

cavities are separated from each other it is very easy to follow their further development. In embryo II, Fig. 1459, the heart is still upright, and a transverse section of

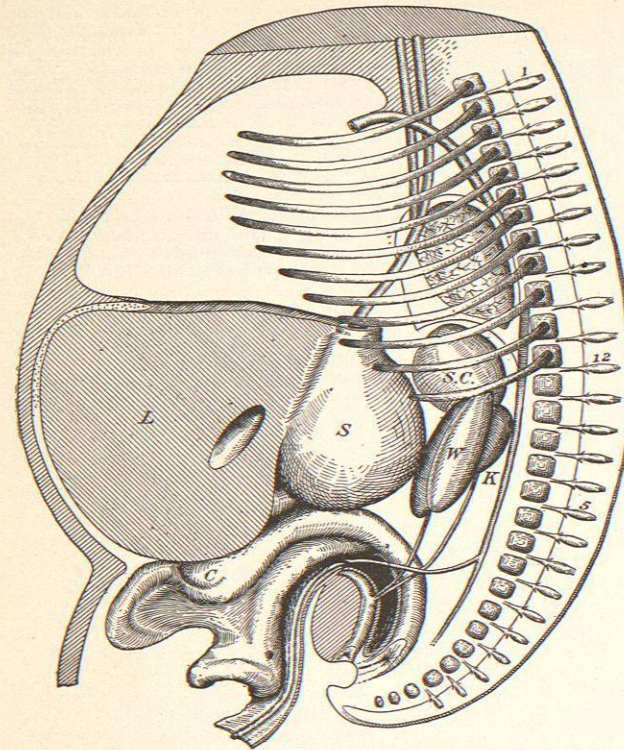


Fig. 1457.—Reconstruction of Embryo No. X. Enlarged 8 times. 1-12, Dorsal ganglia; S.C., suprarenal capsule; W., Wolffian body; K., kidney; L., liver; S., stomach; C., cæcum. The dotted area on the ventral side of the liver indicates the extent of the ventral mesentery of the liver.

it is also transverse to the lung. The pleural cavity lies wholly on the dorsal side of the pericardial (Fig. 1444). In the next stage, as the lungs descend more and more, the heart is tilted over so that its base is toward the lung and its apex away from it, as in embryo IX., shown in Figs. 1454 and 1460. The pericardial space has now become separated completely from the pleural, although both have grown at about the same pace. From now on the pleural space grows more rapidly than the pericardial, as shown in Fig. 1461. I have a number of embryos which represent intermediate stages between embryos IX. and XXII., and all of them confirm the idea that the pleural space develops first and then is followed by a growth of the lung. Fig. 1462, which is a section of embryo No. XLV., shows a marked increase in the size of the lung, but the heart and pericardial space are of about the same size as in embryo XXII. A much later stage is shown in Fig. 1463. The scale of enlargement is only half that of Fig. 1462, and when this is considered it is again seen that the heart has not grown very much, but the lung has developed enormously.

It is therefore seen that at first the pericardial cavity is on the oral side of the pleural, then on the ventral side, and is finally enclosed by the pleural cavity growing over it.

The growth of the pleural cavity over the peri-

cardial accounts for the location of the phrenic nerve in the adult. In Fig. 1459 the nerve passes to the septum transversum from the lateral body wall, and it is gradually separated from it by the descent of the septum and by the growth of the pleural cavity between the nerve and the body wall, thus locating the nerve in a membrane, as Figs. 1460 and 1461 will readily explain.

The expansion of the peritoneal cavity is by no means as simple. In it there are many bands and mesenteries as well as a marked shifting of the organs. With the descent of the testis a portion of it is cut off to form the tunica vaginalis.

In embryo II. the peritoneal cavity is extremely simple, as the figures show,—a simple cavity on each side communicating the one with the other by means of two openings, one above and one below the omphalomesenteric duct. Later, as the diaphragm descends more and more, the liver rotates, and its lobes soon fill the peritoneal cavity, while the intestine develops out into the core. The Wolffian body, sexual glands, and suprarenal capsule fill the dorsal side of the cavity and the rudimentary pelvis. The whole development of the intestine takes place within the cord, and finally it is drawn into the embryos when it is about 30 mm. in length. By what process this takes place I am unable to determine, but it must take place very rapidly, for I have never seen a human embryo in which it is only partly retracted. In the pig's embryo, however, I have found the stages in which the intestine is in process of retraction.

