CHAPTER XII

Corolla.—Nectary.

271. The term corolla, or corol, is derived from the Latin *corolla*, a little crown or chaplet. As the calyx is formed by a continuation of the fibres of the outer bark, the corolla is a continuation of the cellular integument, or inner coat of the same. The texture of the corolla is delicate, soft, watery, and coloured. The cuticle, or outward covering, of the corolla is of an extremely fine texture. The rich and variegated colours of flowers, are owing to the delicate organization of the corolla; and to this cause, its transient duration may also be attributed.

272. The corolla exhibits every variety of colour, except black; florists sometimes present us with what they term black roses, and we see some other flowers which approach this colour, yet none are perfectly black; the darkest being but a very deep shade of purple. Corollas are white, yellow, blue, violet, &c.; in some, different colours are delicately shaded and blended; in others, they meet abruptly, without any intermediate tint.

273. The corolla, before blossoming, is folded in the calyx, as the leaves are within the scales of the leaf-bud, and the whole is then called the flower-bud.

274. In most cases, the calyx and corolla are so distinctly marked, that it is perfectly easy to distinguish them. The colour usually constitutes a very striking mark of difference; the calyx being ordinarily green, and the corolla of a more lively hue, but the colour is not always a criterion. In some cases, the calyx is beautifully coloured.

275. Each simple part, of which the corolla is composed, is called a *petal*. A flower with petals is said to be *petalous*, without petals, *apetalous*. The petals are *definite*, when their number is not more than twenty; *indefinite* when they exceed that number.

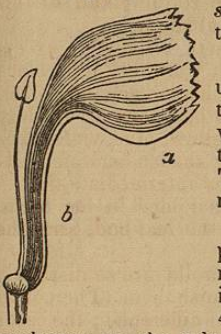
276. If the corolla is formed of one single piece, or petal, it is *monopetalous*, if of more than one, it is *polypetalous*. You

271. What is the corolla?
272. What is observed of the various colours of the corolla?
273. Where is the corolla before blossoming?
274. How are the calyx and corolla distinguished
275. What is said of the divisions of the corolla, and the terms which express them?
276. What is meant by the terms monopetalous and polypetalous?

may sometimes find a difficulty in determining whether the corolla is in one piece or more; for monopetalous flowers often have deep divisions, extending almost to the base of the corolla; but a corolla must be divided at the base, or be in separate pieces, in order to be considered as *polypetalous*. It is a good rule to consider the parts into which a corolla naturally falls, as so many petals.

277. *Monopetalous corollas* (see Fig. 44,) consists of the *tube*, *throat*, and *limb*. The *tube*, is the lower part, having more or less the form of a tunnel. The *throat* is the entrance into the tube; it is either open, or closed by scales or hairs. The *limb* is the upper border of the corolla.

Fig. 43.



278. *Polypetalous corollas* consist of *several petals*. Each petal consists of two parts, the *lamina* and *claw*.

279. The *lamina*, (Fig. 43, *a*) is the upper and usually thinner part of the petal; its margin is sometimes *entire*, or without divisions, as in the Rose; sometimes notched, or *crenate*, as in the Pink. The lamina corresponds to the limb of monopetalous corollas.

280. The *claw* (Fig. 43, *b*,) is the lower part of the petal, and inserted upon the receptacle; it is sometimes very short as in the Rose; in the Pink, as seen at Fig. 43, it is long and slender. The claw is analogous to the tube of monopetalous corollas.

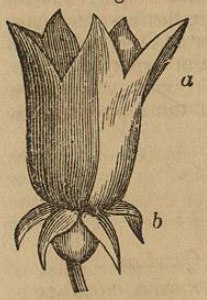
281. The corolla is *superior* when it is inserted above the germ; *inferior*, when below. It is *regular* when each division corresponds to the other. The Rose and Pink have regular corollas. When the parts do not correspond with each other, a corolla is *irregular*, as in the Pea and Violet.

Different forms of Monopetalous Corollas.

Monopetalous corollas may, according to their forms, be divided as follows;

277. What are the parts of a monopetalous corolla?
278. What are the parts of a polypetalous corolla?
279. What is the lamina?
280. What is the claw?
281. What is meant by the terms inferior and superior, regular and irregular, when applied to the corolla?

