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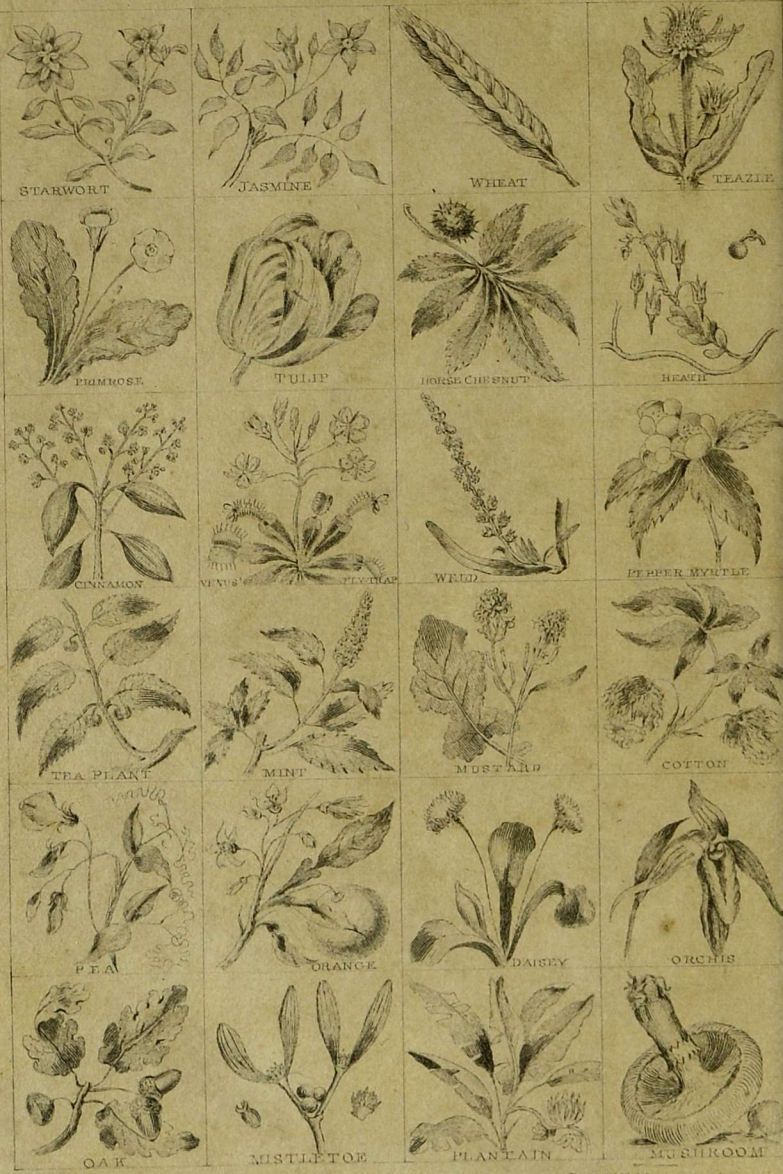

THE 24 CLASSES OF THE LINNÆAN SYSTEM.

PINNOCK'S

CATECHISM

OF

THE ELEMENTS

OF

BOTANY.

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from her loving
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A

CATECHISM

OF

BOTANY.

CHAPTER I.

INTRODUCTION.

Q. What is meant by Botany[1]?

A. The science or knowledge of plants, that is, of those organized bodies which compose the vegetable kingdom[2].

Q. What are the several parts or divisions of this science?

A. Vegetable Anatomy, or a knowledge of the structure of plants, that is, of the different parts of which they are composed; Vegetable Physiology, or a knowledge of the growth and functions of plants;

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[1] Botany from the Greek Βοτάνη, a plant or grass; a person who is skilled in plants, or studies plants, is called a *Botanist.*

[2] For a definition of the vegetable kingdom, as distinguished from the animal and mineral kingdoms, see Catechism of Natural History.

Vegetable History, or a knowledge of the first places in which plants are produced, the periods of their duration, their relations to the other productions of nature, and the uses to which they may be applied by man; and particular Botany, or botany properly so called, which signifies a knowledge of the specific characters, classification, and names of plants.

Q. Is there not a division of the subject known by the name of Medical Botany?

A. Yes. The knowledge of the medicinal qualities of plants; but that is, strictly speaking, a part of their natural history.

Q. Whether are plants or animals the more numerous?

A. It is not easy to say. In some parts of the world animals abound the most, for a single tree or even a leaf, may have many thousand inhabitants; but there are other places again in which the number of plants is certainly greater.

Q. What is the proper situation of plants?

A. There are considerable varieties of situation, but it may in general be said that plants are situated on surfaces, and have one part which is called *a root*, which penetrates into the surface, or at least adheres to it, and another which is called *a stem* of some description, which rises above the surface or rests upon it.

Q. Have not all plants roots and stems?

A. No. There are many plants which have no stems properly so called, some that do not require to have roots in the ground, and there is at least one plant which has neither root, stem, nor leaf.

Q. Of what then does it consist?

A. Of one great flower-looking expansion, each of the petals or lobes of which is at least a foot long, and nine inches broad, and the nectary or cup in the centre large enough to contain several gallons.

Q. Where is this singular plant found?

A. In the forests of some of the East Indian Islands, where it has sometimes but not often been met with, sticking to, and apparently growing on the trunks of trees.

Q. What is its name?

A. It has no English name, and is known to Botanists by that of *Rafflesia Arnoldi.*

Q. Are there any plants in Britain that resemble this?

A. No, none that resemble it in size or flower-like appearance; but some of the *Lichens* [1], which grow on the trunks of trees, and which may be found almost in all parts of the country, and more especially where the air is cold and moist, have a cup-like appearance, and are often tinged with beautiful colours.

Q. Are plants distributed over the whole surface of the globe?

A. Generally speaking they are.

Q. What are the principal exceptions?

A. Those places, such as the regions near the poles, and the higher parts of lofty mountains, which

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[1] Lichen from the Greek Λειχὴν, rough on the surface, or made up of granular points like the surface of the tongue.

never have their temperature above the point at which water freezes, places which are very hot, and at the same time destitute of moisture, and places where the surface consists of nothing but very small stones.

Q. What does the surface consist of where vegetation is wanting?

A. Surfaces that are destitute of plants, or as it is called barren, in consequence of their cold, consist of rock or the fragments in which that rock has been broken, or they are covered with snow.

Q. And those that are hot and too dry?

A. They also consist of rock, or the powder into which that rock has been decomposed by the action of heat, and they are sometimes loose sand, and at others hard like a brick, according to the nature of the rock.

Q. What are the causes of barrenness where there is neither too much cold nor too much dry heat?

A. The chief cause is water, which by rubbing pieces of stones against each other reduces them to a powder, as sand, to a tough paste, as clay, or keeps them shifting like mud.

Q. Then what are the principal causes of a want of fertility?

A. Too great cold, too much heat without moisture, and a surface which is so loose, or so constantly acted upon by the water, that plants cannot settle on it.

Q. Are there any secondary causes?

A. Many mineral substances, such as metals, and some salts, prevent vegetation where otherwise it might exist.

Q. Are the surfaces you mention constantly barren?

A. That depends upon the seasons. Those which have the temperature always as low as freezing, or are composed of loose sand, may be considered as permanently barren; those in which the winter is very cold are barren of many plants during that season; and those which have the summer exceedingly warm and dry, have their barrenness during the summer, or dry period, at whatever season it may happen. We have examples of the barren winter in Britain, more especially in the high and bleak districts of it; and we have partial examples of the barren summer, in thin and sandy places, even in Britain, and complete ones in Southern Africa, and many parts of the East Indies, where for months the soil is as dry and naked as a trodden highway.

Q. The cold winter is not then totally destitute of plants?

A. No. Many of the mosses, even in very cold regions, are in full growth and bloom in the winter, serving as food for birds and quadrupeds.

CHAPTER II.

NUMBERS, DISTRIBUTION, AND USES OF PLANTS.

Q. How do you divide plants, as regards their general structure and habits?

A. Into those in which the substance of the plant

is made up of little cells or cavities with partitions between, and those which are made up of tubes, have what is called a vascular structure, and admit of being divided into threads or fibres. The first may be called *cellular*, and the second *vascular*.

Q. What is the meaning of cellular.

A. A structure in which the juices are contained in little cavities, which have no necessary communication with each other lengthwise.

Q. And what is a vascular structure?

A. One in which the fluids are contained in pipes or canals, in which they *may* rise and fall.

Q. Are there any other distinctions?

A. There are; the cellular plants are, generally speaking, *cryptogamous*, and the vascular ones *phenogamous*.

Q. What is the meaning of *cryptogamous?*

A. That the flowers and seeds of the plants either have not been discovered at all, or that they are so small and obscure, as not to be easily seen.

Q. What plants have these characters?

A. The fungi, such as mushrooms and toad-stools, the lichens which encrust walls and rocks, and also the greater number of plants that grow in the sea, have no visible flowers; and the flowers of many of the mosses are so small and concealed that they are not easily seen.

Q. What is meant by *phenogamous* plants?

A. Plants which have visible flowers.

Q. Do those differ from the former in any other respect?

A. They are generally made up of a greater number of parts, they are much larger and more conspicuous, and they are also, taking them upon the whole, much more useful to man.

Q. Is there any remarkable division of the phenogamous plants?

A. Yes, there are two portions of those plants, that have their general structure aud character very different,—*endogenous* and *exogenous*.

Q. What is the meaning of endogenous?

A. Growing at the centre—plants of that kind increase only in length, and have the outer part of the stem oldest.

Q. Which are some of those plants?

A. The grasses which form the covering of the earth: and among which are included not only all the long and slender leaved plants, which are used as pasturage or for hay, but grain plants, wheat, barley, oats, and rye.

Q. Then the endogenous plants are the most interesting to man?

A. They are not the most showy, but they are the most useful.

Q. What is the meaning of exogenous?

A. Growing from the outside. The stems of these consist of wood and bark, and they increase in thickness by the formation of new matter between the wood and bark, part of which goes to the one and part to the other, the junction of those parts being always the vital or living part of the plant.