The liver now fills nearly the whole cavity, and extends down to the pelvis, and in embryo XXII. projects over the

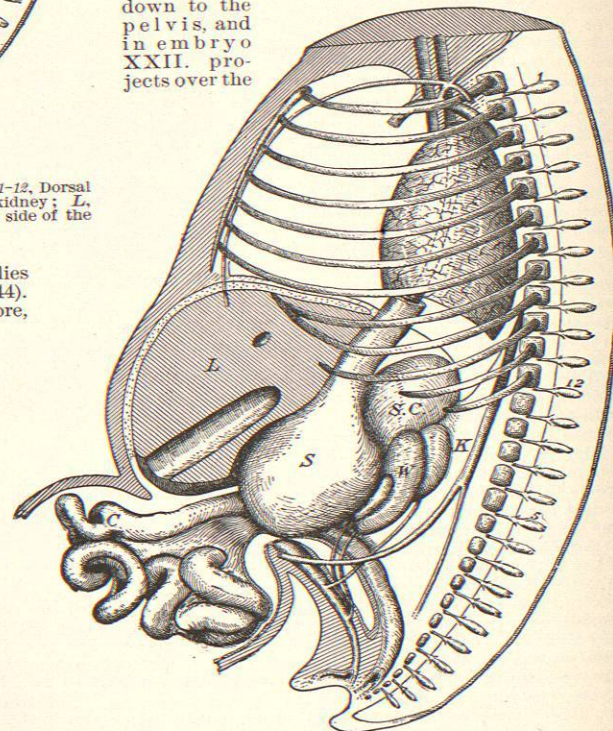
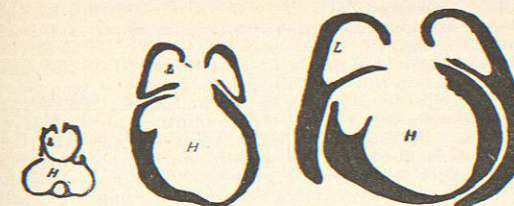


Fig. 1458.—Reconstruction of Embryo No. VI. Enlarged 8 times. 1-12, Dorsal ganglia; S.C., suprarenal capsule; K., kidney; W., Wolffian body; S., stomach; C., cæcum; L., liver. The dotted area on the ventral side of the liver indicates the extent of the ventral mesentery.

ovary and is in contact with the rectum. As the intestines are retracted from the cord the liver is relatively higher and higher, for the expansion of the abdominal walls is now greater below the umbilical cord than before, giving more space in this region for the intestine which displaces the liver. In embryos XXXIV. and XLVIII. the intestine has been studied, and it was found that it



Figs. 1459 to 1461.—Outlines of the Pleural and Pericardial Cavities to Show Their Relative Position and Size. Enlarged 7 times. Fig. 1459, Embryo No. II.; Fig. 1460, Embryo No. IX.; Fig. 1461, Embryo No. XXII. H, position of heart; L, position of lung.

is still located in the ventral portion of the peritoneal cavity, as there is no pelvic cavity large enough to hold any portion of it.

The extra-embryonic cœlom has only a short existence, as it is already completely obliterated in embryo No. XXII. This embryo came to me in an unopened ovum,

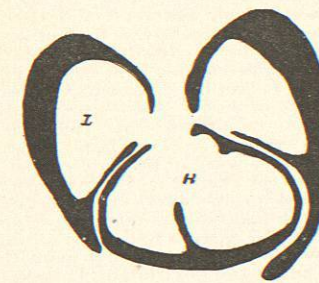


Fig. 1462.—Outline of Pleural and Pericardial Cavities in Embryo No. XLV. Enlarged 7 times.

and on this account is extremely valuable for this purpose. This embryo is about six weeks old, so, reasoning from it, the union of the amnion and chorion takes place earlier than is generally believed. In embryo No. XLIII., which is about five weeks old, the amnion has expanded over the whole embryo and has nearly reached the chorion



Fig. 1463.—Outline of Pleural and Pericardial Cavities in Embryo No. XXIV. Enlarged 3 1/4 times. H, Position of heart; L, position of lung.