Fig. 44.



282. *Bell-form*, here the tube is not very distinct, as the corolla gradually spreads from the base; as in the blue-bell, hare-bell, &c. At Fig. 44, is the representation of a bell-form corolla; it is monopetalous; the limb (*a*) is five parted; calyx (*b*) five parted; corolla superior, or above the germ.

Fig. 45.

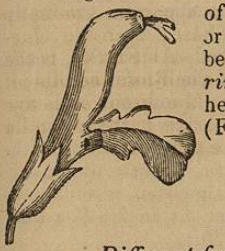
283. *Funnel-form* having a tubular base, and a border opening in the form of a funnel, as the morning-glory. (Fig. 45.)

Fig. 46.

284. *Wheel-form* having a short border without any tube, or with a very short one (Fig. 46.)

282. Describe the bell-form corolla.
283. Describe the funnel-form corolla.
284. What is meant by wheel-form?

Fig. 47.



285. *Labiate*, (from *labia*, lips,) consists of two parts, resembling the lips of a horse, or other animal. Labiate corollas are said to be *personate*,* having the throat closed, or *ringent*,† with the throat open. You have here a labiate corolla of the *ringent* kind. (Fig 47.)

Different forms of Polypetalous Corollas.

Fig. 48.

286. *Cruciform* (from *crux*, a cross) consisting of four petals of equal size, spread-out in the form of a cross as the Radish, Cabbage, &c. (Fig. 48.)

Fig. 49.

287. *Caryophyllous*, having five single petals, each terminating in a long claw, enclosed in a tubular calyx, as the Pink, (Fig. 49.)

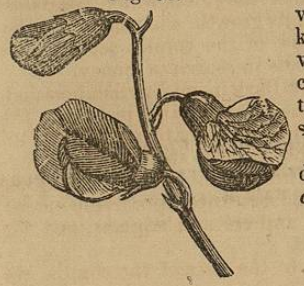
* From *personæ*, a mask.
† From *ringor*, to grin or gape.

285. What is a labiate corolla, and what is meant by the terms personate and ringent?
286. Describe the cruciform corolla.
287. Describe the caryophyllous corolla.

288. *Liliaceous*, a corolla with six petals, spreading gradually from the base, so as to exhibit a bell-form appearance, as in the Tulip and Lily.

289. *Rosaceous*, a corolla formed of roundish spreading petals, without claws, or with very short ones, as the Rose and Apple.

Fig. 50.



290. *Papilionaceous*, a flower with a banner, two wings, and a keel; the name is derived from the word *papilio*, a butterfly, on account of a supposed resemblance to this insect, as in the Pea blossom, (Fig. 50.)

291. When a corolla is of no determinate form, it is said to be *anomalous*.

Odour of Flowers.

292. The odour of flowers has its origin in the volatile oils, elaborated by the corolla.

293. Temperature renders the odours of flowers more or less sensible; if the heat is powerful, it dissipates the volatile oils more rapidly than they are renewed; if the heat is very feeble, the volatile oils remain concentrated in the little cells where they were elaborated; in both cases the flowers appear to have but little odour. But if the heat is neither too great nor too little the volatile oils exhale without being dissipated, forming a perfumed atmosphere around the flowers.

294. You see now the reason, that when you walk in a garden in the morning, or towards evening, the flowers seem more fragrant than in the middle of the day. The air being also more damp causes an increase of fragrance at those times, as the moisture, by penetrating the delicate tissue of the corollas, expels the volatile oils.

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288. What is a liliaceous corolla?
289. What is a rosaceous corolla?
290. What is a papilionaceous corolla?
291. When is a corolla said to be anomalous?
292. What causes the odour of flowers?
293. What effect has temperature upon the odour of flowers?
294. Why do flowers appear peculiarly fragrant in the morning and evening?

Uses of the Corolla.

295. One important office of the corolla is to secure the stamens and pistils from all external injury, and to favour their development. After the germ has become fertilized by the influence of the pollen, the corolla fades away, and either falls off, or remains withered upon the stalk; the juices which nourished it then go to the germ, to assist in its growth, and enable it to become a perfect fruit. Another use of the corolla seems to be to furnish a resting-place for insects in search of honey.

