of fructification; then it is somewhat dusty, and on a shake will discharge it's dust or powder, like the rest of this genus. The antheræ, which compose that part of this powder which is nearest the top of the cup, are oblong; the remainder of it is formed of oval seeds, placed in little shallow cavities: these seeds are larger than those of several other species, but it requires a very good microscope to discover the plainest of them with any degree of accuracy. This species is less common than any of the others. I have once or twice met with it in Charlton wood, between Greenwich and Woolwich. Micheli calls it, *Fungoides cespitosum infundibuliforme, fulvum, radice nigra, tuberosa, perenni*.

The other species of *Encælia* will easily be distinguished by their names: those without pedicles are, 1. The yellow, deep *Encælia*. 2. The white, deep *Encælia*. 3. The angular, shallow *Encælia*, the *pezita* of Pliny. 4. The curled, undulated *Encælia*. 5. The yellow, aculeated *Encælia*. 6. The white, aculeated *Encælia*. 7. The white *Encælia*, hairy on the outside. 8. The broad, scarlet *Encælia*. 9. The deep,

deep, scarlet Encælia. 10. The thick, rough Encælia. 11. The furrowed, hemispheric Encælia. 12. The black, rough Encælia. 13. The lenticular Encælia, with hairy edges. 14. The purple, shining Encælia. 15. The little, yellow Encælia. 16. The little, scarlet Encælia. 17. The little, brown Encælia. 18. The pear-fashioned Encælia, with serrated edges. 19. The scarlet, pear-fashioned Encælia, with a marginated edge. 20. The acorn-cup Encælia. 21. The great, expanded, membranaceous Encælia. Of the Encælia which have pedicles are, 1. The Fungi-form, curled Encælia. 2. The Encælia, with a very thick pedicle. 3. The undulated Encælia, with a long pedicle. 4. The funnel-shaped Encælia. 5. The ramified, tall Encælia. 6. The tall Encælia, white without, and red within. 7. The grey, short Encælia. 8. The little, scarlet, bending Encælia. 9. The little, white, cup Encælia. 10. The great, open Encælia. 11. The black Encælia, with a brown spotted mouth.

F U N G I.

Class the Third. Genus the Eighth.

CLAVARIA.

CLAVARIA is a genus of Fungi, consisting of a single, oblong, erect body, or stalk, of an uniform surface, and of a soft, fleshy, and succulent structure.

Vaillant first established this genus of Fungi, but he gave no characters of it. Dillenius has confounded it with a number of others, under the name of Fungoides; and Linnæus has taken in, under it, the Coralloides of Tournefort, and others, which are of a distinct genus, as is evident from their structure and fructification. The Clavariæ produce distinct male and female flowers. The male flowers are antheræ, adhering four or more in a cluster to the same filament: the female flowers have nothing distinguishable, except the seeds which are round, and are lodged in shallow cavities. The male and female flowers are both produced on the surface of the plant; the male flowers only on the upper part, the female only on the lower. Of the Clavariæ some are very tall and slender, others thicker and shorter; some are nearly of an uniform thickness all the way, others are gradually smaller from the base to the extremity, where they terminate in a point; but the far greater part are smallest at the bottom, and large toward the top. They some of them grow single, others in clusters; and, finally, some of them are hollow, but the far greater part are solid.

1. *Clavaria simplex durior apice obtuso.*

The harder, simple Clavaria, with an obtuse top.

This has for it's root a little tuberosity of a blackish colour, from which it rises in form of a small club; it's lower part is roundish, and of the thickness of a small straw; in this form it runs up half it's height, but from this part upwards it swells into twice that thickness, and terminates at the top in an obtuse point. It's colour is black; it's substance fleshy, but somewhat hard; it seldom grows quite strait; and it's height is from an inch and half to more than two inches: in it's mature state, if it be carefully drawn through the fingers, there will a subtle powder be left on them, which, examined by the microscope, appears to be composed of a mixture of oblong and mutilated particles, and of pretty regularly round ones. The plant itself, carefully examined, will be found to have the oblong ones growing all round it's upper part, and adhering in little clusters to the ends of filaments, four or more to each filament; these are the antheræ, or male flowers, and these alone occupy the top of the plant: lower down as far as to the bottom of the thick part, there lie the other round particles or seeds in clusters, four or more together.

The plant is common in many parts of England; in autumn among high grass. I have found it abundantly about Denham in Buckinghamshire, and elsewhere. Ray calls it, Fungus ophioglossoides niger; and Vaillant, Clavaria ophioglossoides nigra.

2. *Clavaria*

2. *Clavaria cespitosa mollior apice obtuso.*
Softer, blunt-pointed, cespitose Clavaria.

This has for it's root an irregular tuberosity, of the bigness of a horsebean, or larger, and usually flattish, and with ragged edges; from this there generally arise six or eight plants pretty close to one another. They grow to about an inch and half high, and are of a soft, fleshy structure, and yellow colour. Every plant is, at the lower part, of the thickness of a large packthread; but from a third of the height, or thereabouts, it begins to expand, and continues larger till near the top, where it again diminishes a little, but ends in an obtuse point. The plant is solid, and of a fungous texture; on it's top, in the seeding-time, stand antheræ in clusters, and all the way down it's thicker part are lodged the seeds in little clusters also. The antheræ are oblong, and of very short duration. The seeds are round, and remain longer: in general however, the person, who would examine the fructifications of the bodies of this class, should either carry his microscope about him to do it on the spot, or take them home with the earth about them, while yet in an unripe state, that they may grow up and fructify under his eye. The English botanists know a single, yellow *Clavaria*; but this tufted one has not been mentioned by any author, except by Micheli, under the name of *Clavaria cespitosa, media, lutea*. It is found in September and October on Putney heath, and in some other places about London, but it is not very frequent.

3. *Clavaria fistulosa apice acuto.*
The hollow Clavaria, with a sharp point.

This is extremely different from the other *Clavariæ* in it's form. It's root is a flattish tubercle, of the breadth of a shilling, and of about a sixth of an inch in thickness; from this there usually arise five or six plants standing very close to one another. Each plant is about two inches high, and at the base, where it is thickest, is about an eighth of an inch in diameter. From this part it grows up gradually smaller all the way, and at the top terminates in a point. It's colour is white, it's substance soft and fungous; it is naturally round, but is easily pressed flat in any part, and when cut, or broken, is found to be hollow. The antheræ are oblong, and stand in clusters about the tops of the plant: the seeds are round, and are placed also in little clusters, all the way down the surface to the very base. It is not common with us, but I have observed it in the pastures about High Wickham in Buckinghamshire, and about Catthorp in Leicestershire, pretty plentifully. It grows among the high grass, and is usually met with in September, October, and November.