Q. What do they include?

A. All our ordinary forest-trees and shrubs.

Q. And are there not some of the endogenous plants that merit the name of trees?

A. Not in Britain. The largest that grow there are the reeds, the stems of which are annual, or die every year, and are followed by fresh ones the next; but many of them in warmer countries, such as palms and tree-ferns, obtain a great height, and last many years; and some of the reeds, such as the bamboo, are in those countries used as timber.

Q. What is the distribution of plants as to latitude?

A. Plants of all kinds are most numerous and grow to the largest size in the warm countries,—that is, on the low lands within the tropics, provided they have plenty of moisture; but the cryptogamous plants bear the greatest proportion to the whole in the cold regions.

Q. What is the proportion in Britain?

A. The proportion cannot be stated exactly for any place, as we are never sure that we know all the plants; but the known species in Britain are about four thousand.

Q. How many of them are cryptogamous?

A. At least the half, and rather more than one-fourth of the other half, that is, one-eighth of the whole are endogenous.

Q. What is their distribution?

A. The phenogamous plants are most numerous in the rich and warm parts of the country; and the cryptogamous in the cold and moist.

Q. Is there any distribution of plants as a mountain is ascended?

A. Yes, the ascent of a mountain bears some resemblance to a removal into colder latitudes; and the cryptogamous plants gradually increase in proportion to the others, as one ascends.

Q. Is that the case in all parts of the world?

A. To a great extent it is; but as the tops of mountains, though they may have the same average degree of cold as the polar countries, have not the same changes of seasons, the plants cannot have exactly the same characters.

Q. What are the differences of seasons between those places which are equally cold, the one from latitude, and the other from an elevation above the general surface of the globe?

A. The polar countries, though they have the winter exceedingly cold, have the summers warm; and in very high latitudes, the sun shines constantly for a number of weeks, so that there is heat to call forth several plants that cannot come to maturity on high mountains near the equator, where all the year is nearly equally cold.

Q. Is there any thing further?

A. In winter the plants in the polar regions are protected by a covering of snow, which falls early in the winter, and does not melt till the spring be far advanced: whereas, on lofty situations in tropical countries, it freezes at night and thaws during the day, all the year round.

Q. Has the difference of climate the same effect on sea as on land plants?

A. No. The sea is not subject to the same changes of temperature as the air, and therefore the plants that grow wholly in the water have a more extensive range.

Q. Is there any difference in the seas of different latitudes, in respect of plants?

A. Yes, the seas of the warmer latitudes contain a greater number of plants than those of the cold.

Q. What is the general name given to plants that grow in the water?

A. They are called *aquatic* plants.

Q. What are the principal distinctions of them?

A. Those that grow in the sea are called *marine* plants. If they are near the shore, and exposed in whole or in part, at low water, they are called *littoral* or shore plants; and if they grow in the deep water, they are called *pelagic*, or deep-sea plants.

Q. What are the distinctions of those that grow in fresh water?

A. If they grow in running water, they are called *fluvial*, or river plants; if they grow in marshes, they are called *palustrous* plants; and if in springs, or the rills that immediately issue from springs, they are called *fontinal* plants.

Q. What are the characters of *marine* plants?

A. Unless they be so high on the shore, as to be only occasionally covered by the water, they are all of the cryptogamous division, having neither flowers nor seeds: and they contain no part that can be considered as wood.

Q. Are these numerous?

A. There are more than fifty different genera on the shores of the British seas.

Q. Are they of any use?

A. A few of them are eaten as salads; some may be boiled into a kind of soup or jelly, and many are burned for the sake of the soda which they contain.

Q. What is the use of the soda?

A. Mixed with sand it forms common glass, and mixed with tallow it forms soap.

Q. How are the marine plants produced?

A. They are produced from *sporidæ* or little buds which are formed within the substance of the plant.

Q. How do they derive their nourishment?

A. They appear to derive it wholly from their surfaces, as their base is nothing but an attachment to the rock, and the substance of them does not form a mould when they decay, like the parts of land plants and of many of the fresh-water ones.

Q. What are the prevailing colours of sea-plants?

A. They are red, brown, or olive-green, in different shades.

Q. Are the fresh-water plants as numerous as the marine ones?

A. Not so much in Britain: there are not above half the number of genera.

Q. To what class do they belong?

A. Those that are constantly under water do not flower; but those that reach the surface often do. The former kind are generally soft in their texture, and in the form of threads. Many of them are very minute.

Q. How are they produced?

A. The grains are generally contained in little pipes, or tubes, and after they burst from these, they adhere to stones, posts in the water, and other substances, and become plants.

Q. What are the distinctions of land plants, as founded upon their general appearances?

A. There are six species of them: trees, small trees, shrubs, bushes, under shrubs, and herbs.

Q. What do you mean by a tree?

A. A plant which has a single woody stem, and attains the height of at least twenty feet.

Q. What do you mean by a small tree?

A. One which never, under any circumstances, attains the height of more than thirty feet.

Q. What by a shrub?

A. One which never attains the height of fifteen feet, and has branches near the bottom.

Q. What by a bush?

A. A low shrub much branched from the very surface of the ground.

Q. What by an under shrub?

A. A plant that has no buds, and is not more than two feet high.

Q. And what by an herb?

A. An herb, or herbaceous plant, has a soft stalk, not differing much from the leaves in consistency, and dying down every year.

Q. Have all the other five species woody stems?

A. They have.

CHAPTER III.

PRINCIPAL PARTS OF PLANTS.

Q. What are the principal parts of a plant?

A. Plants vary so much in their appearance and character, that before one can say what the parts are, one must know what kind of plant is meant.

Q. Well, suppose an exogenous plant, such as a tree, or shrub, what are the parts of that?

A. The root, stem, leaves, flowers, and fruit, are the essential parts, by which a tree exists till it produce other trees.

Q. What is the root?

A. The part of the plant which, generally speaking, is found in the earth.

Q. What purposes does it serve?

A. It keeps the plant steady in its place, and it puts out fibres which assist the plant in obtaining nourishment.

Q. What proofs have we of the power of these?

A. When trees are planted in a situation where they are more exposed on the one side than on the other, they always put out roots in such a way as to secure them from the danger.

Q. In what direction do they put them out?

A. Always toward the blast. A tree which grows on the bank of a precipice, against which the winds beat with violence, puts its roots down the steep, closely embracing the surface of the rock, and wedging its smaller fibres into the fissures.

Q. What proof have you that the roots assist the tree in obtaining nourishment?

A. The roots of trees have been known to take very singular directions, and run to very great distances, in order to reach a soil favourable for the tree.

Q. Is there anything remarkable about the fibres of roots?

A. Yes. Those shrubs which are natives of the poorest soils, generally put out the greatest number of small fibres in proportion to the whole size of the root.

Q. What are the principal forms of roots?

A. They are very many; but the more remarkable ones are fibrous, creeping, spindle-shaped, abrupt, tuberous, bulbous, and granulated.

Q. What is a fibrous root?

A. One which is made up of small threads; the nourishing roots of all plants, that is, the roots which draw nourishment from the soil, may be accounted fibrous, whether they proceed from the hollow of the stem, or from any prolongation of it under ground.

Q. What is a creeping root?

A. One which runs along under the ground, puts out its fibres, and sends up stalks at different distances.

Q. Which are some of the creeping rooted plants?

A. Many of the grasses, especially those that grow in dry and sandy soils. In warm countries there are trees called mangroves, that run along the sea shores, and form thickets absolutely in the water.

Q. What is meant by an abrupt root?

A. One in which the part of the stem which is under ground, ends thick and blunt.

Q. What is a tuberous root?

A. One in which large fleshy knots are found, as in the potatoe, or a bulb growing downwards, as in the turnip. These roots have the power of vegetating, or sending out stems, either from eyes, like those of the potatoe, or from the crown of the root, which in crowned tuberous roots, such as the turnip and carrot, is always the upper, or surface of the root.

Q. What is a spindle-shaped root?

A. That term applies to the mere form, and generally means those tuberous roots that are long, thicker at the middle than at either end, and form the crown uppermost.

Q. What do you mean by the crown?

A. That part of the plant, wherever it may be situated, below which all is root, and above which all is stem, or leaves of some description or other.

Q. What is a bulbous root?

A. A thickened root, which has the crown on the lower end, as in the onion or lily.

Q. What are the kinds of bulbous roots?

A. They are solid, or composed of coats or tunics, or made up of scales.

Q. Which are examples of these?

A. The crocus has a solid root; the onion has a coated one; and the lily has a scaly one.

Q. What is a granulated root?

A. One which is made up of little knots, each of which may be regarded as a small bulb.

Q. To what kind of plant do the bulbous and tuberous belong?

A. Exclusively, or nearly so to herbaceous plants, and the bulb or tuber, may be considered as a sort of magazine of provision for a future stem.

Q. In what countries are the tuber and the bulb most essential to plants?

A. In those countries where a certain portion of the year is unfit for vegetation.

Q. What is the cause of that unfitness?

A. Either too cold a season, or one that is too hot and dry; and consequently the winter in the cold latitudes, and the dry season in the tropical countries.

Q. Where is the last state of things the most remarkable?

A. Probably in Southern Africa, where, at certain seasons, the vegetation on the surface of the ground completely disappears, and the plants take shelter in their bulbs.

Q. Are there no plants in such countries but bulbous ones?

A. There are many of what are called *succulent* plants, that is, plants that have what may be considered as a sort of bulbs or scales, instead of stems and leaves.

Q. What is the character of these?

A. They have various characters; but they may be described as in general consisting of thick fleshy parts full of juice, which are defended from the heat by a very tough skin; and they resist the heat in the same manner as bulbs.

Q. How are roots classed as to their duration?

A. There are three distinctions from duration: annual, biennial, and perennial.

Q. What is meant by an annual root?

A. One which does not *hybernate*, or last the winter, either in a bulb or any other form, but bears its flower and fruit the same year that it issues from the seed, and then dies.

Q. And is a biennial root one which sends up a flower-stem twice?

A. No. A root which can send up two flowering stems is perennial either in itself as an individual root, or has the power of continuing itself by new roots. What is meant by a biennial root, is one which produces leaves the one year, and flowers the next; so that though it lasts part of two summers, it lasts for only one year.

Q. But you say that such roots have a power of reproducing?

A. In many cases they have. Some bulbs produce one or more fresh bulbs every year; and many fibrous roots die at the end which produced the stem and flowers of the year, but extend at the other one.