296. The corolla is supposed by Darwin, an English botanist, to answer the same purpose to the stamens and pistils, as the lungs in the animal system; each petal being furnished with an artery which conveys the vegetable blood to its extremities, exposing it to the light and air. This vegetable blood, according to this theory, is then collected and returned in correspondent veins, for the sustenance of the anthers and stigmas, and for the purpose of secreting honey.

297. After all our inquiries into the uses of the corolla, we are obliged to acknowledge that it appears not as important in the economy of vegetation, as many less showy organs. It seems chiefly designed to beautify and enliven creation by the variety and elegance of its forms, the brilliancy of its colouring, and the sweetness of its perfume.

Nectary.

298. In many flowers there is an organ called the *nectary*, which secretes a peculiar fluid, the honey of the plant; this fluid constitutes the principal food of bees, and various other species of insects.

299. The nectary seems not to be confined to any particular part of the flower. Sometimes it is a mere *cavity*, as in the lily

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295. What are some of the uses of the corolla?
296. What was Darwin's opinion of the use of the corolla?
297. For what does the corolla seem chiefly designed?
298. What is the use of the nectary?
299. Is the nectary confined to any particular part of the flower?

Fig. 51.

300. The Crown imperial, *Fritillaria Imperialis*, exhibits in the claw of each of its petals, a cavity called a nectary, each one is always filled with a sweet liquid. If these drops are removed, others immediately take their place. You have here a representation (Fig. 51,) of this flower; its petals appear as if cut off, in order to show the six nectariferous glands at the base of each.

201. In the Ranunculus, the nectary is a production of the corolla, in the form of a *scale;* in the violet a process of the same, in the form of a *horn* or *spur*. In the Columbine, the nectary is a separate organ from the petals in the form of a *horn*. In the Monks-hood, one of the petals, being concave, conceals the nectaries; they are therefore said to be *hooded*.

CHAPTER XIII.

Stamens and Pistils.

302. The stamens and pistils in most plants are enclosed by the same envelope, or stand upon the same receptacle; in the class Monœcia they are on different flowers which spring from one common root; and in Diœcia, they are on different flowers springing from different roots. Yet, however distant the stamens and pistils may be, nature has provided ways by which the pollen from the staminate flowers is conveyed to the pistillate, to assist in perfecting the seed. That you may be better understand this curious process, and the organs by means of which it is carried on, we will examine each one separately.

Stamens.

303. Stamens are thread-like parts, exterior as to the pistil, and interior as to the corolla. They exhibit a variety of positions, some being inserted *upon* the pistil, some *below* it, and others *around* it.

300. What is said of the nectaries of the Crown imperial?
301. What are some of the other forms in which nectaries appear?
302. Are the stamens and pistils always upon the same flowers?
303. How are stamens situated with respect to the pistil and corolla?

304. When a corolla is monopetalous, the number of stamens is usually either equal or double, or half that of the divisions of the corolla; the stamens in such flowers never exceed twenty.

305. In polypetalous corollas, the number of stamens may be much greater. When the number of stamens equals the divisions of the corolla, they usually alternate with these divisions of the corolla, half of the stamens are usually placed in the intervals of the divisions, and the remaining half before each lobe of the corolla, corresponding to the intervals in the divisions of the calyx. If any of the stamens are barren or without anthers, they are those which are placed before the lobes of the corolla.

306. In commencing the analysis of flowers according to the Linnæan system, you learned that the *number* of stamens, their *position*, *relative length*, and *connexion*, taken either singly or in combination, afford certain and distinctive marks for purposes of classification.

307. In the first place we find the stamens differing *in number*, in different plants; some plants have but one, some two, and so till we come to ten; when they have more than ten stamens, we find the number in the same plant varies, and therefore we cannot depend on the circumstance of number for further classification.

308. Secondly, we regard the *position*, and consider whether the stamens are inserted upon the calyx or the receptacle, thus furnishing an eleventh and a twelfth class.

309. Thirdly, *inequality in the length of stamens*, considered with respect to number, furnishes us with a thirteenth and fourteenth class.

310. Fourthly, the *connexion or union of stamens* gives us the fifteenth class, where the filaments of the stamens are united in one set; the sixteenth class where they are in two sets; the seventeeth where the anthers of the stamens are united.