The other species of *Clavaria*, after the descriptions of these three, will easily be known by their names: they are, 1. The great, yellow, club-headed *Clavaria*. 2. The great, white, club-headed *Clavaria*. 3. The great, reddish, curled *Clavaria*. 4. The broad-headed, yellow *Clavaria*. 5. The green, ophioglossoid *Clavaria*. 6. The yellow, ophioglossoid *Clavaria*. 7. The little, yellow, *Clavaria*. 8. The ophioglossoid *Clavaria*, with a hairy pedicle. 9. The snow-white ophioglossoid *Clavaria*. 10. The white, cespitose, solid *Clavaria*.

F U N G I

Class the Third. Genus the Ninth.

M E R I S M A.

MERISMA is a genus of Fungi, consisting of stalks variously divaricated and ramose, erect, and terminating at the extremities either in very small and flat expansions, or in slender twigs, of an uniform surface, and soft fleshy texture.

These Fungi produce distinct male and female flowers, on the same parts of their surface. The male flowers consist only of oblong antheræ, which stand single, each on it's separate filament, which is very short. The female flowers offer no part to view but their seeds; these are of an oval figure, and are placed among the antheræ singly,

singly, and in less number than in almost any other kind of Fungus. Both the male and female flowers stand on the tops of the branches in the *Merismæ*; whereas, in the *clavariæ*, the male flowers occupy the upper parts of the plant, and the female the lower. In all the *Merismæ*, I have yet had opportunity of observing, the antheræ stand single, and the seeds also are placed in the same manner: in all the *clavariæ* the antheræ are placed four or more on every filament, and the seeds are disposed in the same sort of clusters on the plant. Tournefort and others call this genus *Coralloides*, from the resemblance of some of the species to the corals. Vaillant calls it, *Corallo-fungus*. Dillenius, *Fungoides*; among many other genera, which he has improperly placed together under that name. Linnæus comprehends both this and the former genus under the name of *Clavaria*. We have thought it necessary to separate distinct genera; and as the term *Coralloides* has been applied by Dillenius to a genus of the mosses, and the other names seem little expressive of the characters of the plant, we have called it, from its frequent divisions and ramifications, *Merisma*, from the Greek, *μερισμω* to divide.

1. *Merisma ramulis teretibus bifidis.*

The round and bifid-branched Merisma.

This is an extremely elegant Fungus. Its root is a tuberous body, of the size of a nutmeg, of a whitish colour, and very uneven surface. From this there usually grow three or four separate and distinct plants: each rises with a single, roundish stem, of the thickness of a large packthread; and this grows larger, as it becomes higher, and, at the height of about half an inch, or less, divides usually into two, sometimes into three, parts; each of these afterwards divides into others, and those ramify again in the same manner; the extremities are usually pretty regularly bifid, and the rest of the plant is, in general, divided in the same manner. The branches are all round; and the whole plant is about two inches, or more, in height, and is of a fleshy, soft substance, and of a pale-red colour. At the extremities of the branches stand the antheræ, on their filaments, and, among these, the seeds are disposed; they are oval, and lie in hollow sockets of the same form. The stamina arise from the interstices between these. This elegant species of Fungus grow annually, in considerable plenty, in the Arbor Vitæ Grove at Goodwood, where once the greatest of all patrons of botany in England has often admired its structure and fructifications.

2. *Merisma ramulis compressis varie dissectis.*

The flat-branched, variously-divided Merisma.

The root of this species is small and tuberous; from this it usually arises single, with a roundish stem, of the thickness of a man's little finger; this, however, scarce grows to any height single; it divides, almost immediately from the base, into three, four, or five branches. These go up but a little way, before they divide, each into several others, and those ramify again; the ramifications, at length, terminate in somewhat broad and variously-dissected extremities: all the branches are of a compressed, or flattened figure. The plant grows to three or four inches in height, and its colour is a pale yellow. All about the tops of the ramifications stand, at the proper period of its growth, antheræ, of an oblong figure, supported each by its single stamen, arising from the interstitial spaces between certain little cells, in which are placed oval and very minute seeds, one in each cell. We have this Fungus in the pastures of Northamptonshire, and in many other parts of England; it is very common in September. It is a very beautiful one, but it is but of short duration. Tournefort calls it *Coralloides flavum*; and J. Bauhine, *Fungus ramosus flavus*.

3. *Merisma barbata ramulis teretibus.*

The bearded Merisma, with round branches.

This is a very singular and very elegant species. Its root is a small, tuberous body, from which it arises with a very thick and round stem; this increases in bigness till about an inch high, where it is often not much less than an inch in diameter. From this part it divides into a multitude of round branches, which again divide into others, and these again into yet smaller, so that, at the extremity, the branches are not thicker than hairs,

hairs, and in an innumerable quantity. The whole plant grows to about four inches in height, and the tufted top is often more than three inches in diameter; the branches all run up round to the very extremities. The whole is of a fleshy, soft texture, and of a whitish colour, with more or less tinge of red in it: about the extremities there stand a great number of antheræ, and the seeds are disposed, as in the other species, among them: they are, however, so extremely minute, that a very powerful magnifier is necessary to get the sight of them. I have not met with this species in any more than one place in England, which was near Mendip-hills. Tournefort has described it under the name of *Coralloides dilute purpurascens*.

The other species of *Merisma* will easily be distinguished by their names: they are, 1. The white, large, flat-branched *Merisma*. 2. The great, ramose, white *Merisma*; this is of the form and size of a colly-flower. 3. The little, dusky-yellow *Merisma*. 4. The very small, yellow *Merisma*, found on the barks of trees. 5. The glutinous, yellow *Merisma*. 6. The silvery, white, fine *Merisma*. 7. The short, horned, violet-coloured *Merisma*. 8. The short, flat, and broad-branched, Virginian *Merisma*. 9. The porcupine *Merisma* of Boccone. 10. The setaceous *Merisma*. 11. The buck's-horn *Merisma*. 12. The red buck's-horn *Merisma*. 13. The little, capillary, violet *Merisma*. 14. The blue, gelatinous *Merisma*. 15. The cristated, verrucose *Merisma*. 16. The white *Merisma*, with purple tops. 17. The fiery-red *Merisma*, with short ramifications. 18. The broad-branched, flesh-coloured *Merisma*. 19. The yellow *Merisma*, with short, expanded ramifications. And, 20. The grey, corniculated *Merisma*.

F U N G I

Class the Third. Genus the Tenth.