Q. To what plants do annual and biennial roots belong?

A. Exclusively to herbaceous plants.

Q. Is there any remarkable difference between the annual roots and others?

A. Yes. A plant which has a proper annual root, whether that root flower the same summer that it first grows, or not, can be continued in no other way but by sowing the seeds.

Q. What plants have perennial roots?

A. All woody plants, as well as some herbaceous ones.

Q. Have any woody plants bulbous roots?

A. They have no roots that can be properly called bulbous; but some of them form knots upon the roots which produce other plants of the same kind.

Q. Have they no means of preserving their vitality during winter?

A. In all wooded plants, except the under shrubs, there are buds in which the energy of the plant may be supposed to hybernate during the winter.

STEMS.

Q. What is understood by the stem of a plant?

A. A stem, properly so called, runs from the root, and bears leaves, flowers, and fruit.

Q. What are the principal forms or habits of stems?

A. The following are a few:—

Erect—standing straight up.

Procumbent—lying down.

Creeping—on the ground.

Reclining—bent towards the ground.

Climbing—by means of tendrils, as in the common vine and pea; or by means of fibres, as those by which ivy adheres to a rock, a wall, or a tree.

Twisting—when it coils itself round, like the honeysuckle or French bean.

Trailing—as in the runners of the strawberry; and

Branched—as in most trees and shrubs.

Q. Are there any names for those stalks that do not

bear both leaves and flowers, and therefore are not, properly speaking, stems?

A. Yes.

Culm, or straw, is the name of the stalks or the grasses.

Peduncle is the name given to those foot-stalks that bear only flowers. If they spring immediately from the root (*radix*), they are called radical; if from the stem (*caulis*), they are called cauline; and if from a branch (*ramus*), they are called ramose.

Q. Is not one kind of stalk called a *petiole?*

A. Yes, the foot-stalk of a leaf.

Q. Of what parts are stems composed?

A. The stems of woody plants, which in the large ones are called trunks or boles, are made up of four distinct parts.

Q. What are these?

A. They are—

The pith (*medulla*) in the centre, which is most abundant in young trees, and is sometimes obliterated in old ones.

The wood, which generally forms the chief part of the stem, and of which there is usually a ring formed every year.

The bark, which covers the wood, and also receives yearly additions.

The epidermis, which covers the whole in young trees, but is often wanting in very old ones.

Q. Is there no other part of the stem?

A. Between the bark and wood there is the *cambium* (changing matter), which is a fluid in the early

part of the season, but changes outwardly to bark, and inwardly to wood, by the end of it.

Q. Is there any other part?

A. The last-formed wood, and the last-formed bark, are softer than the older formations; and the first is called *alburnum*, or sap-wood, and the last *liber*.

Q. Is there any other name given to the stalks of plants?

A. When the same organ bears stem, leaf, and flower, it is called a *frond*[1]; and if any part of it has the appearance of being a petiole to the rest, that part is called a stipe. If the frond contain the *sporæ*, or germs, imbedded in its substance, it is called a *thallus*, as in the sea-weeds and many other cryptogamous plants.

LEAVES.

Q. What is a leaf?

A. That which expands from a bud or otherwise, does not bear a flower, answers a temporary purpose, and then drops off from the plant.

Q. What are the uses of leaves?

A. Their particular uses in contributing to the growth of the plant are not very well known; but they absorb, and probably also give out moisture, and they form carbonic acid, by giving out a portion of charcoal, which unites with the oxygen of the air.

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[1] Frond, Lat. *frons*, Gr. θαλλός; literally means "a *green* or *living* leaf." *Folium*, φύλλον, any leaf, green or withered, or any thing like a leaf. We have the English word leaf for *folium*; but we have no word for *frons* but the Anglicised "*frond*."

Q. What is the structure of leaves?

A. They are composed of a fibrous net-work of matter, more or less woody, which is improperly called the *veins* or *nerves*, and this supports a softer pulpy matter contained within an epidermis, which in many leaves may be peeled of; and if a ripe leaf be *macerated*, that is, soaked in water, the pulpy matter may be dissolved, and the net-work will remain in great beauty.

Q. Are leaves of any other use than to trees?

A. The number of small animals that feed upon leaves is immense. Leaves and stems form much of the food of domestic quadrupeds. When decayed they add to the fertility of the ground; and in some countries, where leaves grow very large, the people use them for covering their houses, and for various household purposes.

Q. What are the forms of leaves?

A. They are very many and varied; but the most general and obvious are those of simple and compound leaves.

Q. What is a simple leaf?

A. A leaf which has but one lobe or division, whatever may be its form.

Q. What is a compound leaf?

A. One which has a number of lobes or leaflets standing on the same foot-stalk, of which, as well as of the other, there are many varieties.

Q. Are not leaves divided into some classes according to their duration?

A. Yes, there are three principal kinds of leaves, considered in that respect.

Q. What are they?

A. They are,—

Fugitive, or those that fade soon after they appear.

Deciduous, or shed from the tree in the winter, and before the new leaves make their appearance.

Evergreen, or shed after the other leaves make their appearance, so that though the leaves are changed after a certain time, there are always green ones upon the plant.

FLOWERS.

Q. What is meant by a flower?

A. That part of a plant which is preparatory to the perfecting of seeds. Their variety is very great.

Q. What are the parts of a flower?

A. In those flowers which are considered as the most perfect, there are seven parts besides the peduncle on which the flower is supported.

Q. What are these?

A. They are,—

1. The *calyx*, or flower-cup, which is an extension of the peduncle in the form of leaves, and not differing much from common leaves in texture.

Q. Is it always present?

A. No, it is sometimes wanting, sometimes it falls off, sometimes it remains on the lower part of the trunk, and sometimes on the upper part in the form of a little crown.

Q. What is the second part?

A. The *corolla*, which is found within or above the calyx. It is of a finer texture, and often displays the most beautiful colours. It generally falls off when the preparation for the seeds of the flower is perfected.

Q. Is the corolla ever wanting?

A. In some flowers there is only one organ, which in those cases may be considered as the calyx and corolla united together, as it has the rough texture of the one on the outside and the delicate texture of the other within.

Q. When the corolla consists of more than one part, what are the parts called?

A. They are called petals. When there is only one row of them the flower is said to be single, and when more than one row it is double.

Q. What is the third part of the flower?

A. The stamens, which are thread-like substances, generally bearing little knobs on their points. They are ranged within the corolla, and vary in number in different flowers.

Q. Are these ever wanting?

A. They are never wanting to the species, but they are sometimes in a different flower from the other parts, and sometimes on a different plant.

Q. Which is the fourth part?

A. The pistils, which are organs standing on the rudiments of the fruit, sometimes one and sometimes many in the same flower.

Q. Are they ever wanting?

A. They are never wanting on those flowers which are to produce seeds, but the stamens are sometimes in other flowers or on other plants.

Q. Which is the fifth part?

A. The pericarpium or seed vessel; but sometimes it is wanting, in which case the plants are said to have naked seeds.

Q. Which is the sixth part?

A. The receptacle, or that by which all the other parts are united.

Q. Which is the seventh part?

A. The seed, the bringing of which to perfection, so that it may be fit for producing future plants, is the object of all the other parts; and when they have accomplished that, they die.

Q. Are not there some other parts?

A. The hollow of the corolla is sometimes prepared with glands or organs that secrete honey, and which are called the nectary.

FRUITS.

Q. What is meant by the fruits of plants?

A. The seeds with the vessels in which they are contained. They are almost as varied in their appearances and characters as flowers.

Q. Which are some of the principal ones?

A. One class is the seeds of the *cerealia*, or corn grasses, which are sometimes enveloped in a chaff and sometimes naked. They are chiefly composed of farina or meal; and are, of all vegetable substances, the best adapted for human food.

Q. Mention another class.

A. Nuts, in which the seed is contained within a coat or shell of various degrees of hardness. They are in general nourishing, but contain a quantity of oil which renders them less easy of digestion than the others.

Q. Are not some fruits called succulent?

A. Yes; those which have the seed, or seeds, enclosed in a fleshy or pulpy mass.

Q. Which are the principal kinds of them?

A. Stone fruits, in which the pulp incloses a single seed or nut; apples or pears, in which a few seeds are inclosed in a firm fleshy pulp; and berries, which are of smaller size, and have the pulp softer, and the seeds, generally speaking, more numerous.

CHAPTER IV.

CLASSIFICATION AND NAMES OF PLANTS.

Q. What is meant by the classification of plants?

A. Forming them into *classes*, which are the largest divisions; dividing these into *orders*; subdividing these orders into *genera*, the genera into *species*, and the species into *varieties*, when that is necessary.

Q. What must a class contain?

A. All the plants that are formed into one class must have at least one property or character in common, which does not belong to plants of any other class.

Q. What plants may belong to the same order?

A. They must have two common properties.

Q. What may belong to the same genus?

A. Those which have at least three common properties.

Q. Which to the same species?

A. Those that have all of what may be considered as their constant qualities alike.

Q. What form varieties of a species?

A. Those in which the differences appear to be merely accidental.

Q. What do you mean by accidental differences?

A. Those which are not natural to the plant, but which appear to be produced by difference of situation, climate, soil, or culture, and which would be changed by changing these.

Q. Among which plants are there the greatest number of varieties?

A. Among those which are the most extensively cultivated by man.

Q. Then you mean to say that the difference of species is a natural difference, and one species cannot be changed to another by any human art?

A. That is the meaning. There may be changes of varieties, and art often produces many new ones, but there can be no change of species,—no art of man can produce a new species of plant.

Q. Then the knowledge of species is the most important part of botanical knowledge?

A. Of course it is. The higher classification is matter of mere arrangement.

Q. Is it useless then?

A. Very far from it. The books in a library may be considered as species, as it is from them only that the student can get information; but he can get the book that he wants much sooner, if the whole are classed,—all the history in the same case, and all the works of the same historian on the same shelf.

Q. And the different editions of the same book are varieties?

A. As books are artificial things altogether, the term species does not properly apply to them.

Q. Is the knowledge of species easily obtained?

A. The species are very many, at least twenty thousand, or perhaps thirty thousand; and in plants which are not very well known, species and varieties are apt to be confounded with each other.