311. Fifthly, the three remaining classes of phenogamous plants are distinguished by the *position of the stamens with respect to the pistils*. In the eighteenth class the stamens

304. What is said of the stamen of monopetalous corollas?
305. What is said of the stamens of polypetalous corollas?
306. What did you learn respecting stamens, in commencing the analysis of flowers?
307. What is the first thing in which we find stamens to differ?
308. What do we regard secondly with respect to the stamens?
309. What do we observe thirdly with respect to the stamens?
310. What do you observe fourthly as to the stamens?
311 What do we observe fifthly with respect to the stamens?

stand on the pistil; in the nineteenth, the stamens and pistils are on separate flowers on the same plant; in the twentieth they are on separate plants. Lastly, in Cryptogamous plants, they are invisible.

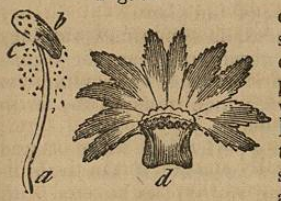
312. We will now proceed to the parts of the stamen; these are two. The *filament* and *anther*. The *filament*, is so called from *filum*, a thread. Filaments vary in their form; some are long and slender, as in the pink; others are short and thick, as in the tulip. They are usually smooth, but in the Mullein they are bearded, in the Spider-wort they are covered with down. In most cases a filament supports but one anther, but sometimes it is forked and bears two or more; in some instances, many filaments have but one anther. When the filaments are enclosed in the tube of the corolla, they are said to be *inserted*, when they extend out of it, *exserted*. In some cases the filament is wanting, and the anther is *sessile*, or immediately attached to the corolla.

313. In double flowers, the stamens, which seem to be intimately connected with the parts of the corolla, are changed to petals. This is the effect of cultivation, which by affording the stamens excess of nourishment, causes them to swell out, and thus assume the form of petals. In some double flowers almost every trace of the stamens disappears; in others, it is very easy to perceive the change which they have undergone, as they retain something of their original form. The anthers usually disappear, which shows that the filaments have absorbed all the nourishment. In many double flowers, roses especially, we can see the change as it takes place, some stamens being entirely changed, others retaining something of their form, and others still perfect. When all the stamens disappear, no perfect fruit is produced.

314. On account of this change in the stamens, cultivated flowers are not usually so good for botanical analysis, as wild ones. The single flower exhibits the number of parts which nature has given to it. The Rose in its native state has but five petals.

312. What is said of the filament?
313. What causes double flowers?
314. Are cultivated flowers usually the best for analysis?

Fig. 52



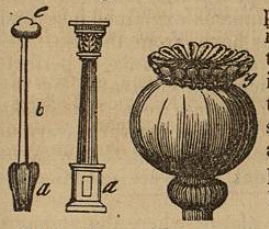
315. The *Anther*, is a little knob or box, usually situated on the summit of the filament; it has cells or cavities which contain a powder called the *pollen;* this is yellow, and very conspicuous in the Lily and Tulip. You have here the representation (Fig. 52) of a stamen with its filament (*a*,) its anther (*b*) and the discharging pollen (*c*.) In many flowers, you will perceive the filament to be wanting; the anthers are then said to be *sessile;* that is, placed immediately upon the corolla; as at *d*, which represents a flower cut open, and its five stamens growing sessile in the throat.

Pistils.

315. In the centre of the flower stands the Pistil, an organ essential to the plant. Like the stamens, pistils vary in number in different plants, some having but one, others hundreds Linnæus has founded the orders of his first twelve classes on the number of these organs.

317. The pistil consists of three parts, *germ*, *style*, and *stigma*. It may be compared to a pillar; the germ (Fig. 53, *a*) corresponding to the base; the style (*b*) to the shaft; and the stigma (*c*) to the capital.

Fig. 53.



The figure at (*g*) represents the pistil of the Poppy; the germ or base is very large; you will perceive that the style is wanting, and the stigma is *sessile*, or placed immediately on the germ. The style is not an essential part, but the stigma and germ are never wanting; so that these two parts, as in the Poppy, often constitute a pistil.

318. *Germ.* The germ contains the rudiments of the fruit yet in an embryo or unformed state. This germ is the future fruit, but in passing to its perfect state it undergoes a great

315 Describe the anther.
316. Describe the pistil.
317. What are the parts of the pistil?
318. Describe the germ.

change. You would scarcely believe that the Pumpkin is but the germ of the small yellow flower of the plant.