X Y L A R I A.

XYLARIA is a genus of Fungus, consisting of branches, or stalks, of a woody structure, tough, firm, and hard, and of an uneven surface.

These Fungi produce separate male and female flowers. The male flowers consist only of antheræ of an oblong figure, supported on very short stamina, and are placed on the upper parts only of the plant. The female flowers are lodged in cavities, or cells, in the lower parts of the plant, and consist of placenta, of a roundish figure and gelatinous substance, to which are affixed great numbers of roundish seeds.

Dillenius confounds the plants of this genus with those of the former, and of several others, under the name of *Fungoides*. Micheli calls the genus *Lichen agaricus*. We have given it the name *Xylaria*, from the Greek *ξύλον*, wood, these being the only Fungi that are truly of a woody texture. The fructification of one of the species of this genus is described very accurately in the Memoirs of the Paris Academy, and Micheli has described all the parts of it, as we have seen them; but he mistakes the farina for the seed, and *vice versa*, and has figured numbers of the seeds, adhering to one another, in form of a necklace, by means of the glutinous matter of the placenta, under the name of a peculiar configuration of the farina.

The cells, in which the placenta with it's seeds are placed, are, in some species, round, in others cylindric; in some they are buried wholly in the substance of the plant, and have only an aperture corresponding with it; in others they protuberate from within, a little way out beyond the surface, and, in some others, they are tubercles affixed to the plant, and not penetrating at all into it's surface: some of the species are simple, some divaricated, and some branched.

1. *Xylaria compressa extremitatibus divaricatis.*

The flattened Xylaria, with divaricated extremities.

This is one of those Fungi which, in their different states, put on very different forms; and it has, like some others, been, for that reason, described under different names, as several different species. It grows to two inches, or more, in height, and is, in the broadest part, sometimes a third of an inch, or more, in diameter. It rises with a single stem, of a compressed shape and rough surface; this sometimes runs up single, tapering all the way, till it terminate in a point; sometimes also it is roundish,

or

or very little flattened; more usually, however, it divides towards the top into two or more branches, which, as they extend themselves in length, increase also in breadth, and, after they have thus expanded themselves into a sort of palmated form, terminate in two, three, or more divisions, resembling fingers. This is the most usual state of the plant, but it occasionally assumes many other forms, and frequently, in a cluster of twenty or thirty plants, some will be so very unlike the others, that, if they did not grow together, it would not be easy to know them for the same plant from their shape. Whatever be the form of the plant, however, its colour and texture are permanent; it is tough and hard as wood, and is black all the way up to the extremities, which are white and dusty; the rest of the surface is often, in many parts, covered with roundish tubercles. The dusty matter on the white tops of this plant, when examined by a microscope, proves to be no other than a vast number of antheræ, of an oblong figure, standing singly, and adhering to short filaments; the tubercles on the other parts of the plant are of a roundish figure: they have each a small aperture in the center, and an hollow forming the cells in which the placenta with the seeds lie. The placenta are small, roundish, and of a glutinous structure, and the seeds either simply cover the surface of them, or adhere to one another, by means of this glutinous matter, in long series, propagated from the several parts of the placenta.

This species is very frequent with us on old wood, and the stumps of decaying trees. Ray calls it *Fungus ramosus, compressus, niger, apicibus albidis*; and Tournefort, *Coralloides ramosum, nigrum, compressum, apicibus albidis*.

2. *Xylaria teres, pediculata, cespitosa, simplex.*

The cylindric, simple, pediculated, cespitose Xylaria.

This singular plant rises to about an inch, or little more, in height. It usually grows in clusters, twenty or more of the plants near one another; but each is distinct, to the base, and evidently springs from its own separate root. It consists of a pedicle, round, and of the thickness of a small packthread, and about a quarter of an inch in length; on the summit of this stands an oblong, cylindric body, three quarters of an inch, or more, in length, of the fifth of an inch, or thereabout, in diameter, and obtuse at the end. It is not all the way of the same uniform thickness, but appears tumified in certain places at small distances, in the manner of a pod, with large seeds in it, which mark the places where they are, by swelling up that part of the pod. All over the surface of this body there stand little protuberances, with perforations in them. These open into round cavities, in which are the seeds of the plant, affixed to a roundish or oval, gelatinous placenta; the antheræ are less distinct than in the former species; they form a kind of brown powder about the top of the plant, and, when examined with a large magnifier, are found to be oblong bodies, affixed to the surface of the plant by short stamina. In the specimen I examined, I found many of these on the lower, as well as upper part of the plant; but these latter were all loose, so that it is not certain whether they originally grew there, or were fallen from the top.

This species is not common with us: I found it once on a stump of a tree in Charlton-forest, and once on an old gate-post near Loughborough in Leicestershire. Ray calls it *Fungus piperi Æthiopico similis five digitatus niger*, and supposes it to be the *Hypoxylum five excrementum ligni putridi fungosum* of Mentzelius, but erroneously.

3. *Xylaria teres ramosa.*

The cylindric, ramosa Xylaria.

The root of this species is extremely long; it creeps under the surface of the ground to two feet, or more, in length, and is tough, firm, black in colour, somewhat compressed, and of the thickness of a large packthread: from this, at certain distances, there rise plants, which grow to near two inches in height. The stem is usually single, and thicker than the root it rises from; it is round and rough on the surface. This divides, at the height of half an inch, into several branches, which again divide into others, and are usually bifid at the ends: they are round all the way up, as at the base, and are black from the base to near the extremities, where they are of a pale reddish colour. These tops are dusty, and, when examined, this dust is found to be composed of antheræ, of an oblong figure, each affixed to its own filament. The little protuberances of the rest of the stalk are the coverings of so many cells, which contain each its roundish placenta,

placenta, and on it a vast number of minute seeds. I met with this plant in Charlton-forest, and never saw it elsewhere. Micheli seems to describe it under the name of *Lichen agaricus terrestris, digitatus, niger, apicibus alborufis, radice longissima reptatrice*.

The other species of *Xylaria* will easily be known by their names: they are, 1. The small, black, cupressiform *Xylaria*, with white tops. 2. The yellow, military *Xylaria* of Vaillant; and, 3. The brown *Xylaria*, with red tops.

F U N G I.

Class the Third. Genus the Eleventh.

ÆCIDIUM.