Q. Are there more kinds of classification than one?

A. The species which are nature's classification, are always the same, and the varieties are real also, although liable to change.

Q. Are not genera also natural divisions?

A. They ought always to be so; but that is not possible in all cases.

Q. Then what are the systems of arrangement that apply to the other parts of the classification?

A. They are either natural or artificial.

Q. What is a natural system?

A. One in which plants are arranged according to their general appearances and qualities, so that, from any one plant of the class, some idea at least may be formed of all the plants in it.

Q. What is an artificial system?

A. One in which the characters of plants are taken from some single part or quality, the knowledge of which is not always a key to the general habits, appearance, and qualities of the plant.

Q. What names are given to classes and orders?

A. The best ones are the names of the characters,

on which they are founded; these are not the names of single plants, but common names.

Q. What are the names of genera?

A. They are a sort of proper names—family names, as it were; and neither they nor the names of species, or individuals, are descriptive, but must be followed by a descriptive character.

Q. What are the proper names?

A. The generic name from the genus, the specific name from the species, and the trivial name from the variety.

Q. And what are the characters?

A. They are the same: a generic character, a specific character, and a trivial character.

Q. When are the names of plants the best?

A. When they either express or suggest the characters.

Q. When are they the worst?

A. When they have no meaning, as is but too often the case.

Q. What system of plants is the best?

A. The artificial system formed by Linnæus is the best for beginners, because it is the most simple.

CHAPTER V.

THE LINNÆAN SYSTEM.

Q. On what part of plants is the artificial system of Linnæus founded?

A. On the flowers solely.

Q. Is not that a disadvantage, as plants are not always in flower?

A. It is to those who search for new plants, and have not the means of waiting till they are in flower; but still it is the most simple.

Q. Does it convey the most information?

A. No artificial system can convey information; but the system of Linnæus is a very convenient arrangement of the information otherwise obtained.

Q. On what part of the flowers is the system founded?

A. On the essential parts—the *stamens* and *pistils.*

Q. Of what part does the stamen consist?

A. Of the *filament* or thread, and the *anther*, which is a little knob on the top of the filament, that bursts and discharges a fine powder, called the *pollen;* this powder falling on the stigma fertilizes the *embryo*, or rudiment of the seed.

Q. How many classes are there in the Linnæan system?

A. Twenty-four.

Q. How are they formed?

A. Their names are derived from the Greek: the first twelve are made up of the names of numbers, and the word *andria*, which means fertilizers, or the stamens; and the other twelve are named from the arrangement of the stamens.

Q. Repeat their names.

A. CLASSES.

1. Monandria	One Stamen
2. Diandria	Two Stamens

3. Triandria	Three Stamens
4. Tetrandria	Four Stamens
5. Pentandria	Five Stamens
6. Hexandria	Six Stamens
7. Heptandria	Seven Stamens
8. Octandria	Eight Stamens
9. Enneandria	Nine Stamens
10. Decandria	Ten Stamens
11. Dodecandria	Twelve Stamens
12. Icosandria	Twenty Stamens
13. Polyandria	Many Stamens
14. Didynamia	Four Stamens, two longer
15. Tetradynamia	Six Stamens, four longer
16. Monadelphia	Filaments united at bottom but separated at top.
17. Diadelphia	Filaments in two sets
18. Polyadelphia	Filaments in many sets
19. Syngenesia	Stamens united by antheræ
20. Gynandria	Stamens and pistils together
21. Monœcia	Stamens and pistils in separate flowers upon the same plant
22. Diœcia	Stamens and pistils distinct, upon different plants
23. Polygamia	Variously situated
24. Cryptogamia	Flowers invisible.

CHAPTER VI.

THE CLASSIFICATION OF PLANTS, *continued.*

Q. THE principles on which the classes are formed are certainly simple, and easily to be comprehended;

but it will be necessary for us to go over them again and distinguish the properties of each class more particularly before we proceed farther. Tell me, therefore, how the first ten classes are known.

A. All plants which have only one stamen are of the first class: those that have only two are of the second; those that have only three are of the third; and so on, the number of stamens being the same with the number of the class in the first ten classes.

Q. How is the eleventh class (Dodecandria) known?

A. The eleventh class contains all those plants which have from twelve to nineteen stamens fixed to the receptacle.

Q. How is the twelfth class (Icosandria known)?

A. By having twenty or more stamens fixed to the inside of the calyx. In this class the place of insertion is more to be relied on than the number of the stamens, for there are sometimes less than twenty, and sometimes more.

Q. What plants are comprehended in the thirteenth class (Polyandria)?

A. Those that have more than twenty stamens attached to the receptacle.

Q. What distinguishes the fourteenth class (Didynamia—*two powers)?*

A. When there are four stamens in a flower, of which two are longer than the others, it belongs to the fourteenth class.

Q. How may the fifteenth be known?

A. Tetradynamia *(four powers)*, the fifteenth class, is known by having six stamens in the flower, four of which are longer than the other two.

Q. Describe those of the sixteenth class (Monadelphia—*one brotherhood)*.

A. In the sixteenth class the stamens are united by their filaments into one set, forming a case round the lower part of the pistils, but separating at the top.

Q. How may the seventeenth class (Diadelphia—*two brotherhoods)* be distinguished?

A. In the seventeenth class the corollas are papilionaceous, or like a butterfly, as the blossom of a pea: the stamens are connected by their filaments, but divided into two sets, one of which is thicker, and forms a case round the pistil; the other is smaller, and leans towards the pistil.

Q. How is the eighteenth class known?

A. In the eighteenth class (Polyadelphia—*many brotherhoods)* the stamens are united by their filaments into more than two sets or parcels.

Q. By what means may the nineteenth class be known?

A. Syngenesia *(of like parts)*, the nineteenth class, consists of compound flowers, as the common daisy, or dandelion; and they are called compound because each single flower consists of a collection of little flowers or florets, attached to the same broad receptacle, and contained within one calyx.

Q. What distinguishes the twentieth class (Gynandria)?

A. In the twentieth class the stamens are attached to the pistil.

Q. By what may the twenty-first class be known?

A. The twenty-first class (Monœcia, *one house)* contains those plants, which have flowers of different

kinds on the same plant, some bearing pistils and others stamens only.

Q. How may the twenty-second class (Diœcia—*two houses*) be known?

A. The twenty-second class consists of those species which have stamens on one plant, and pistils on another.

Q. What kind of plants does the twenty-third class (Polygamia, *many unions*) comprehend?

A. The twenty-third class comprehends those plants which have at least two, and sometimes three kinds of flowers. 1. Some with pistils and stamens in the same flower. 2. Others having stamens only. 3. Or having flowers with pistils only.

Q. What are comprehended in the twenty-fourth class?

A. The twenty-fourth class (Cryptogamia—*concealed union*) comprehends all plants in which the flowers are invisible to the naked eye: as mosses, ferns, mushrooms, sea-weeds, &c.

CHAPTER VII.

OF THE ORDERS OF PLANTS.

Q. On what are the *Orders* founded?

A. The formation of the orders is as ingenious and simple as that of the classes. In the first thirteen classes, the orders are founded wholly on the number of the pistils: so that by adding *gynia* instead of *andria*, to the Greek words signifying the numbers, the

names are formed, and they may be easily recollected. Where they are not distinguished by the number of the pistils, their names are taken from some circumstances relative to the stamens, pistils, or seed.

Q. Name the first thirteen orders.

A. Monogynia..... 1 pistil
Digynia ..... 2 pistils
Trigynia..... 3 pistils
Tetragynia..... 4 pistils
Pentagynia..... 5 pistils
Hexagynia..... 6 pistils
Heptagynia ..... 7 pistils
Octagynia ..... 8 pistils
Enneagynia ..... 9 pistils
Decagynia .....10 pistils
Dodecagynia.....12 pistils
Polygynia .....many pistils,

Q. How many orders are there of the fourteenth class (Didynamia), and how are they known?

A. In the fourteenth class there are only two orders, which depend on the presence or absence of the pericarp or seed-vessel.

1. *Gymnospermia.* Naked seeds in the bottom of calyx; as in mint, dead nettle, and thyme.
2. *Angiospermia.* Seeds inclosed in a pericarp; as in the fox-glove, eye-bright, wood-flax, and fig-wort.

Q. What orders are there of the fifteenth class?

A. Two; which are taken from a difference in the form of the pericarp.

1. *Siliculosa.* Seeds enclosed in a silicule (pouch) or roundish seed-vessel, consisting of two pieces

called valves, and the seeds fixed to both edges, or sutures, as in Shepherd's purse and cress.

2. *Siliquosa.* Seeds enclosed in a silique, or long seed-vessel; as in mustard.

Q. How are the orders of the next four classes known?

A. In the classes *Monadelphia, Diadelphia, Polyadelphia,* and *Gynandria,* the orders are distinguished by the number of stamens: viz. *Pentandria,* five stamens; *Hexandria,* six stamens, &c.

Q. How many orders are there in the nineteenth class (Syngenesia)?

A. There are six orders in the nineteenth class, which are taken from the structure of the flower.

Q. Which is the first?

A. *Polygamia Æqualis;* having both stamens and pistils in the same floret; as in Dandelion, Thistle, &c.

Q. Which is the second?

A. *Polygamia Superflua;* when the flower is composed of two parts—a disk, or central part, and rays or petals projecting outwards: as in the Sun-flower, Tansy, Camomile, &c.

Q. Which is the third?

A. *Polygamia Frustanea;* the florets of the centre perfect or united; those of the margin without either stamens or pistils; as Bluebottles.

Q. The fourth?

A. *Polygamia Necessaria;* where the florets in the disk, though apparently perfect, are not really so, and therefore produce no perfect seed; but the fertility of the pistil-bearing florets in the ray compensates for the

deficiency of those in the centre of the flower; as in the Marygold.

Q. The fifth?

A. *Polygamia Segregata;* when each of the florets has a calyx, besides the common or general calyx of the flower.

Q. Which is the sixth?

A. *Monogamia;* when the flower is not compound, but single, and the anther united.

Q. From what are the orders formed in the next three classes?

A. In the classes *Gynandria*, *Monœcia*, and *Diœcia*, the orders are formed from the number, and other peculiarities of the stamens:

Monandria	1 stamen.
Diandria, &c.	2 stamens, &c.
Polyandria	7 stamens.
Monadelphia	stamens united into one set.
Polyadelphia	stamens united into different sets.
Gynandria	stamens upon the pistil.