319. *Style.* This, like the filament, is sometimes wanting; when present, it proceeds from the germ, and bears the stigma on its summit. It is usually long and slender, of a cylindrical form, consisting of bundles of fibres, which transmit the fertilizing pollen from the stigma to the germ.

320. *Stigma.* This word signifies perfecting. The stigma is the top of the pistil, and always present; if the style be wanting, it is placed upon the germ, and said to be *sessile*, as in the Tulip and Poppy. The stigma is various in size and form; sometimes it is a round head; sometimes hollow and gaping, more especially when the flower is in its highest perfection; it is generally downy, and always more or less moist with a peculiar, glutinous fluid.

Use of the Stamens and Pistils.

321. We will now consider the use of the stamens and pistils, those organs so important, that without them no plant would produce fruit.

322. The pollen of the stamens, when the flower becomes mature, being thrown from the anther by the opening of its lids, falls upon the stigma, or top of the pistil, and passes through the style to the germ. In the germ are little seeds beginning to form, but which would never come to maturity without the agency of the pollen. You see now the wonderful contrivance by which the races of plants are preserved.

323. The real use of stamens and pistils was long a subject of dispute among philosophers, till Linnæus explained it beyond a possibility of doubt. These organs have, from the most remote antiquity, been considered of great importance in perfecting the fruit. The Date Palm, which was cultivated by the ancients, bears stamens and pistils on separate trees; the Greeks discovered that in order to have good fruit, it was necessary to plant the two kinds of trees near each other, and that without this assistance the dates had no kernel, and were not good for food.

324. Although the fertilization of plants, where the stamens

319. Describe the style.
320. What is the stigma?
321. What is said of the importance of the stamens and pistils?
322. Give an account of the manner in which the seeds in the germ are fertilized.
323. What did the Greeks discover with respect to the date-palm?
324. What are some of the various modes in which nature conveys pollen to the pistillate plants?

and pistils are on separate flowers, depends a little upon chance, the favourable chances are so numerous that it is hardly possible, in the order of nature, that a pistillate plant should remain unfertilized. The particles of the pollen are light and abundant, and butterflies, honey bees, and other insects, transport them from flower to flower. The winds also assist in executing the designs of nature.

325. The pollen of Pines and Firs, moved by winds, may be seen rising like a cloud above the forests; the particles being disseminated, fall upon the pistillate flowers, and rolling within their scaly envelopes, fertilize the germs.

326. A curious fact is stated by an Italian writer, viz., that at places about forty miles distant, grew two Palm trees, the one without stamens, the other without pistils; neither of them bore seeds for many years; but in process of time they grew so tall as to tower above all the objects near them. The wind thus meeting with no obstruction, wafted the pollen from the staminate to the pistillate flowers, which to the astonishment of all, began to produce fruit.

327. "Gardeners," says a botanical writer, "formerly attempted to assist nature, by stripping off the infertile flowers of melons and cucumbers, considering them as unnecessary incumbrances, since they would never become fruit. But finding that they then obtained no fruit at all, they soon learned the wiser practice of admitting the winds to blow, and the insects to transfer, the pollen of the infertile to the fruit-bearing flowers."

CHAPTER XIV.

Inflorescence—Receptacle—Fruit—Linnæus' classification of Pericarps.

328. We shall now proceed to consider the various ways in which flowers grow upon their stalks; this is called their *inflorescence*, or mode of flowering.

325. What is said of the pollen of pines and firs?
326. What fact is stated by an Italian writer?
327. What is the effect of stripping off the infertile or staminate flowers of plants?
328. What is meant by inflorescence?

Inflorescence.

329. The most common kinds of inflorescence are the *whorl*, *raceme*, *panicle*, *spike*, *umbel*, *cyme*, *corymb*, *fascicle*, *head*, *ament*, and *spadix*.

Fig. 54.

330. A *whorl* (Fig. 54,) is an assemblage of flowers surrounding the stem or its branches. This is seen in Mint, and many of the labiate plants. Flowers which grow in this manner are said to be *verticillate*, from the Latin word *verto*, to turn. Leaves surrounding the stem in a similar manner are said to be *stellate*, or like a star.