ÆCIDIUM is a genus of Fungus, consisting of a tuberous, or merely crustaceous matter, of a tolerably firm structure, and marked with round protuberances on the surface, which are the coverings of certain cells, in which both the male and female flowers of the plant are produced, though separate from one another. The male flowers are composed of single antheræ, each adhering to it's particular filament, which is very short. The antheræ are oblong and tumid, and are placed on the upper part of the internal surface of the cells. The female flowers consist of a placenta, of a fungous substance, all around which are placed small, roundish seeds, each in it's separate cell. Micheli is the only author who has discovered that there was any such genus of plants as these, though some of the species are considerably large, and, one would think, could not be overlooked: he has confounded them, however, with the *Xylaria* before described; the cells, indeed, are of the same nature with those of that genus, but, in all other respects, the plants are as different as those of any two genera can be: nor is even the fructification, when accurately examined, at all alike, as appears from the generical characters. We have called this genus, distinguished by it's peculiar cells, *Æcidium*, from the Greek *οικίδιον*, cellula.

1. *Æcidium tuberosum reniforme.*

The tuberoſe, kidney-shaped Æcidium.

This singular plant arises from a broad and long base, from which it extends itself into a tuberous mass, of an inch and half in length, and an inch in diameter, and in shape much resembling a kidney. Sometimes a cluster of these grow together, and form a mass of a variously botryoide surface; but more usually they grow single and separate, though very near one another. It is of a tolerably firm structure, but light; it's surface is variously elevated, and is ornamented with a number of wart-like protuberances, rising but to a little height, flat at the top, and frequently with a lesser protuberance in the center. These tubercles are the coverings of so many cells, which are of a roundish figure, and contain the antheræ, affixed to their upper internal surface, and the seeds affixed to placenta in the lower part of the cavity. The antheræ are oblong, the seeds very small and round. The colour of the whole plant is a dusky brown, sometimes blackish. We have it frequent in some of our woods, growing to the dead stumps of trees near the root. Micheli calls it *Lichen agaricus, crassus, bovinum renem veluti representans, niger et quasi deustus*. I have five specimens of it, taken from the root of a holly, in the garden at the Spaniards at Hampstead. Insects of various kinds are apt to eat their way into it, and their exuviae, and other remains, are often found in it, sometimes almost at the center, sometimes nearer the surface. The holes made by these creatures are to be carefully distinguished from the cells of fructification of the plant. I have never seen any of it quite black, but the burnt-look, described by Micheli in his name, is very common in it, and very singular.

2. *Æcidium crustaceum cellulis maximis.*

The crustaceous Æcidium, with very large cells.

This is an extremely singular plant: it is of a soft, fungous texture, and of a dusky brownish colour. It extends itself irregularly, in form of a thick crust, over the roots and stumps of decaying trees. It's dimensions are uncertain, but it's thickness is usually about

about a fifth of an inch. The surface is full of large and hemispheric tubercles, with an opening at their top. These lead into the cells in which the parts of fructification of the plant are disposed; the antheræ occupy the upper part, hanging by their separate stamina, from the internal surface; the rest of the cavity is filled by a placenta, to which adhere a great number of extremely minute seeds. We have this plant pretty frequent in our own woods, about the stumps and roots of decayed trees; but it is not regarded any more than the other species of this singular genus, many of which, doubtless, have fallen in the way of our botanical writers many times, but, from their having very little of the appearance of plants, have been overlooked by them. It is frequent in Hornsey-wood toward the latter end of November.

3. *Æcidium crassius superficiei splendente.*

The thick, shining Æcidium.

This species adheres to the substance it grows on by a very broad base, from which it extends variously, sometimes into a semicircular figure, sometimes less regularly; its surface is usually full of large protuberances, and its thickness frequently as much as its length. In shape it often much resembles the common agaric, but its substance is harder, and its colour black. Its whole superficies is smooth and glossy, and seems as if covered with a glutinous fluid; but there are observed in it, when examined closely, a number of little prominences, less glossy than the rest; they are of a roundish figure, and have each a perforation in their center: these lead into deep, cylindric cells, the internal surface of which, in the upper part, is covered very thick with stamina; the rest of the cavity contains an oblong, cylindric placenta, to which adhere a multitude of seeds. This is scarce with us: I found it once on Mendip-hills, growing to the stump of a decayed oak. The mass was as big as a man's fist, and semicircular: near it there were others, less regularly shaped. Micheli calls it *Lichen agaricus, tuberosus, niger, agarici officinalis facie*.

The other species of the *Æcidium* will be easily distinguished by their names: they are, 1. The white, thick *Æcidium*. 2. The black, thinner *Æcidium*, growing under the barks of trees. 3. The hairy, grey *Æcidium*, growing on old oaks. 4. The small, blackish, bullated *Æcidium*, growing under the barks of decayed trees. 5. The white, scutated *Æcidium*, growing on the ground. 6. The tufted, black *Æcidium*. 7. The tufted, red *Æcidium*. 8. The smaller, tufted, pale-red *Æcidium*. 9. The ferrugineous, tufted *Æcidium*; and, 10. The dusty, black, tufted *Æcidium*: all these latter species grow either in the clefts and fissures of old trees, or between the bark and the wood.

F U N G I.

Class the Third. Genus the Twelfth.

CERATOSPERMUM.

CERATOSPERMUM is a genus of Fungi, consisting of a tough, fungous matter, disposed into more or less regular figures, and producing slender bodies, in form of crescents, for the reception of the parts of fructification. These plants produce both male and female flowers separate, but placed one among another. The male flowers are antheræ, of an oblong form, supported singly by short and slender filaments. The female flowers we can discover nothing of, except the seeds, which are placed singly among the antheræ, each in its separate little cell.

1. *Ceratosperrum orbiculare sessile.*

The orbicular Ceratosperrum without a stalk.

This is a very small, as well as a very singular plant. It adheres to the substance it grows on by a broad base, and from this it expands itself every way a little, till it has formed a semicircular body, two thirds of which is the base, and is fixed down; the remainder is a little elevated, and forms the edges, so that the whole makes a kind of dish a little hollowed: its substance is tough and firm, its colour black. In this state it remains a considerable time; but, when the period of its fructification comes on, it

produces, from the several parts of it's upper surface, oblong bodies, thickest in the middle, and pointed at each end, and bent into the form of a horn, or crescent. These adhere to the plant by one of their points, and the other usually hangs over the edges of it. On the thicker part of this crescent, or horn, there stand a vast number of single antheræ, supported by short filaments, and, among them, a great number of very minute oval seeds, each lodged in it's cell. The whole plant does not exceed the diameter of a large pea. I have it very frequent in our woods in February and March, on the stumps of old trees, and on rotten sticks. Micheli calls it *Ceratosperrum nigrum minimum, discoides, e diversarum arborum ramorum emortuarum corticibus, et præcipue corylo, erumpens.*

2. *Ceratosperrum pediculatum cavum.*
The hollow, pediculated Ceratosperrum.