The earlier stages are given in the sagittal sections. They show that the amnion is nearest the chorion at the caudal end of the embryo in the earliest stages, and soon the two unite at this point. As the embryo grows, the union of amnion and chorion extends. At the end of the fourth

week the extra-embryonic cœlom is still very large; at the end of the fifth week the space between the embryo and chorion is divided equally between the amnion cavity

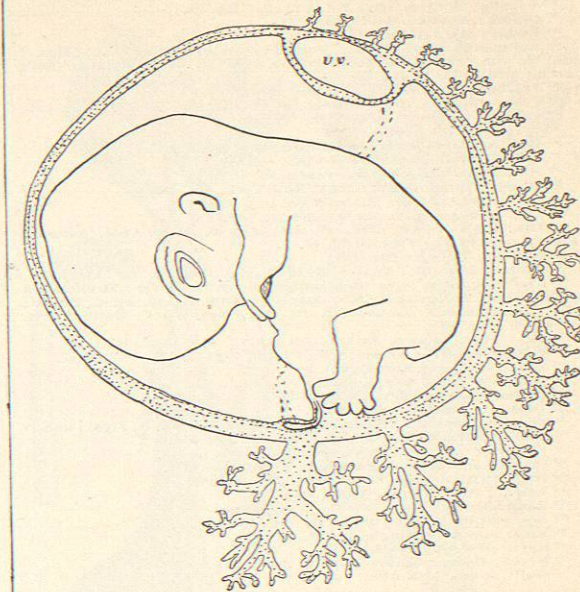


Fig. 1464.—Embryo No. XXII. Within the Ovum. Enlarged 3 diameters. The villi of chorion are outlined on one side of the ovum only. The umbilical vesicle, u. v., has become shifted around to the dorsal and right side of the embryo. The outline is made from a photograph, and is correct in detail with the exception of the attachment of the chord to the chorion. This in reality attaches itself to the chorion immediately to the right of the embryo.

and the cœlom; at the end of six weeks the extra-embryonic cœlom has disappeared. Franklin P. Mall.

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COFFEE.—The seeds of *Coffea arabica* L. (fam. *Rubiaceae*). Coffee itself is not official, having been replaced by its alkaloid (see *Caffeine*).

The coffee plant is a good-sized shrub or small tree, with opposite spreading or horizontal branches, and dark green, glabrous, nearly evergreen leaves. The white flowers grow in close clusters in the axils of the leaves. Farther down are the green and then the red fruits, the



FIG. 1465.—Branch of the Coffee Tree, *Coffea arabica*, with Fruit. (Baillon.)

whole being highly ornamental. The fruit is an oblong, rounded, scarlet or purplish, slightly juicy drupe, with a thin, fleshy mesocarp, and a papery endocarp, loosely

enclosing the two seeds. It is about 2 cm. long ($\frac{1}{4}$ to $\frac{1}{2}$ in.).

This shrub is a native of tropical Africa, where it grows very extensively upon both coasts, and far into the interior. It is also cultivated in most of the warm parts of the earth, especially in Java and Brazil.

Our earliest knowledge of coffee came from Arabia, where it was introduced from Abyssinia at least four hundred years ago. Its use was introduced into Europe by way of Constantinople, reaching London and Paris about the middle of the seventeenth century. Its cultivation was begun in Batavia at about the end of the same century, and in the beginning of the next it was being raised in India, Brazil, and the West Indies. The plants and the berries of these different countries present slight variations. Mocha coffee is small, plump, and dark yellow; Java larger and paler, and the Indian and American coffees larger and greenish gray or bluish gray. Mocha has the richest flavor, Java is one of the most delicate, and the West India and Brazilian kinds are coarser and less fragrant. Age, before they are roasted, improves them all.

Coffee is raised in orchards, where the trees are set in rows; trimmed and tended, they are long-lived and bear for many years. Two crops are usually produced each year. The pulp of the fruits is separated, usually by mechanical means, and the papery endocarp, when dry and brittle, broken and rubbed away. The testa of the seed is usually also absent in commercial coffee, excepting on the face, where it enters the ventral fissure.