329. Which are the most common kinds of inflorescence?
330. Describe the whorl.

Fig. 55.

331. A raceme, (Fig. 55,) *a*, consists of numerous flowers on its own stalk or *pedicel*, and all arranged on one common *peduncle*, as a bunch of currants.

332. A panicle, (Fig. 55,) *b*, bears the flowers in a kind of loose subdivided bunch or cluster, without any regular order, as in the oat. A panicle contracted into a compact, somewhat ovate form, as in the Lilac, is called a *thyrse* or bunch. A bunch of grapes is a good example of a thyrse.

331. Describe the raceme.
332. What is a panicle, and how does a *thyrse* differ from it?

Fig. 56.

333. A spike, (Fig. 56, *a*) is an assemblage of flowers arising from the sides of a common stem; the flowers are sessile, or with very short peduncles, as the Grasses and the Mullein. A spike is generally erect. The lowest flowers usually blossom and fade before the upper ones expand. When the flowers in a spike are crowded very close, an *ear* is formed, as in *Indian corn*.

334. An umoel (Fig. 56, *b*) presents several flower-stalks of nearly equal length, spreading out from a common centre, like the rays of an umbrella, bearing flowers on their summits; as Fennel and Carrot.

335. A cyme (Fig. 56, *c*) resembles an umbel in having its common stalks al. spring from one centre, but differs in having those stalks irregularly sub-divided; as the Snow-ball and Elder.

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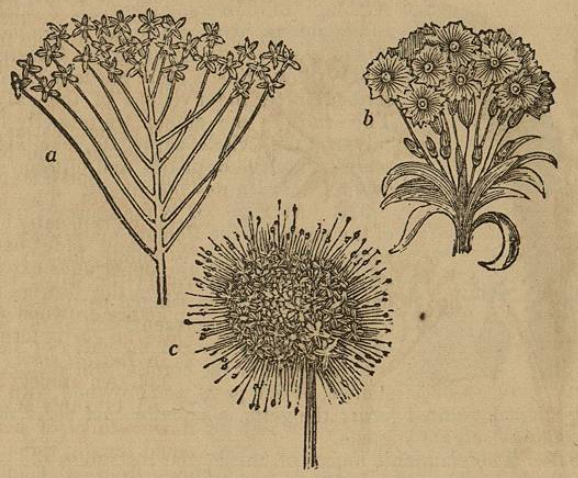
333. What is a spike?
334. What is an umbel?
335. What is a cyme?

Fig. 57.



336. 7th. *Corymb* (Fig. 57, *a*) or false umbel, when the peduncles rise from different heights above the main stem, but the lower ones being longer, they form nearly a level or a convex top; as the Yarrow.

8th. *Fascicle* (Fig. 57, *b*) flowers on little stalks variously inserted and subdivided, collected into a close bundle, level at the top; as the Sweet-William; it resembles a corymb, but the flowers are more densely clustered.

437. 9th. *Head* (Fig. 57, *c*) or tuft, has sessile flowers heaped together in a globular form; as in the Clover, and Button Bush.

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336. What is a corymb, and what is a fascicle?
337. What is a head?

Fig. 58.

338. 10th. *Ament*, or catkin, is an assemblage of flowers, composed of scales and stamens, arranged along a common, thread-like receptacle, as in the Chestnut and Willow; this is more particularly described under the divisions of the calyx. The scales of the ament are properly the calyxes; the whole aggregate, including scales, stamens or pistils, and filiform *receptacle*, constitutes the ament.

339. At Fig. 58, is the representation of the ament of the Poplar, containing pistillate flowers; this is oblong, loosely imbricated, and cylindrical; the calyx is a flat scale, with deep fringed partings. At *b*, is an enlarged representation of the fertile or pistillate flower: the calyx or bract is a little below the corolla, which is cup-shaped, of one petal, and crowned with an egg-shaped, pointed germ; the germ is superior, and bears four (sometimes eight) stigmas.

340. The staminate ament of the Poplar resembles the pistillate, except that its corolla encloses eight stamens but no pistil. The Poplar is in the class Diœcia, (or *two houses*,) because the pistillate and staminate flowers are on different trees, and of the order Octandria, because its barren flowers have eight stamens.