This is as small a plant as the former, but somewhat more singular in it's figure. It rises with a short, thick, and rounded pedicle, which, at it's top, expands into a semi-circular body, somewhat hollow, and resembling a kind of cup. The whole plant is not more than a quarter of an inch high. It's cup, or hollow part, is scarce a sixth of an inch in diameter. It is common to meet with the plant in this state; but it's fructifications are more rarely seen. The whole plant is white, and of a tough fungous substance, the edges of the cup even and smooth, and the whole plant beside a little hairy. When in flower, there arise a vast cluster of little horns, or crescents, forty or more, from the whole internal surface of the cup; they are fixed by one end, and are of a beautiful scarlet colour, so that, with the white of the cup, they make a very beautiful appearance. The two extremities of these horns are, at all times, naked, but the middle appears dusty, and, when examined by a powerful microscope, is found to be covered over partly with antheræ, partly with seeds. The seeds are oval, and lie in small cells; the antheræ are oblong, but more tumid than those of the former species. This is frequent with us in woods, on the stumps of old trees. Before it is in it's state of fructification, it much resembles some of the common cup Fungus's. Micheli has also described this: he calls it *Ceratosperrum minimum cornucopiodes.*

3. *Ceratosperrum planum crassissimum.*
The flat, thick Ceratosperrum.

This is a subaqueous plant. It extends itself over old wood that is laid in rivers, and over many other substances there, in form of a thick crust. It assumes no particular, determinate figure, but spreads in every direction where it has room. It is of a fungous substance, of a brownish colour on the outside, and white within, and is usually full of cracks and holes; the surfaces of which are of the same colour with the external surface of the plant. In this form it will spread sometimes to ten or twelve inches every way, and is often more than half an inch in thickness. It's surface is smooth and lubricous, as most other things are that lie long under water. From every part of it's surface there grow horns, or crescents, of a dusky-brownish colour, about a tenth of an inch in length, and of the thickness of a small hair; on the surfaces of these, about the middle, there lie seeds of an oval form in their cells; the antheræ I have not yet seen, though I have, more than once, sought after them. We have this species on the boards at the mill-tails in Buckinghamshire in many places.

These are all the species of the *Ceratosperrum* hitherto known.

F U N G I.

Class the Third. Genus the Thirteenth.

I S A R I A.

ISARIA is a genus of Fungi, consisting of stalks of a simple or ramose figure, formed of circular series of fibres, arranged round a cavernous axis, and each fibre having at it's end a capsule, in which are the fructifications of the plant.

The

The *Isariæ* produce distinct male and female flowers, both contained in the cavity of the same capsule, or cell. The male flowers are antheræ, standing in clusters, on very short stamina. The antheræ themselves are of a tumid figure. The female flowers consist of a placenta of an oval figure, and gelatinous matter, to all parts of which adhere round seeds. The *Isariæ* are all very small plants, and the surface of them all is alike of a beautiful granulated structure, it being all composed of globular bodies, applied as closely as possible to one another.

Micheli met with two species of this genus, which he very justly distinguished from all the other Fungi, under the name of *Puccinia*. Whether the plants he examined, however, were not mature, or by whatever accident it happened, his account of their fructifications is very imperfect. We have called the genus *Isaria*. From the Greek, *is*, a fibre, these being the only known Fungi that are composed wholly of fibres, supporting the fructifications.

1. *Isaria ramosa varie divisa.*

The variously, divided, ramose Isaria.

This is an extremely beautiful little plant. It rises with a single stem rounded, and of the thickness of a small packthread; this runs up single to about a third of its height, and from thence begins to divide into a number of lesser branches; these ramify again, and at length the whole forms a kind of little bush, with the branches, all erect, and terminating in obtuse points. The whole plant is of a deep orange colour, and its height is more than half an inch. The surface of the branches, examined with a microscope, appear beautifully and regularly granulated: when cut transversely, and examined, they are found to consist of a cylindric, cavernous core, around which are ranged series of fibres very short and slender, each, at its extremity, supporting an oval body, which is the receptacle of the fructifications. This body, carefully opened, is found to contain a placenta of a gelatinous substance, and roundish figure, on which there lie great numbers of seeds. The surface of the cavity in many places also appears thick covered with a kind of dust, which, when carefully examined, appears to consist of antheræ affixed in clusters to small stamina.

This beautiful Fungus is common in Charlton-forest in Suffex, growing to the decaying bodies of beeches and other trees. I never saw it elsewhere, nor has any author described it.

2. *Isaria simplex.*

The simple Isaria.

This is a very small plant, scarce exceeding, at its utmost growth, a quarter of an inch in height, or half as much in diameter. It grows to old wood, by a broad base, from which it rises smaller all the way, to the top where it terminates in an obtuse point. It is seldom quite strait; usually bowed, or bent a little: its colour is a dusky whitish; its surface granulated; when cut transversely, it appears to be formed in the same manner as the former, of series of rays or fibres issuing from a cone or central body, and each terminated by a capsule at the surface; we have this on dead sticks, and sometimes on old gate-posts in damp woods.

Micheli has mentioned this species under the name of *Puccinia non ramosa major pyramidata*. The fructifications in this are much less distinct than in the former; and in the following species, which was the only one, beside this, that Micheli knew, they are still less so, whence it is not wonderful that he did not perfectly discover them.

3. *Isaria ramosa bifida.*

The bifid ramose Isaria.

This is an extremely minute Fungus, but, when examined with the help of a good magnifier, it is a very beautiful one. It rises with a small single stem, which almost immediately afterwards divides into two, and each of those ramifications afterwards into two more, and so on, till the whole forms a little bush of branches all dichotomously divided. The whole plant is scarce a quarter of an inch in height, and its branches, as if too weak to bear their own weight, often droop and bend: a multitude of the
plants

plants generally grow together, and in that case they resemble a hoar frost, upon the substance they grow on. When examined by the microscope, the surface appears granulated; and, when cut, the branches are found, like those of the others, to be made up of filaments affixed to an axis, and terminated by little globular bodies. We have this species plentiful in January on old sticks in Hornsey-wood. Micheli mentions it under the name of *Puccinia ramosa, bifurcata, minima*.

The other species of *Isaria* will easily be distinguished by their names: they are, 1. The simple, scarlet *Isaria*. 2. The simple, snow-white *Isaria*. 3. The ramose, white, larger *Isaria*. 4. The brown, ramose *Isaria*. 5. The very small, black, ramose *Isaria*.