Q. How many orders are comprised in the twenty-third class.

A. The twenty-third class (Polygamia) comprises three orders; namely, *Monœcia*, *Diœcia*, and *Triœcia*.

Q. How many orders has the last class (Cryptogamia)?

A. Four: Ferns, Mosses, Sea-weeds, and Fungi.

CHAPTER VIII.

CLASS I.—*Monandria.* (One Stamen.)

THIS CLASS HAS THREE ORDERS,

Monogynia, Digynia, and Polygynia.

Q. What examples can you furnish me with of the class Monandria?

A. Most of the plants belonging to this class are natives of India, such as ginger, Cardamoms, Arrow-root, and Turmeric; and they are remarkable for their spicy qualities.

Q. Are any of them used for food?

A. Yes, the Indian Arrow root. (*Maranta Arundinacea.*)

Q. Are any of them natives of Britain?

A. Yes, two of the first order and one of the second. Of the first, the *Hippuris*, or Mare's Tail, which grows in our muddy pools and ditches, and as it is easily procured, will serve for an example of *Order* 1.

Q. Describe it.

A. The *Hippuris*, or Mare's Tail, has neither calyx nor corolla. A single pistil denotes its order, and it has only one stamen, which grows upon the receptacle, terminated by an anther slightly divided, behind which is the pistil, with an awl-shaped stigma, tapering to a point. The stem is straight and jointed, and the leaves grow round the joints: at the base of each leaf is a flower, and it is seen in bloom in the month of May.

Q. Which is the other British plant of the first order?

A. Glass-wort, (*Salicornia Herbacea,*) which grows

abundantly on some of the shores of Kent. It is useful in making glass and soap.

Q. Describe some plant of this class belonging to *Order* 2.

A. The water Star-Wort (containing two pistils), which takes its name from its upper leaves making a star-shaped appearance, is to be met with in ditches and standing-water, and may be seen in blossom at any time between April and October.

Q. Where are plants of the third order found?

A. Only in New Holland.

CHAPTER IX.

Class II.—*Diandria.* (Two Stamens.)

THREE ORDERS,

Monogynia, Digynia, and Trigynia.

Q. With what examples can you furnish me in class Diandria?

A. The Privet (*Ligustrum*), being a shrub very common in our hedges and gardens, will serve to exemplify this class.

Q. Give me an account of it.

A. The Privet bears a white blossom, and generally flowers in June. It has a very small tubulated calyx of one leaf, its rim divided into four parts. The blossom is also of one petal, and funnel-shaped, with an expanded border, cut into four egg-shaped segments.

Q. Does not the Privet bear berries?

A. Yes; the seed-vessel is a black berry, contain-

ing but one cell, which encloses four seeds. These berries are useful to the dyers, as they give a durable green colour to silk or wool, by the addition of alum.

Q. Does not the common Jasmine (*Jasminum Officinale*) belong to class Diandria?

A. Yes; and as it is a most fragrant ornamental shrub, with which we are well acquainted, I will, if you please, describe it.

Q. Do so.

A. The common Jasmine is a native of India, but has long been cultivated in Europe. It is chiefly raised against walls, and it is interesting not only from the elegance of its foliage, but also from the number of beautiful white flowers with which it is adorned, which exhale a sweet odour, particularly after rain and in the night.

Q. What useful foreign spice belongs to this class?

A. Pepper: there are upward of sixty different species of pepper, and they are nearly all natives of the East and West Indies. Black Pepper (which belongs to the third order of this class) is a climbing plant, and grows spontaneously in the East Indies and in Cochin China. It is also cultivated at many other places, but in no part of Europe.

Q. Is not White Pepper a different species from the Black?

A. No: it was formerly thought so, but it is really nothing more than the ripe berries deprived of their skin by steeping them for a time in water, and then drying them in the sun.

Q. Is Cayenne Pepper produced from the same plant?

A. No; Cayenne Pepper is produced in the West Indies, from various species of the genus *Capsicum*.

CHAPTER X.

Class III.—*Triandria.*—(Three Stamens.)

THREE ORDERS,

Monogynia, Digynia, and Trigynia.

Q. How do you mean to illustrate the class Triandria?

A. By giving you an account of some of the various *Grasses* which are comprised in it. Though it may appear surprising, it is no less true, that every single blade of these apparently insignificant plants bears a distinct flower, perfect in all its parts, and only requires to be nicely viewed to excite our value and admiration.

Q. Are there not many varieties of grasses?

A. Yes; there are upwards of three hundred species. The general character of grasses may be thus described: the leaves furnish pasturage for cattle; the smaller seeds are food for birds, and the larger for man; but some are preferred to others: as fescue, for sheep; meadow-grass, for cows; canary, for small birds; oats and beans, for horses; rye, wheat, and barley, for man.

Q. Do they not furnish us with many valuable necessaries?

A. Yes; our most important articles of food and clothing are derived from them. Bread, meat, beer,

milk, butter, cheese, leather, and wool; and all the advantages produced from the use of cattle, would be lost without them.

Q. How may corn and grasses be distinguished from other plants?

A. By their simple, straight, unbranched stalk, hollow and jointed, commonly called a straw, with long, narrow, tapering leaves, placed at each knob or joint of the stalk, and sheathing or enclosing it as by way of support: their ears, or heads, consist of a husk, generally composed of two valves, which form the calyx; within which is the blossom, being also a husk of two valves.

Q. How are the various grasses divided?

A. Linnæus has arranged them into four divisions; the first three include those that are produced in panicles, or loose branches, which are distinguished by the number of flowers in each impalement; the first having one flower, the second two, and the third several. The fourth division consists of all those that grow in spikes or heads, such as Wheat, Rye, and Barley.

Q. Describe Wheat.

A. Wheat, the chief support of man, is cultivated in most civilized countries of the world, and is supposed to have been originally introduced into Europe from Asia *. There is no grain so valuable as this; and it is wisely ordained by Providence, that it is ca-

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* Osiris, son of Jupiter and Niobe, and king of Egypt, is fabled to have been the inventor of the art of agriculture,

pable of sustaining the severity of the northern climates, and the excessive heat of the torrid zone.

Q. Does it not constitute the principal food for all classes of the community in Britain?

A. Yes; and its abundance or scarcity regulates, in a great degree, the welfare and prosperity of the inhabitants. The whole annual consumption of grain in this island is said to amount to twenty-five millions of quarters; and in London alone, to more than 1,162,100 quarters, of which by far the greatest proportion is Wheat.

Q. Is not Sugar the produce of a plant belonging to this class?

A. Yes; the Sugar-cane (*Saccharum Officinarum*), a plant much cultivated in the East and West Indies, which has a jointed stem eight or nine feet high, long and flat leaves of a greenish yellow colour, and flowers in bunches.

Q. What methods are used to extract the sugar from the canes?

A. When cut down, the leaves are thrown away, and the stems or canes are divided into pieces, each about a yard in length; they are then tied up in bundles, and conveyed to the mill, where they are bruised between three upright wooden rollers co-

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and his wife Isis the discoverer of the use of wheat and barley.

"Then the far country waves with golden corn;
The soil untill'd a ready harvest yields,
With wheat and barley wave the golden fields."

HOMER'S ODYSSEY.

vered with iron. The *saccharine* juice which flows from them is conducted into a large vessel, and the quantity of juice prepared by some of these mills is upwards of ten thousand gallons in a day.

Q. What process does it afterwards undergo?

A. The juice is boiled in large cauldrons, and afterwards carefully drawn off, leaving the scum at the bottom of the pan. After being again boiled with a certain mixture of lime, to absorb the free acid, it is transferred into a large, shallow, wooden vessel, where, as it cools, it runs into a sort of *crystallization*, by which it is separated from the *molasses* or *treacle*, an impure part of the juice, incapable of being crystallized, but which is used for various useful purposes.

Q. Does not the celebrated plant called by the ancients *Papyrus* belong to this class?

A. Yes; the plant Papyrus [1] is of the rush kind, and grows on the borders of the Nile to the height of ten or twelve feet. The stem is naked, having a bushy head, and a few short leaves at the bottom.

Q. What part of this plant was converted into paper?

Saccharine, *a.* sweet, having the taste of sugar.
Crystallization, *s.* the process of congealing.

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[1] From *Papyrus*, the word *paper* is derived; and from the ancient custom of writing on the *leaves* of trees, books are said to be composed of leaves. The word *liber* signifies the inner bark of a tree, on which the ancients wrote; and *volumen* was the manuscript rolled up: thus are our words *library* and *volume* derived.

A. The inner rind of the stem. It was principally manufactured at Alexandria, and the city derived great riches from its exportation. This kind of paper was used in the days of Alexander the Great, and continued in use till about the tenth century, when paper made of cotton was introduced; and such as we now use, made from linen, became common in the fourteenth century.

CHAPTER XI.

Class IV.—*Tetrandria.* (Four Stamens.)

THREE ORDERS,

Monogynia, Digynia, Tetragynia.

Q. How are the flowers of the class Tetrandria characterized?

A. They are characterized by having four stamens.

Q. Give me some examples.

A. Teasel, Madder, and Holly.

Q. What is Teasel?

A. Teasel (*Dipsacus fullonum*) is a plant cultivated in several parts of England, and used in the dressing of woollen cloths. It is distinguished from other plants of the same tribe by having its leaves connected at the base, the flower scales hooked, and the general calyx reflexed or bent back.

Q. In what part of the dressing of cloth is it used?

A. In raising the nap that hides the threads.

Q. What is Holly?

A. Holly (*Ilex aquifolium*) is a small ever-green tree, with shining, irregular leaves, and white flowers,

which grow in clusters round the branches, and are succeeded by small red berries.

Q. What is the use of this plant?

A. As a fence, Holly is very serviceable, and it retains its beautiful green verdure through the severest winters. The *wood* is very close grained, and is used for many purposes. The leaves afford a grateful food to sheep and deer in winter; and the berries yield a subsistence to numerous birds. We use branches of Holly to decorate our houses and churches at Christmas, to give an air of spring in the depth of winter.