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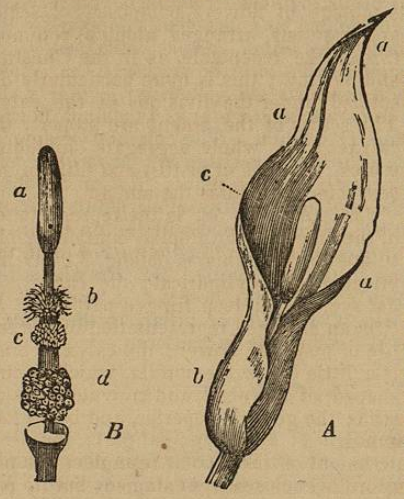
338. What is an ament?
339. What does Fig. 58 represent?
340. Why is the Poplar in the class Diœcia, order Octandria?

Fig. 59.



341. 11th. *Spadix*, is an assemblage of flowers growing upon a common receptacle, and surrounded by a spatha or sheath, as in the Egyptian lily.

342. At Fig. 59, *a*, is a representation of the blossom of the Wild turnip, (*arum*); *a*, represents the spatha, which is erect, sheathing, oblong, convolute at the base, *b*, this is compressed above and below the middle; *c* represents the spadix, which from its club-shaped appearance, is called *claviform* (from *clava*, a club).

343. At *B* (Fig. 59) is the spadix divested of the spatha, *a* is the claviform summit, *b* a ring of filaments without anthers, *c* a ring of sessile anthers, *d* a dense ring of pistillate flowers with sessile stigmas; each germ produces a one celled globular berry.

344. This is a plant of the class Monœcia, (*one house*,) because its staminate and pistillate flowers are separate, but yet grow on the same plant; it is in the order Polyandria, because its stamens are numerous.

Receptacle.

345. The receptacle is the extremity of the peduncle; at first it supports the flower, and afterwards the fruit. As this is its only use, it may properly be considered in connexion with

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341. Describe the spadix.
342. What does Fig. 59 represent?
343. What is represented at B. Fig. 59?
344. Why is the Wild Turnip in the class Monœcia, order Polyandria?
345. What is the receptacle?

he organs of fructification. In simple flowers, as the Tulip, the receptacle is scarcely to be distinguished from the peduncle, but in compound flowers it is expanded, and furnishes a support for the flowers and fruit. Receptacles are of various kinds; as,

346. 1st. *Proper*, supports but one flower, as in the Violet and Lily. 2d. *Common*, supports many flowers or florets, the assemblage of which forms an aggregate or compound flower, as in the Sunflower and Dandelion. The common receptacle presents a great variety of forms, it is either *dry* or *pulpy; concave* in the Artichoke; *convex* in other plants; *flat*, in the Sunflower; *conical* in some, and *spherical* in other plants. As to its surface, it is *punctuate*, or interspersed with hollow points or dots, as in the Daisy, *hairy* as in the Thistle, *naked* as in the Dandelion, or *chaffy* as in the Camomile. 3d. *Rachis*, is the filiform receptacle which connects the florets in a spike, as in the heads of wheat. 4th. *Columella*, or pillar, is the central column of the fruit, as the cob of the Indian corn.

The Fruit.

347. The fruit is composed of two principal parts, the *pericarp* and *seed*. The term pericarp is derived from *peri* around, and *karpos* seed or fruit; it signifies surrounding the seed. All that part in any fruit which is not the seed belongs to the pericarp.

Pericarp and Seed.

348. The germ being fetilized, the parts of the flower which are not necessary for the growth of the fruit, usually fade and either fall off, or wither away. The germ continues to enlarge until it arrives at perfection. Every kind of fruit,* you can see, has been once but the germ of a flower. The size of fruit is not usually proportioned to that of the vegetable which produced it. The Pumpkin and the Gourd grow upon slender herbaceous plants, while the large Oak produces but an acorn.

349. The pericarp consists of *valves*, *sutures*, *partitions*, *cells*, and a *receptacle*.

* The term fruit, in common language, is limited to pulpy fruits which are proper for food; but in a botanical sense, the fruit includes the seeds and pericarps of all vegetables.

346. Mention the different kinds of receptacle.
347. Of what is the fruit composed?
348. What takes place in the flower after the germ is fertilized?
349. Of what does the pericarp consist?