F U N G I.

Class the Third. Genus the Fourteenth.

P H Y S A R U M.

PHYSARUM is a genus of Fungi, consisting of vesicles or hollow bodies resembling inflated bladders of a roundish or oval figure, and sometimes sessile, sometimes affixed to pedicles, in which hollow bodies are contained the parts of fructification. The *Physara* produce distinct and separate male and female flowers. The male flowers are single antheræ, adhering to short filaments, and growing on the internal surface of the capsule. The female flowers are seeds very minute and round, affixed to placentæ, formed of multitudes of fibres, and often surrounded with a gelatinous matter. The capsules are always closed in all parts, and, when the seeds are to be discharged, they burst irregularly: they contain only a single cavity, and are formed of a single membrane, and that usually but a very thin one. In some the placenta is small, and lies loose in the cavity; in others it is larger, and fills it almost entirely up with the appearance of a reticulated substance. Micheli divides the species of *Physara* into three genera, under the names of *Mucor*, *Lycogala*, and *Mucilago*; but the characters are in general the same in all, and the distinctions principally owing to the different state of the plants.

1. *Physarum capitulo rotundo, pediculo capillari.*
The round-headed Physarum, with a very slender pedicle.

This is a very common species, and constitutes one of the most frequent kinds of what we call mouldiness. It consists of a fine capillary pedicle, of a greyish colour, and perfectly pellucid; on the summit of which stands the capsule or head, which is round, colourless, and pellucid at first, but after a little time greenish, and more opaque, and in fine black. This bursts irregularly when quite mature, and exhibits the appearance of a multitude of seeds mixed with a great number of filaments: but it opened with the point of lancet under the double microscope, before it is quite so mature. The seeds are seen to be affixed to a placenta, which afterwards separates into these filaments, and on the insides of the capsule are also seen evident globules of farina. This is very common on animal and vegetable substances, kept damp, and decaying. Hook has figured it much enlarged in his *Micrographia*; Malpighi calls it, *Mucedo capitulo diaphano, deinde viridi et nigro*; and Micheli, *Mucor vulgaris capitulo lucido per maturitatem nigro, pediculo griseo*.

2. *Physarum capitulo ovato, pediculo brevi.*
The oval-headed, short-stalked Physarum.

This is a very pretty species, though extremely small. It rises from the substance it grows on, with a very short capillary pedicle; on the summit of which stands a head or capsule of an oblong oval figure. The whole plant is snow-white in colour; it is not more than a quarter of an inch in height, and the capsule makes two thirds of that measure. When mature, it opens irregularly, and is found to contain a placenta of it's own figure, almost entirely filling it up, and very thickly spread over

over with seeds. The antheræ are easily seen on the inner surface, with a good microscope.

This species grows on rotten wood, and is very common with us. Micheli calls it, *Mucilago minima clavæ effigie lactei coloris pediculo donata*.

3. *Physarum sessile subrotundum*.

The roundish Physarum, without a pedicle.

This species arises from a broad base, and extends itself gradually in a regular manner, in form of a globular, or nearly globular body; when full grown, it is of the size of a small pea; and, several plants of it usually growing together, they often resemble a flat cake of a fungous matter, with a botryoide surface; in this case, however, where separated, each is found distinct, and inclosed in it's own membrane, tho' injured, in it's figure, by the pressure of the others. The colour of this species is grey; it's substance soft and tender, and, if opened, it is found to contain a placenta of a reticulated texture, filling up every part of it; this is formed of interwoven fibres, and contains a great number of seeds in it's interstices; but the whole is surrounded, and it's spaces all filled with a glutinous matter, which runs out in drops, on wounding it, and carries the seeds away with it. This species is common with us on the moist stumps of trees. Micheli calls it, *Lycogala griseum majus*.

The other species of *Physarum* will easily be distinguished by their names: they are, 1. The small, white, round-headed, long-stalked *Physarum*. 2. The little, white-tufted *Physarum*, without any pedicle. 3. The cream-coloured, sessile *Physarum*. 4. The copper-coloured, sessile, pisiform *Physarum*. 5. The scarlet *Physarum*, of the size of a millet-seed. 6. The small, sessile, kidney-shaped, yellow *Physarum*. 7. The red, hemispheric, pediculated *Physarum*. 8. The flat-headed *Physarum*. 9. The white, crustaceous, large, and irregularly shaped *Physarum*. 10. The grey, small, globular, pediculated *Physarum*. 11. The white, crustaceous, sessile *Physarum*. 12. The greenish, crustaceous, sessile *Physarum*; and 13. The yellowish, crustaceous, sessile *Physarum*. Most of these latter species have been described by Dillenius and others, under the improper name of *Byssi*.

F U N G I.

Class the Third. Genus the Fourteenth.

MONILIA.

MONILIA is a genus of Fungi, consisting of a pedicle supporting a number of naked seeds, arranged together in series like the beads of a necklace.

The *Monilia* all produce distinct male and female flowers. The male flowers are antheræ, placed on short stamina, on the summit of the pedicle, or near the summit, surrounding it in form of a fine powder. The female flowers we are able to distinguish nothing of, except the seeds, which are arranged together in series, by means of a glutinous matter, and stand sometimes close to one another, sometimes more distinct. In some species these chains of seeds are laid along both sides of the summit of the stalks; in others they are wound round in clusters, and form a kind of tuberos knobs, which terminate it; in others they rise at distances from the very summit of the pedicle, in form of fingers; and, finally, in others they rise more numerous in this form, and join near their bases, so as to form a kind of globule, with the extremities of several of the chains of seeds hanging down from them. These clusters of the series of seeds are what Micheli took for placentæ; he has also divided this genus into two, under the names of *Botrytis* and *Aspergillus*; but the differences, this division are founded upon, are rather specific than generical; we have therefore arranged them all together under one genus.

1. *Monilia capitata simplex.**The simple capitated Monilia.*

This is one of the smallest of these small plants, but by the help of a microscope it appears very beautiful. It rises with a single capillary stem, of the height of about a tenth of an inch, at the top of which are first seen a multitude of minute antheræ, in form of a fine powder, with the rudiments of the future series of seeds very small among them: after a very little time these antheræ disappear, and the series of seeds begin to grow up in their places. These stand so close, that they soon conjoin at their bases, and form, in the whole, the appearance of a globular head, with the extremities of several series or chains of seeds hanging from it. The whole plant is of a whitish colour.