COMPOSITION.—The most interesting ingredient, *Caffeine*, is described elsewhere. It occurs in coffee in combination with *caffeo-tannic acid*, in varying proportions between one-half of one per cent, and two and three-tenths per cent. The quality of the coffee, as usually estimated, depends only partially upon its amount of alkaloid. Of the *caffeo-tannic acid*, the yield is from four to five per cent. It is of the series which gives green salts with the persalts of iron. Besides these, are fixed oils, from fourteen to twenty-two per cent., *dextrin* from fourteen to sixteen per cent., a large amount of *albuminoid matter*, and a very minute amount of *volatile oil*. Roasting changes the character of coffee very materially, dissipating a little of its caffeine and most of its water, and forming some fragrant decomposition products not much understood. The seeds lose about fifteen or twenty per cent, in weight, and gain much more than that in volume. The sugar and dextrin are changed to caramel, and the soluble portions in general are diminished.

Unground coffee is seldom adulterated, but ground coffees are apt to be adulterated, the world over, by grains of various kinds. Of these admixtures, beans and chicory roots are the most important. It is better to purchase the whole seed than to puzzle over the mixtures. Pure ground and burnt coffee shaken in water does not immediately discolor it, as most of the imitations do. Recently, many brands of artificial "coffee," made wholly from grains and so advertised, have come into use as a warm and grateful drink, free from the nervous effects of caffeine. Many people become very fond of these products, which are used upon a vast scale.

ACTION AND USE.—The effect of coffee is in the main the same as that of caffeine, a nervous and cardiac stimulant; but it has in addition a pleasant, exhilarating effect upon the feelings, which is probably in part also due to aromatic ingredients contained in it, or developed by the roasting. It is occasionally given for sick and neuralgic headaches, and to counteract the disagreeable after-effects occasionally produced by opium; and in opium poisoning, which it mildly antagonizes by its stimulating effects upon the brain and circulation. The universal use of coffee, however, greatly restricts its usefulness as a medicine. Its excessive use, or its use by those unfortunately sensitive to it, produces wakefulness, "nervousness," confusion and incoherence of thought, palpitation, and irregular action of the heart and dyspeptic disorder. The excessive use of coffee is believed in Oriental countries to be responsible for many cases of blindness, and it

certainly causes disorders of vision when sufficiently abused to disturb the nervous equilibrium.

The dose of coffee for, say, headache, is from 15 to 20 gm. ($\frac{5}{8}$ ss.) in infusion, that is, a cupful made strong and "black." A fluid extract is to be had if desired.

There are twenty species of *Coffea*, natives of tropical Asia and Africa, several of which contribute a part to the total yield. One of these, *Coffea liberica*, of Western Africa, produces a larger seed, with a strong, full, but rather rank, flavor, known as Liberian coffee. Coffee leaves themselves contain caffeine, and are used as a beverage in the East. W. P. Bolles.

COHOSH, BLUE.—*CAULOPHYLLUM*. Pappoose Root, Squaw Root. The rhizome and roots of *Caulophyllum thalictroides* (L.) Michx. (fam. *Berberidaceae*). This is a perennial herb, with an erect, smooth stem, about 50 or 75 cm. (20 to 30 ins.) high, bearing a thrice-ternate leaf above the middle, and a raceme of greenish-yellow flowers at the top. The rhizome is horizontal, thick, crooked, scarred above, and covered below with numerous roots. It is a native of rich, damp woods, over most of the United States, and grows also in Japan and Manchuria. It was a favorite remedy in labor among some tribes of the North American Indians, as its vernacular names indicate.

The dried rhizome is thus described in the Pharmacopoeia: "About four inches (10 cm.) long, and about one-fourth to two-fifths of an inch (6 to 10 mm.) thick, bent; on the upper side with broad, concave stem scars, and short, knotty branches; externally, gray-brown; internally, whitish, tough, and woody. Roots numerous, matted, about four inches (10 cm.) long, and one-twentieth of an inch (1 mm.) thick, rather tough; nearly inodorous; taste sweetish, slightly bitter, and somewhat acrid."

It contains twelve per cent. of resin and some tannin, a glucoside much resembling saponin, and a small amount of the alkaloid caulophylline.

The drug is irritating to mucous membranes, the powder being highly sternutatory. It is much like saponin in its local effects. It is recommended as a uterine stimulant, of service in parturition, and also as a stimulating emmenagogue, but there is little reliable information in regard to its action. There is no official preparation, but the fluid extract is the best form of administration, in doses of gm. 0.3 to 2.0 (gr. v.-xxx.). Henry H. Rusby.