Q. Is not *bird-lime* made of the bark of the Holly?

A. Yes; and for that purpose it is boiled about twelve hours; and after standing for a fortnight, it is mixed over the fire with a third part of oil. The adhesive quality of bird-lime thus prepared is very remarkable, particularly to feathers and other dry substances; for which reason it is used for the smearing of twigs, to ensnare birds.

CHAPTER XII.

Class V.—*Pentandria.* (Five Stamens.)

SEVEN ORDERS,

Monogynia, Digynia, Trigynia, Tetragynia, Pentagynia, Decagynia, Polygynia.

Q. Give me some examples of this class.

A. It will be very easy to do so, for in the class Pentandria is comprised one-tenth of the vegetable world; and it includes many very agreeable flower

as well as noxious plants. The Primrose, Oxlip, Cowslip, and Polyanthus belong to it; and so does a tribe of plants called *Luridæ*, which is a name expressive of their noxious appearance and strong scent.

Q. Describe the Polyanthus.

A. The Polyanthus, so much admired and cultivated by florists for its variety and beauty, is derived from the Primrose; and is a pleasing instance of the improvement that art is capable of bestowing upon nature.

Q. How is it known?

A. By its calyx consisting of one leaf, tubular, sharp and upright; the blossom also tubular, and of one petal, with the border divided into five segments: the seed-vessel is a capsule enclosed in the calyx, containing only one cell; and the stigma is globular. The species is marked by a five-angled calyx, the wrinkled surface and indented edges of its leaves.

Q. How are those plants belonging to the tribe called *Luridæ* distinguished?

A. Besides having the characteristic marks of five stamens, and one petal, they coincide in a calyx that is permanent, and divided like the corolla, which consists of one petal, into five segments. Their seed-vessel is either a capsule or a berry, enclosed within the flower.

Q. Will you furnish me with an example?

A. Yes; I will first mention the Deadly Nightshade (*Atropa Belladonna*), as it is the most fatal of any in its effects. The leaves are egg-shaped and undivided, and the blossoms of a dingy purple. Woods, hedges, and gloomy lanes mostly conceal this dangerous

plant; and its bright, shining, black berries, have too frequently tempted children to partake of its dangerous poison.

Q. What are the names of the other poisonous plants belonging to this class?

A. The Thorn-apple (*Datura*); Henbane (*Hyoscyamus*), the smell of which is exceedingly disagreeable; and Nightshade (*Solanum*), which comprises two kinds, the Woody Nightshade, known by its blue blossoms and red berries; the Garden Nightshade, distinguished by its white blossoms and black berries.

Q. Is there no valuable plant in this class?

A. Yes; the potatoe (*Solanum tuberosum*), the egg plant (*Solanum melongena*), and the apple of Sodom (*Solanum Sodomeum*).

Q. Is it true that the last-named plant is fair on the outside, and like ashes within?

A. Sometimes it is, but the cause is a disease produced by the puncture of an insect.

Q. Does not the Passion Flower belong also to this class?

A. Yes; the common blue Passion Flower, which I shall describe, is a native of Brazil, and may be trained up to more than forty feet high. It is hardy enough, however, to grow in the open air, and is now very common in England.

Q. Whence did it derive its name?

A. From the fanciful resemblance of the different parts of the flower to the passion of Christ, which the Jesuits, who went as missionaries to South America, thus explained: The three pistils, they said, represented the three nails with which our Saviour

was nailed to the cross; the five stamina, the five wounds; and the radiant purple nectary, the rays that they supposed surrounded his head when expiring on the cross.

CHAPTER XIII.

Class VI.—*Hexandria.* (Six Stamens.)

FIVE ORDERS,

Monogynia, Digynia, Trigynia, Hexagynia, Polygynia.

Q. What kind of plants belong to the class Hexandria?

A. Our gardens receive many of their most splendid embellishments from flowers of this description. The gaudy Tulip, with its striped coat of various hues; the Hyacinth, of different colours and delightful fragrance; Lilies of every kind; the magnificent Amaryllis; and the great American Aloe, which rises to the height of twenty feet, and many other exotic plants of the liliaceous tribe, are comprised in this class.

Q. Do not many of our smaller garden flowers also belong to this class?

A. Yes; the modest Snowdrop, the golden Crocus, and the innocent and fragrant Lily of the Valley, with the Daffodil, Narcissus, and many others.

Q. Give me a botanical description of the Snowdrop.

A. The Snowdrop (*Galanthus nivalis*) is one of the earliest harbingers of spring. Its calyx is a sheath,

and the corolla is superior, consisting of six white petals, a little tinged with green, of which the three innermost are the shortest. This beautiful little flower never appears to more advantage than when it intermixes its blossoms with those of the golden Crocus, to which, in its manner of growth and external structure, it is nearly allied.

Q. Does not the Barberry belong to this class?

A. Yes; the Barberry is a shrub common in hedges, and bearing bright, red, heavy berries in autumn. When this coral-like fruit is ripe, it adds much to the beauty of shrubberies: but its acidity is so great, that even the birds refuse to eat it.

Q. Is there anything remarkable about the Barberry?

A. Yes; the filaments of the stamens are what is called sensitive.

Q. What does that mean?

A. In the ordinary state of the flower, the anthers of the stamens are enclosed in the petals of the corolla; but if the filaments be touched at their junction with the receptacle, they close together upon the pistil; and this power of motion continues after the flower has been pulled.

CHAPTER XIV.

Class VII.—*Heptandria.* (Seven Stamens.)

FOUR ORDERS,

Monogynia, Digynia, Tetragynia, Heptagynia.

Q. Are there many plants of that class?

A. Very few; and only one of them, Chickweed, mountain green *(Trientalis Europea)*, is a native of Britain.

Q. What sort of plant is it?

A. A beautiful mountain plant, with snow-white flowers.

Q. Are not some other plants of the class cultivated in Britain?

A. Yes.

Q. What example will you give of these?

A. The Horse-chestnut *(Æsculus Hippocastanum)*, which is a very common tree in parks and pleasure-grounds, bearing elegant clusters of flowers in the form of pyramids, and is certainly one of the finest trees of British growth. Its fruit, which is contained in prickly husks, has been found of considerable service in fattening cattle.

Q. What are its botanical characters?

A. A small calyx, of one leaf, slightly divided at the top into five segments, and swelling at the base; a corolla of five petals, inserted into the calyx, and a capsule of three cells, in one or two of which only is a seed.

CHAPTER XV.

Class VIII.—*Octandria.* (Eight Stamens.)

FOUR ORDERS,

Monogynia, Digynia, Trigynia, Tetragynia.

Q. What kind of plants are comprised in this class?

A. They are mostly either shrubs or herbaceous plants.

Q. Are many of them natives of England?

A. Not very many genera.

Q. Which are some of the genera?

A. The heaths (*ericeæ*) form the most numerous genus, containing more than three hundred and twenty distinct species, a few of which cover the mountains and elevated parts of Europe; but by far the greater part are from the Cape of Good Hope.

Q. Are any of them beautiful?

A. Many of the Cape heaths are very beautiful small shrubs; and the blossoms of the European ones furnish bees with a great deal of honey.

Q. Is there any other numerous genus?

A. The vacciniums, which comprise the mountain berries, such as whortle-berries and cranberries.

Q. What are their characters?

A. They are evergreen under-shrubs, remarkably hardy.

Q. Do not many of them furnish gums and resins which are valuable?

A. Yes, the genus Amyris, the species of which

are handsome shrubs, and natives of the warm parts of the world.

Q. Are there any valuable fruits among them except the vacciniums?

A. There are many. The most singular of which is the Akee of Africa, which has a pear-shaped fruit enclosing a substance like cream or butter.

Q. Which is the most remarkable British genus?

A. Probably the willow herb (*epilobium*), which grows in fields and hedges, has the shoots eatable, can be fermented into a beverage, and has a down on the seeds that may be spun, mixed with cotton.

CHAPTER XVI.

Class IX.—*Enneandria.* (Nine Stamens.)

THREE ORDERS,

Monogynia, Trigynia, Hexagynia.

Q. What examples can you furnish in this class?

A. The genus *laurus,* the laurels, which include Cinnamon, Cassia, Sassafras, Bay, Camphor, and many others.

Q. What other genera?

A. *Anacardium,* the Cashew-nut, with the different species of rhubarb and some others.

Q. Are there many British plants in the order?

A. There is only one plant that belongs to it growing wild in this country, which is the Flowering Rush (*Butomus umbellatus*).

Q. Describe it.

A. The Flowering Rush grows in the water.

has a round smooth stalk, which rises from one to six feet high, according to its situation; at the top of which is a head of bright red flowers, sometimes not less than thirty: three short leaves form the cup, and the corolla has six petals. This plant, so stately from its height, and its beautiful tuft of flowers, would make a charming appearance in canals or other pieces of water, and it is so hardy as to defy the severest frost.

Q. Is there any thing remarkable about this class?

A. All the plants that belong to it are permanent.

CHAPTER XVII.

Class X.—*Decandria.* (Ten Stamens.)

FIVE ORDERS,

Digynia, Trigynia, Tetragynia, Pentagynia, Decagynia.

Q. What kind of plants does this class comprise?

A. In the class Decandria are comprised several trees of foreign growth, as well as various plants and flowers common in this country. The Lignum-Vitæ-tree, Logwood, and Mahogany, all natives of the tropical countries, each belong to this class.

Q. What well-known flowers belong to it?

A. The rich Carnation, the modest Sweet William, and the whole tribe of Pinks.

Q. Is that a numerous genus?

A. There are more than forty species, and the varieties are almost without number.

Q. Are not there some remarkable shrubs that belong to it?

A. One very numerous genus is *melastoma*, of which there are nearly one hundred and twenty species in the warm parts of the world.

Q. Why are they called *melastoma ?*

A. Because the berries blacken the mouths of those that eat them.

Q. But those are not all shrubs ?

A. No; there are some trees, and some under-shrubs. They occupy the same place on the mountains of South America, that the vacciniums do on those of Europe.

Q. What are the shrubs then ?

A. Those which are planted in bog earth, and so ornamental to gardens : Rhododendron, Arbutus, Andromeda, Kalmia, Ledum, Hydrangia, and many others.

Q. Does Azelia, with its bright yellow flowers, belong to the same class ?

A. No; it belongs to pentandria, and so does the beautiful family *Epacrideæ*, which occupy nearly the same places in New Holland, that the heaths occupy in other parts of the world.