It is frequent on old wood in damp cellars, and other the like places; the seeds, when separated, as they may easily be, by shaking the substance on which the plant grows, are found to be of an oval figure. Micheli mentions this under the name of *Aspergillus capitatus, omnium minimus, feminibus ovatis.*

2. *Monilia divaricata caule crassiore.**The divaricated Monilia, with a thicker stalk.*

This is not at it's full growth more than a quarter of an inch in height, and it's top spreads to two thirds of that measure in diameter. It grows erect with a single stem, somewhat thicker than that of the former; near the top this divides into five or six ramifications, on the summits of which are first seen the antheræ, in form of a fine grey powder, with the rudiments of the series of seeds in little protuberances, down both sides of the stalks: soon after the antheræ disappear, these series or chains of seeds grow larger, and, in fine, they cover all the extremities of the ramifications; they are roundish, very large in proportion to the size of the plant, and of a greyish colour, as is also the whole plant.

This species is common on dead sticks, in our woods, in October and November. Micheli calls it, *Botrytis comata, grisea, caule simplici crassiore, feminibus rotundis.*

3. *Monilia ramosa extremitatibus globosis.**The ramose Monilia, with round extremities.*

This is also a very little plant, rarely exceeding a quarter of an inch in height, and coming under the common name of Mouldiness, as well as many others of this class. It rises with a single capillary stem of a greyish colour, which toward the top divaricates into several branches, and these again subdivide into others. At the extremities of these subdivisions stand at first antheræ, in form of a fine white powder; but afterwards chains of seeds are produced there of the same grey colour, with the rest of the plant, and, which rolling themselves round, only the extremities of the ramifications give them that globular figure visible to the naked eye, though the particles it is composed of are not distinguishable but by a very good microscope.

This species is frequent with us, on decaying, vegetable substances.

The other species of *Monilia* will easily be distinguished by their names: they are, 1. The small, simple, white *Monilia*. 2. The blue-headed, simple *Monilia*. 3. The round-headed, gold-coloured *Monilia*. 4. The black-headed, ramose *Monilia*. 5. The small, cespitose *Monilia*, with yellow heads. 6. The snow-white cespitose *Monilia*. 7. The black, cespitose *Monilia*. 8. The branched, white cespitose *Monilia*.

F U N G I.

Class the Fourth.

*Those which grow under the surface of the earth.**Of this Class there is but one Genus.*

TUBER.

TUBER is a genus of Fungus, consisting of a roundish or irregularly tuberous body, rising into a number of pointed prominences on it's surface, and consisting of a soft fungous matter, full of winding cells.

The tubera produce distinct male and female flowers, in the same membranous capsules.

These capsules are of an oval figure, and are lodged in the body of the plant; on their inner surface there stand extremely minute antheræ, in form of powder, which seem to adhere immediately to the membrane, without any pedicles. These are the male flowers: of the female we only see the seeds, which are placed in an uncertain number, from two to six, in the cavity of the same capsule.

1. *Tuber prominentiis majusculis elevatis.**The Truffle, with large, high prominences.*

This is the Truffle most frequent at the table, and the best tasted of all the kinds. It is of an irregularly tuberous figure, sometimes round, sometimes oval, and sometimes oblong; at times also it grows sinuous, and much more irregular. It's bark is variously raised into large and high prominences, terminating in a kind of points, and is of a dusky, brownish colour, often looking as if burnt. When cut, the pulpy substance is of a dusky colour, and very full of winding cells; it is of a very agreeable flavour, and of a less spongy structure than the pulp of the common mushroom. The capsules in this species are very large, and of an oblong, oval figure; the number of seeds in each is various, but it rarely exceeds three, often there is only one. This grows to a very considerable size, where the soil suits it; the bigness of a man's fist is not uncommon with it. This species is a native of Italy, and does not succeed so well with us, as the next, which is natural to our soil. This is the species described by the botanical writers under the name of *Tubera terræ edulia*. The other species is not much known, as distinct from this, though it truly is so.

2. *Tuber prominentiis minoribus depressis.**The Truffle, with smaller, and lower prominences.*

This species grows to the size of a moderately large apple sometimes, but the bigness of a pigeon's egg, or a little more, is it's more usual standard: it is of an irregularly roundish form, and of a dusky chesnut colour on the surface. It's bark is raised into prominences, but they are lower, as well as smaller, than those of the former, and terminate in more obtuse points. The pulp is of a paler colour, and the cellular windings less frequent. This species has a very agreeable flavour, though not so high as the Italian kind. It's capsules are also much smaller, and of a roundish figure: we have this in several parts of England native. I have met with it in Leicestershire pretty abundantly, where the hogs were the only creatures that had found out such a delicacy, till I informed the neighbourhood of it. The first English Truffles we had an account of, were those discovered, at Rushton in Northamptonshire, by Dr Hatton; but they were of the Italian kind, and had been brought over with the earth about the roots of some trees, many years before planted there, and had continued to propagate themselves from that time.

3. *Tuber purpurascens superficiei granulata.*
The purplish Truffle, with a granulated rind.

This is the smallest of all the Truffle kind; its general size is that of a nutmeg, sometimes it grows to the bigness of a walnut, but it very rarely exceeds that standard. Its bark is raised into prominences, in the manner of the rest, but they are so small, that they rather deserve the name only of granules; they are roundish and obtuse at the end; the colour on the surface is a dusky brown, the pulp is of a pale purplish colour, redder near the surface than toward the center. The smell is like that of the Truffle, but faint; the taste subastringent, and very disagreeable, with a sweetness at the going off like that of Terra Japonica. The capsules in this species are very large, and they usually have four, five, or six seeds in each. These are natives of England, but they are not common with us. Merret, in Ray's Synopsis, speaks of purple Truffles of the bigness of hazel nuts, which he met with in Hampton-Court park; they must have been of this kind. I have met with these in Yorkshire, and in some parts of Wiltshire.

Some authors have recommended a cataplasm of Truffles, as a sovereign remedy in quinies. Cardan tells us of people almost miraculously cured by it. At present we know no use of it in medicine, but it is a favourite ingredient in our sauces.





Agaricus 11.



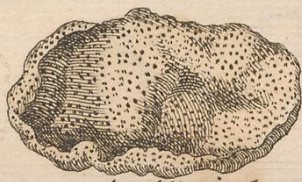
Poria 1.



Odontia 13.



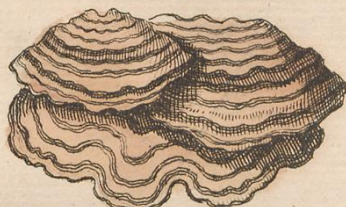
Agaricus 12.



Amphitretia 1.



Scindalmia 1.



Stereum 2.