COLCHICUM.—*Meadow Saffron*. A genus of plants of the lily family (*Liliaceae*), comprising about thirty species, one of which, *C. autumnale* L., yields two official drugs, namely, the corm (*Colchici Radix*) and the seed (*Colchici Semen*). As these drugs are identical in properties and use, and practically so in composition, they are considered together. The plant is a perennial herb, with a very short subterranean upright stem, arising from the apex of a corm, and having at its side another corm, younger or older according to the season.

The corm of colchicum, in the latter part of the summer, when it is usually gathered, is principally composed of that portion which has just done service in ripening the fruit. It is about 5 cm. long by 4 in width ($2 \times 1\frac{1}{2}$ ins.), and enclosed in two brown papery coats. It is irregularly pear-shaped, rather pointed above, blunt and oblique at the base, and flattened and grooved on one side, where it clasps the new growth. At the apex is the scar or remains of the now decayed aerial vegetation. At the base, on the flattened side, is attached the new bud which is to produce the flower in the autumn, enclosed in the general coverings above mentioned. Later in the season the stem and flowers of the young bulbs form a column at the side of the old one, fitting into its flattened or grooved surface, and having the appearance of being simply a lateral bud of the older corm. During the following spring, however, the elder tuber shrivels away, and the new one, as its fruit ripens, becomes large and plump, and in its turn develops a junior for the succeeding fall.

Colchicum is a native of Middle, Southern, and Eastern Europe. It is frequent also in England, and is occasionally cultivated, for its pretty but sombre flowers, in this country. Our medical supply of the root comes principally from England and Germany. The corms are usually collected in midsummer, or shortly after, when they are the plumpest and finest looking. From this time until fall they do not change much, and if gathered when in flower would be probably equally good. They are sometimes used abroad in the fresh state; sometimes also dried whole. Usually, however, and always for this market, they are sliced and dried by the aid of gentle heat. Their quality is very sensitive to carelessness in drying. The seeds are simply collected and dried when ripe.

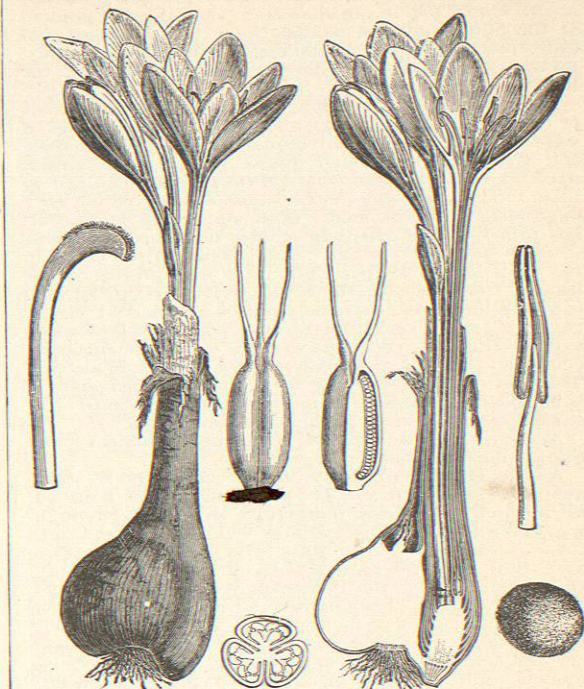


FIG. 1466.—Colchicum. Flowering plant, one-half natural size, and details of structure; also seed. (Baillon.)

Colchicum has been known as a poison since the time of Dioscorides, but as a medicine only for the last two or three hundred years. Its first admission to the London Pharmacopoeia was in 1618, and thirty-two years after it was dropped, and did not reappear in it until 1788, since which time it has been in regular employment (*Pharmacographia*).

DESCRIPTION.—*The Corm.*—The transverse slices into which the corm is cut are about 3 mm. ($\frac{1}{8}$ in.) thick, and from 1 to 3 cm. in diameter, according to their position. Their cut surfaces are white or grayish white, their edges (surface of the corm) brownish yellow. In shape they vary a little; those cut from the upper part may be simply round, but those of the middle and lower portions are flattened or indented at one side, where the flower buds lie, or they may even be typically kidney-shaped. The drug is occasionally sliced vertically, when the slices will be more or less ovate, and some of them longitudinally grooved. Even the whole corms are sometimes met with. They are hard, brittle, and loaded with starch. Taste very bitter and acrid, odor simply earthy.