350. 1st. *Valves*, are the *pieces*, which form the sides of the seed vessels. If a pericarp is formed of one piece, it is *univalved;* the chestnut is of this kind. A pericarp with two valves is said to be *bivalved*, as a pea pod. The pericarp of the Violet is *trivalved*, that of the Stramonium *quadrivalved*. Most valves separate easily when the fruit is ripe; this separation is known by the term *dehiscence*.

2d. *Sutures* or *seams*, are lines which show the union of valves; at their seams the valves separate in the mature stage of the plant.

3d. *Partitions* or *dissepiments*, are internal membranes which divide the pericarp into different cells; these are *longitudinal* when they extend from the base to the summit of the pericarp; they are *transverse* when they extend from one side to the other.

351. *Column* or *columella*, the axis of the fruit; this is the central point of union of the partitions of the seed vessels; it may be seen distinctly in the core of an apple. This was noticed under the head of receptacles; it is the receptacle of the fruit.

352. 4th. *Cells*, are divisions made by the dissepiments and contain the seeds; their number is seldom variable in the same genus of plants, and therefore serves as an important generic distinction.

353. 5th. *Receptacle*, is that part of the pericarp to which the seed remains attached until its perfect maturity; this organ, by means of connecting fibres, conveys to the seed for its nourishment, juices elaborated by the pericarp.

354. Some plants are destitute of a pericarp, as in the labiate flowers, the compound flowers, and the grasses; in these cases the seeds lie in the bottom of the calyx, which performs the office of a pericarp.

Linnæus' Classification of Pericarps.

355. Linnæus divided pericarps into the nine following classes; *Capsule*, *Silique*, *Legume*, *Follicle*, *Drupe*, *Nut*, *Pome*, *Berry*, and *Strobilum*.

356. CAPSULE, signifies a little chest or casket; that is a

350. Describe each of these parts.
351. What is the column?
352. What are cells?
353. What is the receptacle?
354. Are any plants destitute of a pericarp?
355. What is Linnæus' division of pericarps?
356. What is a capsule?

hollow pericarp; which spontaneously opens by pores, as the poppy, or by valves, as in the Mullein.

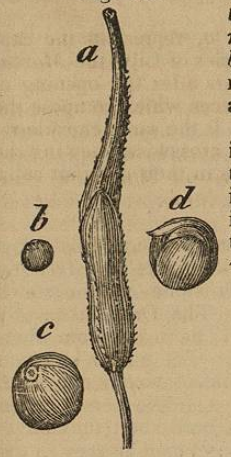
Fig. 60.

357. Fig. 60, *a*, represents the capsule of one species of Lily, the *Martagon*, as it appears after the opening of the valves or pieces which compose the pericarp. At *b* is the same capsule represented as cut crosswise, shewing the seeds as they lie in their different cells

358. 2d. Silique, or *Siliqua*, is a two-valved pericarp or pod, with the seeds attached alternately to its opposite edge, as Mustard and Radish. The proper silique is two-celled, being furnished with a membrane, which runs the whole length of this kind of pericarp, forming a partition; upon this the seeds are aranged. See Fig. 69 *D. b.*

357. What does Fig. 60 represent?
358. Describe the silique.

Fig. 61.



359. Fig. 61, *a*, represents a silique, the fruit of the white mustard; this is *rostrate*, terminating like a bird's beak; *b*, represents a globular seed: *c*. the same magnified; *d*, shews the seed dividing and the embryo making its appearance.

360. Silicle (*silicula*, a little pod,) is distinguished by being shorter than the proper silique; it is almost round, as in the Shepherd's purse. This difference, in the form of the Silique and Silicle, is the foundation of the distinction of the orders in the class Tetradynamia.

361. 3d. Legume, is a pericarp of two valves, with the seeds attached only to one *suture* or seam; as the pea.

362. In this circumstance it differs from the Silique, which has its seeds affixed to both Sutures. The word *pod* is used in common language for both these species of pericarp.

363. Plants which produce legumes, are called *leguminous* The greater number of these plants are in the 16th class, Diadelphia.

Fig. 62.

359. What does Fig. 61 represent?
360. What is a cilicle?
361. What is a legume?
362. How does it differ from the silique?
363. In what class are most leguminous plants?