Erect Fungi Consisting of Pedicles Crowned with Heads



Lepiota 3.



Aconitium 1.



Solenium 2.



Lactaria 1.



Porium 1.



Dictyaria 3.



Lepiota 15.

Erect Fungi which have no Heads



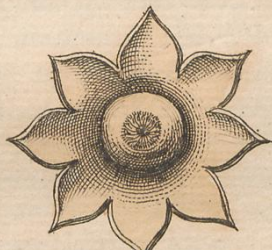
Clathria 1.



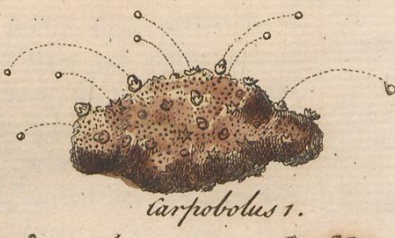
Arcyria 1.



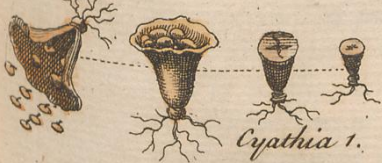
Lycoperdon 3.



Lycoperdon 6.



Lophobolus 1.



Cyathia 1.



Encalia 2.



Clavaria 2.



Merisma 2.



Xylaria 1.



Cladonia 1.



Ceratoppermum 1.



Isaria 3.



Physarum 1.

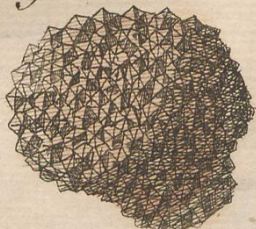


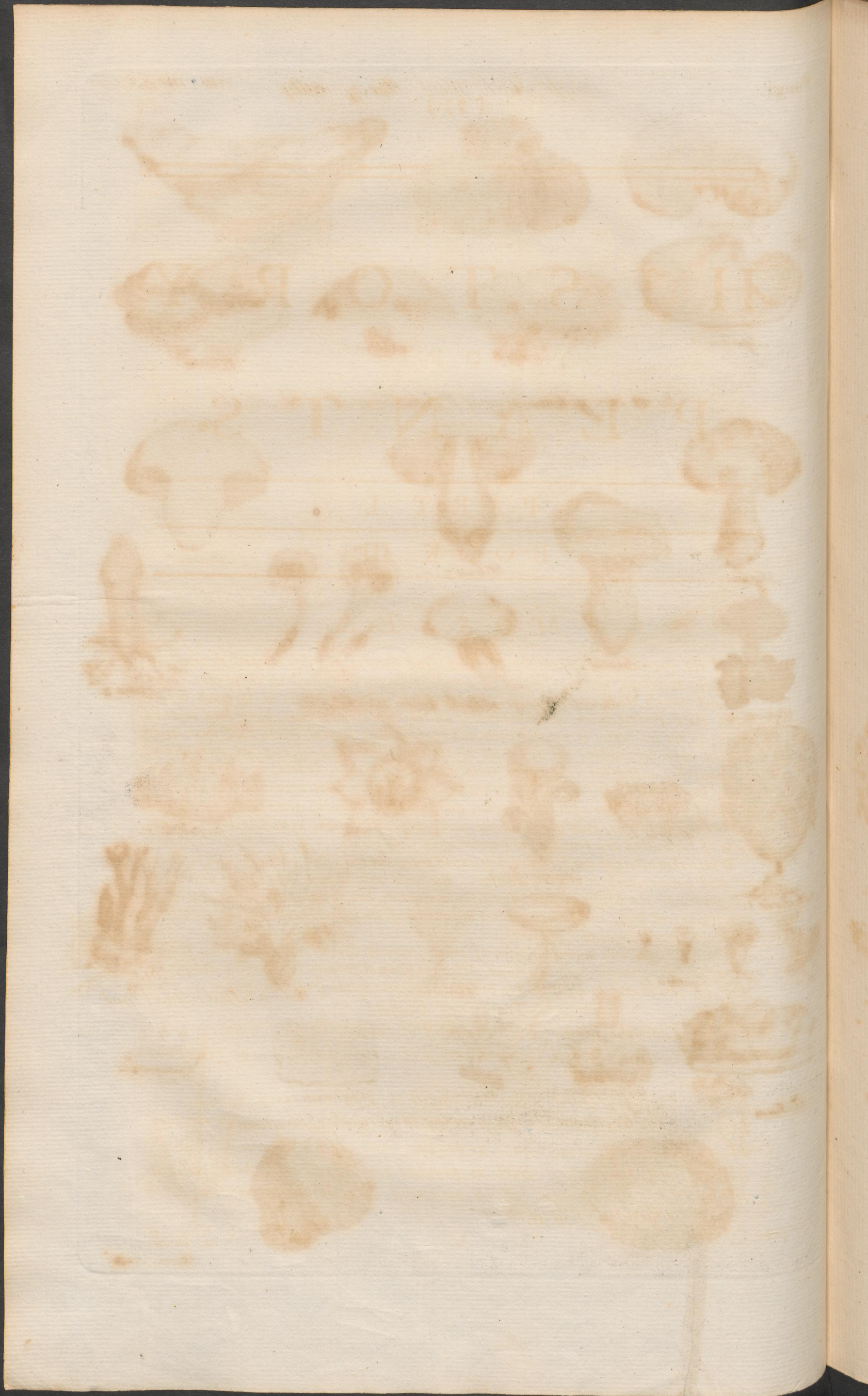
Monilia 1.

Subterranean Fungi growing in no regular Direction.



Tuber





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 it's 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*.

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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 flexile. 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 saltiness, 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 conserva, and gives a tolerably perfect description of it, under the name of *Conserva mucosa, confragosia 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 *Conserva 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 *Conserva*, and, by others, under that of a *Coralline*. Dillenius calls it *Conserva marina gelatinosa, corallinae instar geniculata, crassior*; and Kempfer, *Musculus 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; *Musculus 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 Orcele 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 spatans*; and Plukenet, *Musculus arboreus madara spatans*. Kempfer has it under the name of *Musculus 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, *πόντιον 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, Orisella, Oriselle, 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 Orisella 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 orselle 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 orsella. 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 flexile 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 sbo lifera, 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 tuberculofus. 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 namen 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. Pannonius 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.

P O L Y T R I C H U M.

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-fides, 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 its 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*; Læfeliuſ, *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 folijs*; 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.

MARCHANTIA 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 dusky 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 sound. 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 pennate 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 its 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; its 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 its 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 its 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. Its 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 its 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 it's 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 it's 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 it's 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 it's 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.