Q. Are there many other numerous genera ?

A. There are the Saxifrages, the stone-crops, the campions, the catchflies, and a number of others.

Q. Is there not a plant belonging to this class which exhibits a very curious instance of vegetable irritability ?

A. Yes; it is called the Fly-trap of Venus, and is a native of America.

Q. Give a description of it.

A. At the bottom of the footstalk of this curious

plant are several leaves, each of which are divided into two lobes at the extremity, having long teeth on the margin like the *antennæ* of insects, and armed within with six spines: these lie spread upon the ground round the stem, and are so irritable, that when a fly happens to light upon a leaf, it immediately folds up and crushes it to death.

Q. Describe the tree from which the wood called Mahogany comes.

A. The Mahogany tree *(Swetiena Mahogoni)* is of large dimensions, with winged leaves and small white flowers; its branches are numerous and spreading; its leaves are alternate and winged, with four or five pairs of leaflets, somewhat spear-shaped. It grows in Tropical America, and the West India Islands, and there are species in Africa, and the East Indies.

Q. Has not the cutting of mahogany been a source of considerable profit to the British settlers at Honduras?

A. Yes; in some instances the profit attending it has been very great. Messrs. Broadwood of London, the musical-instrument makers, once gave three thousand pounds for three logs, all cut out of the same tree.

Q. Does the tree grow fast or slow?

A. Rather slowly; and as the settlers cut down the trees, but never think of planting any, the supply must in time be exhausted.

Antennæ, *s.* the feelers.—See *Catechism of Entomology.*

CHAPTER XVIII.

CLASS XI.—*Dodecandria*[1]. (Twelve Stamens.)

SIX ORDERS,

Digynia, Trigynia, Tetragynia, Pentagynia, Dodecagynia, Polygynia.

Q. Give us an example of this class.

A. I know of no one more valuable or interesting than *Weld*, or Dyers' Weed, which is found on barren ground, or on walls; and in the cloth-manufacturing counties of England is cultivated to a considerable extent. Its leaves are spear-shaped and entire, with a tooth-like process on each side of the base. The flowers are yellow and in long spikes; and the calyx is divided into four segments.

Q. For what is it useful?

A. It affords a most beautiful yellow dye for cotton, woollen, silk, or linen, which is procured from its roots and stems; and blue cloths dipped in a decoction of it become green. It is said that the ancient Britons used it to stain their bodies with.

Q. Which are some of the other genera?

A. The Mangosteen, *Garcinia Mangostana*, a native of the East India Islands, and the finest fruit that grows.

Q. Is there any numerous genus?

A. The *Euphorbeæ*, or spurges.

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[1] Although the word *Dodecandria* implies twelve stamens, yet this class includes such plants as have from twelve to nineteen.

Q. What sort of plants are they?

A. They are plants that contain a milky juice, and some of them which are natives of very dry and warm countries are without leaves. There are more than one hundred and fifty species.

Q. Does not the houseleek which grows on the tops of houses belong to the class?

A. It does.

CHAPTER XIX.

CLASS XII.—*Icosandria.* (Twenty Stamens attached to calyx.)

FIVE ORDERS,

Monogynia, Digynia, Trigynia, Pentagynia, Polygynia.

Q. What plants belong to the class Icosandria?

A. A great variety of fruit-trees, such as the Apple, Pear, Cherry, Plum, Nectarine, Peach, Almond, and Medlar. Also various shrubs and herbs; such as Myrtles, Roses, Strawberries, and others.

Q. Is there any thing worthy of remark about any of the myrtles?

A. They are all beautiful plants; but one, the Pimento, or Jamaica-Pepper Myrtle, furnishes a valuable spice in great abundance.

Q. In what situation does it grow?

A. Upon the mountains, and it can hardly be cultivated.

Q. Are there any very numerous genera?

A. There are two, which contain a great number of species, and are at the same time very numerous.

Q. What are they?

A. *Cactus* or Indian fig; and *Mesembryanthemum* or fig Marygold.

Q. What countries do the cacti inhabit?

A. The warm parts of Asia and America. They are succulent plants, enduring the greatest drought. Some of them bear beautiful flowers, and others good fruit; but the plants themselves are not like either leaves or stems, they are lumps of matter often covered with prickles. One of them feeds the cochineal insect that furnishes the fine scarlet dye.

Q. Of what place are the Mesembryanthemums natives?

A. Chiefly of the Cape of Good Hope, though there are some species natives of the very warm and dry parts of Europe.

Q. What are their characters?

A. Some of them resemble the houseleek, only they are thicker and handsomer in their leaves.

CHAPTER XX.

CLASS XIII.—*Polyandria.* (Stamens numerous and indefinite, attached to receptacle.)

SIX ORDERS,

Monogynia, Digynia, Trigynia, Tetragynia, Pentagynia, Polygynia.

Q. What examples will you give me in this class?

A. The Poppy and the Tea-tree; the former being the plant from which opium and laudanum are produced; and the latter affording us a beverage which is now drunk by all classes in Britain.

Q. From what part of the plant is opium produced?

A. From the seed vessels, in which several gashes are made, and a milky fluid exudes, which when it attains sufficient consistence, is formed into balls or cakes, and is of a dark brown colour. Its uses in medicine, to cause sleep, and alleviate pain, are well known. Laudanum is a liquid preparation from opium and spirits of wine, and is used for the same purposes.

Q. Describe the Tea-tree.

A. The Tea-tree is an evergreen shrub, about five or six feet high, and much branched; a native of China and Japan. It flourishes, with great luxuriance, in valleys, on the sloping sides of hills, and on the banks of rivers. The leaves are narrow and tapering: the flowers are not much unlike those of the wild-rose, but smaller, and are succeeded by a fruit about the size of a sloe, containing two or three seeds. It is chiefly cultivated in the mildest and most temperate parts of China [1].

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[1] The Tea is gathered at three separate times: the tenderest leaves, of but a few days' growth, are gathered in February or March; the second gathering is in April; and the third in June, when the leaves are full grown. The Tea is afterwards prepared by drying it in a stove, in shallow iron pans; and the supposition of its ever being dried in copper, to give a more beautiful green to the leaves, seems to be entirely void of foundation. Tea was first introduced into Europe by the Dutch East-India Company, in 1641, and a small quantity was brought to England from Holland about the year 1666: it was for many years after drunk only by people of fashion, but during the last century it became general.

Q. Which are some other of the class ?

M. Magnolia, one of which is the most beautiful and fragrant of flowering shrubs ; Anemone and Ranunculus, including the common Butter-cup.

CHAPTER XXI.

CLASS. XIV.—*Didynamia.* (Four Stamens, two long and two short.)

TWO ORDERS,

Gymnospermia, the seeds naked ; *Angiospermia,* the seeds with a covering.

Q. What sort of plants are comprehended in this class ?

A. Many which are distinguished by us as garden herbs, and valued for their odoriferous smell and kitchen uses, as well as for the medicinal qualities which some of them possess.

Q. Mention one as an example.

A. Common or Spear Mint *(Mentha Viridis),* one of our most common garden herbs ; it is a native British plant, and grows wild in watery places, and near the banks of rivers, in several parts of England.

Q. Are there any beautiful flowers belonging to the class ?

A. Bignonia, the Trumpet-flower.

CHAPTER XXII.

CLASS XV.—*Tetradynamia.* (Six Stamens, four long and two short.)

TWO ORDERS,

Siliculosæ, Siliquosæ.

Q. What kind of plants compose this class?

A. The plants in this class are all eatable, and generally supposed to possess anti-scorbutic qualities. In it we find the Cabbage, Turnip, Water-cress, Mustard, and a variety of wild plants and flowers.

Q. Give a description of Mustard.

A. Common Mustard is made from the powdered seeds of a plant (*Sinapis nigra*), which grows wild in corn-fields, and by road sides, in most parts of England; and is known by its yellow cruciform flowers, with expanding calyx, and its pods being smooth, square, and close to the stem.

Q. Is it not cultivated by us?

A. Yes; in light lands it is cultivated to great advantage, particularly in the county of Durham, and that which is produced there is considered the best.

CHAPTER XXIII.

CLASS XVI.—*Monadelphia.* (All the Filaments united at the bottom, but separate at the top.)

EIGHT ORDERS,

Triandria, Pentandria, Heptandria, Octandria, Decandria, Endecandria, Dodecandria, Polyandria.

Q. Give me an example in this class.

A. I know of none more interesting or useful than

the Cotton Plant, which is cultivated in the East and West Indies, and numerous other hot countries. It grows to a considerable height, and has leaves of a bright green colour, with flowers of only one petal, of a pale yellow colour, with five red spots at the bottom. The seed-vessels, or cotton pods, contain a soft vegetable down, which envelopes the seeds.

Q. Is not the cloth we call cotton made from this down?

A. Yes; and after being gathered, and carefully separated from the seeds, it is packed in bags, and imported into this country. Here it undergoes the process of carding, spinning, and weaving, which were formerly performed by hand, but is now, for the sake of expedition, effected by machinery.

Q. Are there any beautiful plants in the order?

A. *Camellia*, of which Camellia Japonica wants only scent to make it the very finest of ornamental plants.

CHAPTER XXIV.

CLASS XVII.—*Diadelphia.* (Filaments united in two Sets.)

FOUR ORDERS,

Pentandria, Hexandria, Octandria, Decandria.

Q. What examples can you furnish me with under the head Diadelphia?

A. Many plants well known to us are comprehended in it; such as Peas, Beans, Vetches, Clover, Lucern, Broom, Furze, &c.; but a description of one of them, I imagine, will be sufficient; they are called papilionaceous.

Q. Well, then, describe the broom.

A. The common Broom is a shrub seen on sandy heaths in most parts of England; it has large yellow butterfly-shaped flowers, with leaves in threes, and the branches are without prickles.

Q. What curious sensitive plant belongs to the class Diadelphia?

A. The *Sensitive Hedysarum*, a native of Bengal, may be considered as one of the most extraordinary plants in the vegetable world. When the air is very warm, and quite still, its leaves are in continual motion, some rising, others falling, and others turning round by twisting their stems; the cause of this phenomenon is not at all accounted for.

Q. What kind of plant is it in appearance?

A. It grows about three feet high; the leaves are of a bright green, and the flowers of a pale red, slightly tinged with blue or yellow.

Q. Have not the flowers of this order a peculiar form?

A. Yes; they have something the form of butterflies, and on that account they are called papilionaceous.

CHAPTER XXV.

CLASS XVIII.—*Polyadelphia.* (The Filaments united, making many Sets.)

FOUR ORDERS,

Decandria, Dodecandria, Icosandria, Polyandria.

Q. What description of plants are arranged in this class?

A. Several foreign fruit trees, such as the Orange, the Lemon, the Citron, and the Cocoa-nut trees.

Q. Describe the Orange and Lemon trees.

A. The Orange and Lemon shrubs are evergreen plants. The latter has large and slightly indented shining leaves, of somewhat oval shape but pointed; the flowers are large and white, but of a purplish hue on the outside of the petals. The Orange tree is distinguished from the Lemon, by having a kind of winged appendage on the leaf stalks, of which the latter is destitute.

Q. Are there any other fine fruits belonging to this class?

A. The Durion, a native of the eastern isles, which with a rough exterior and an offensive smell, is one of the most wholesome and refreshing of fruits.

CHAPTER XXVI.

CLASS XIX.—*Syngenesia.* (Stamens united by Antheræ; Flower compounded.)

FIVE ORDERS,

Æqualis, Superflua, Frustanea, Necessaria, Segregata.

Q. Describe some plant under the class Syngenesia.

A. As I mentioned the Daisy and Dandelion as examples of this class, in the sixth chapter, I will describe the one you prefer.

Q. Then I think the beauty of the humble Daisy justly entitles it to my preference.

A. The Daisy, which so delightfully enamels every

meadow, will not be disregarded by the botanist, if taken separately; for there is much beauty and variety discernible in this little flower.

Q. Are the plants of that order numerous?

A. They are very much so.

Q. Which are some of the most handsome as flowers?

A. *Aster* and *Chrysanthemum*, but very many of the British genera are troublesome as weeds.

CHAPTER XXVII.

CLASS XX.—*Gynandria*. (Stamens situated on the Pistils.)

SEVEN ORDERS,

Named from the number of Stamens from one to eight, seven being wanting.

Q. What plants are comprised in this class?

A. Several well-known field plants of the orchis tribe.

Q. Describe them generally.

A. They have an oblong withered germ, below the flower, which has no proper calyx, but only a sheath; the corolla consists of five petals, the two innermost of which usually join to form an arch or helmet over the top of a flower. In some species the root is composed of a pair of solid bulbs; in others it consists of a set of oblong fleshy substances, tapering toward the ends.

Q. Are they handsome plants?

A. Some of those from the Cape and from South America are remarkably so.

Q. Does not that beautiful and scarce flower called the Ladies' Slipper belong to this class?

A. Yes.

CHAPTER XXVIII.

CLASS XXI.—*Monœcia.* (Stamens and Pistil in separate Flowers, but upon the same plant.)

NINE ORDERS,

The first six named from the number of Stamens, the others *Polyandria, Monadelphia,* and *Gynandria.*

Q. Mention some of the plants comprised in this class.

A. There are a variety of trees and plants, both native and foreign, that belong to it. Among those of native growth may be reckoned the Oak, Birch, Alder, Beech, Walnut, Sweet Chestnut, Fir, Hazel-nut, Filbert, and Mulberry trees; and the numerous kinds of Sedges. In the list of foreign plants may be noticed, the Bread-fruit tree, the Cork, Oak, the Cocoa-nut tree, the Tallow-tree, Maize, or Indian Corn, and many others.

Q. Give an example of one of the most interesting among those of British growth.

A. That is the Oak, which is a well-known timber tree, invaluable to us, for to it the British navy is indebted for its existence. Until the introduction of Mahogany, Oak-timber was very generally used for furniture, but it is now chiefly consumed in ship-building. The tree is remarkable for the slowness of its

growth, for its great longevity, and the dimensions to which it attains.

Q. Is not the bark of Oak very useful ?

A. Yes; it is used in the tanning of leather.

Q. Has not the Mulberry some important uses besides its fruit ?

A. Yes; the leaves of the White Mulberry form the principal food of the silk-worm.

Q. Where is the Bread-fruit tree cultivated ?

A. In the Sandwich Islands, where the fruit is eaten as bread. It is also a native of many islands in the East Indies, but is not there much cultivated.

Q. Describe the tree and its fruit.

A. The bread-fruit tree is about the size of a middling Oak, and the fruit is of the size and shape of a child's head, growing on boughs like apples, with a thick and hard rind. When ripe, the fruit is yellow and soft, with a sweet and pleasant taste. It is, however, gathered green, baked in an oven, and the outside black crust being scraped off, there remains a tender thin crust; but the inside is soft and as white as snow, having somewhat the consistence of new bread.

Q. Has not this tree another useful property ?

A. Yes, it has; for the inner rind of the young bark is manufactured into a kind of cloth, and worn by the natives.

Q. Describe the Cork-tree.

A. The Cork-tree grows in Spain and Portugal, and is a species of the Oak; the external part is of a fungous texture, which, when stripped off, is that elastic substance we call cork, so serviceable for stopping bottles and other purposes.

Q. Is not the Monœcia an important Order?

A. It is; the most valuable trees in the forest belong to it.

Q. Which are the most abundant?

A. Probably the fir tribe, which appear to cover a greater extent of surface than any other trees.

Q. Do any fruits belong to it?

A. Yes; the Gourd, the Cucumber, and the Melon.

Q. Are there any plants used for food in the class?

A. Yes; the root of a species of Jatropha furnishes the Indians of South America with bread.

CHAPTER XXIX.

CLASS XXII.—*Diœcia.* (Stamens and Pistils distinct upon different plants.)

FOURTEEN ORDERS,

Monandria, Diandria, Triandria, Tetrandria, Pentandria, Hexandria, Octandria, Enneandria, Decandria, Dodecandria, Icosandria, Polyandria, Monadelphia, Gynandria.

Q. Give me an example of some plant comprehended in this class.

A. As there are many varieties of the Willow every where to be met with, all of which belong to this class, I will describe the one most remarkable for its singularity, which is the round-leafed Willow. Its leaves are smooth, entire, and egg-shaped; the upper surface is green and wrinkled; the under one bluish, and covered with a net-work of veins, which are at first red, but afterwards become green. It is

but a low shrub, and produces both flowers and leaves from the same bud.

Q. But are there not other plants belonging to this class equally well known to us?

A. Yes; the parasitical Mistletoe, the Yew-tree, and Hemp, belong to the twenty-second class.

Q. Why do you call the Mistletoe *parasitical?*

A. All plants that grow upon others are termed parasitical, and the Mistletoe is one of them. Instead of rooting and growing in the earth, it fixes itself into the branches of a tree, where it spreads and forms a bush. It is commonly found on apple trees, producing a number of white berries, of a sweetish taste.

Q. Was not this plant regarded with superstitious reverence by the Ancient Britons?

A. Yes; it was always held sacred by them; but now it only retains a place at Christmas, to ornament our houses, and enliven the cheerless season of winter.

Q. Does not the Yew-tree bring to our mind recollections of past times.

A. Certainly; before the invention of gun-powder the archers' bows were made of yew, and the English were ever famous for their superior skill in archery.

Q. Do not the Junipers belong to the same class?

A. Yes; they are nearly allied to the yew.

Q. Is not there a diœcious plant which resembles some of the pines?

A. Yes, the Araucaria, which holds the same place

on the mountains of South America as the pines do in the northern parts of the world.

Q. Is there not a fine spice belonging to this class?

A. Yes; the Nutmeg, one of the very finest of spices. It grows in the Asiatic islands.

Q. Do any valuable fruits belong to this class?

A. Yes; the Date-palm, the fruit of which forms the principal food of the people in the sandy parts of northern Africa and the adjoining parts of Asia.

CHAPTER XXX.

CLASS XXIII.—*Polygamia.* (Stamens and Pistils variously situated.)

TWO ORDERS,

Monœcia, Diœcia.

Q. Describe some plant of this class.

A. The plantain-tree grows to the height of about twenty feet, with several leaves on the summit, many of which are eight feet long and two feet broad, but remarkably thin and tender. The fruit is of a pale yellow colour, and is produced in bunches so large as to weigh about forty pounds.

Q. In what way is this plant so serviceable?

A. The fruit is, to the negroes, what bread is to us.

Q. Are there any other important plants in the class?

A. Yes, the Fig-tree, the beautiful acacias, some of which furnish gum Arabic, the maples, the mimo-

sas, including the sensitive plant, and a number of others.

Q. Are many of the order natives of Britain ?

A. Very few; they are chiefly natives of warm countries.

CHAPTER XXXI.

Class XXIV.—*Cryptogamia.* (Flowers obscure.)

FIVE ORDERS,

Ferns, Liver-worts, Mosses, Flags, Fungi.

Q. We are now come to the last class, which I believe you said comprehended all plants in which the flowers are not easily seen, such as mosses, ferns, fungi, &c.

A. I did; and among the latter Mushrooms are of course included. The common Mushroom is a fungus consisting of white stalk, and a convex cover of white or brownish colour, which has, beneath, an irregular arrangement of gills of a pink hue when young, but afterwards of a dark liver colour. When it first appears above the ground, a Mushroom is smooth, and nearly globular, and in this state it is called a *button.*

Q. Ought not great caution to be used in selecting them ?

A. Certainly; for though several of them are *edible,* many are extremely poisonous.

Q. Does not the Rein-deer Moss belong to this class ?

A. Yes; all mosses come under the general term *Cryptogamia.* The Rein-deer Moss is an invaluable

plant to the poor Laplanders, inasmuch as it not only wholly sustains their favourite animals, to which they owe their greatest comforts, but they use it as a soft and easy bed for their new-born infants.

Q. Are any plants of this order fit for food?

A. The Iceland Moss (*Citraria Icelandica*), in particular, is esculent; and no doubt many others would be so.

Q. How is it dressed?

A. Boiled till it forms a jelly.

Q. Did Linnæus form an appendix to his system?

A. He did of the palms, which were not at that time very well understood: but they now take their places in the different orders to which they belong.

THE END.

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