A REFERENCE HANDBOOK
OF
THE MEDICAL SCIENCES.

UMBELLIFERÆ.—(*The Parsley Family.*) This large family, of nearly two hundred and fifty genera and at least fifteen hundred species, is distinguished for its aromatic properties. Elsewhere in this work we have discussed the drugs ammoniac, angelica, anise, asafœtida, caraway, carrot, conium, coriander, fennel, sumbul, etc., besides certain poisonous species in a separate article on poisonous plants. These drugs have been selected for individual treatment, not because they are more efficacious than many others in the family, but because custom has given them a more permanent position in medicine and commerce. What has been written of the constituents and properties of those drugs agrees, in general, with the facts regarding all others in the family. The so-called constituents are volatile oils, oleoresins, and gum-resins, but the active portions are in almost every case the volatile oils, the resins, in a few cases only, possessing activity. Their properties incline more toward antispasmodic and carminative than toward antiseptic or expectorant effects, and they are specially valued for their pleasant aromas and flavors.

Of *Parsley* (*Apium Petroselinum* L.) both the root and the fruit are quite largely employed. The former, as it occurs dried, in commerce, closely resembles a carrot in form and size, except that it is usually split longitudinally into quarters. It is of a light orange-yellow color and somewhat annulate externally, and pale-yellow internally, with a dark zone of resin tissue near the centre. It is usually rather tough and elastic, but becomes brittle when very dry. It is fragrant and of a pungent and sweetish taste. Besides the uses named above, it has considerable repute, mostly unprofessional, as a genito-urinary stimulant. The oil of this fruit contains *apiol* ($C_{12}H_{14}C_4$) in larger quantity than does that from other parts. Pure apiol is a white crystalline body, but that usually sold is in the form of a yellowish-green thick liquid. Its special use is as a stimulating emmenagogue, in doses of 0.2–0.5 gm. (gr. iij.–viij.). Parsley oil is given in doses about twice as large, and the root and fruit in doses of from 1 to 4 gm. (gr. xv.–lx.).

Celery fruit (*Apium graveolens* L.) is closely related to parsley, resembles the fruit of the latter, has similar properties, though less active, and is used in about the same doses. Probably its chief repute depends upon the very extensive advertising of proprietary preparations bearing its name, but not of its nature.

Thapsia, or *False Turpeth Root*, is the dried root of *Thapsia Garganica* L., a tall perennial of the Mediterranean region. Sometimes the entire root is used, sometimes only the very thick fleshy bark. It contains a highly irritant yellow oleoresin on which its properties depend. Its use has been revived from time to time for its counter-irritant effects, being either rubefacient or vesicant, according to the method of application. As an emetic poison it acts very much like mustard, though it is more active, and in large doses it is a violent irritant cathartic. As a rubefacient, a plaster is commonly employed containing five per cent. of its resin, combined with turpentine, Burgundy pitch, wax, etc.

We cannot do better than to conclude by reprinting the classification of the drugs of the family published in the preceding edition of this work.

First Group.—Yielding agreeable, or not offensive, oils from their fruits (which are mostly the parts used); stems and roots sometimes eaten, often fragrant and slightly resinous; generally, European species growing in open dry places, long cultivated, and not poisonous. The most typical examples are highest on the list.

Name.	*Constituents (oils and stearoptenes).*
Anise	Fluid and solid anethol.
Fennel	Hydrocarbon and anethol.
Caraway	Hydrocarbon (carvene) and carvol (liquid).
Ajowan	Hydrocarbon and thymol (cryst.).
Coriander	Two oils, probably hydrates of $C_{10}H_{16}$.
Cumin	Two oils, "cymol" and "cuminol."
Dill	Anethene and carvol.
Parsnip	Essential oil and miscellaneous substances.
Celery	Essential oil and apiin (an inert glucoside).
Parsley	Oil and cryst. stearoptene, apiin, and apiol.
Imperatoria	Oils—peucedanin.
Carrot	Oil, coloring matter (carotin).
Angelica	Oil, angelic acid, resin (has colored juice).
Lovage	Oil, resin (has colored juice).
	Etc., etc.

Various species of Eryngium and Sanicula have similar properties and uses.

Second Group.—Large Persian or African plants, with milky juice, yielding gum-resins from their stems and roots, usually offensive.

Name.	*Constituents.*
Asafœtida	Resin, gum, sulphureted oil.
Opoponax	Resin, gum, oil.
Sumbul	Resin, bluish oil.
Galbanum	Resin, gum, oil.
Ammoniac	Resin, gum, oil.
Thapsia (European)	Irritating resin and oil.
Etc. (See Asafœtida.)	

Third Group.—Plants containing poisonous, bitter, or nauseous principles, sometimes alkaloids of the coniine type, not usually very fragrant, sometimes without *vittæ*.

Conium (hemlock)	Alkaloids, coniine, conhydrine.
Cicuta	Cicutoxin, neutral (?) poisonous.
Hydrocotyle	"Vellarin," qualities indefinite.

Besides these, various species of *Œnanthe*, *Phellandrium*, *Sium*, and others have more or less deleterious qualities. *Henry H. Rusby.*

UMBILICAL CORD.—A knowledge of the development of the cord is prerequisite for understanding its structure at birth. Consequently its embryology will be described first, then its general condition at term, and finally the finer structure of its component parts.

Embryology.—In young human embryos the layer of cells which later forms the skin does not encircle the body. After covering the dorsal and lateral body walls this layer turns upon itself, and over the back of the embryo it meets and joins the corresponding layer from the opposite side, thus forming a closed transparent sac, the

amnion (Fig. 4827, *Am.*). Since the body wall is thus lacking on the ventral side, the intestinal tract is allowed to protrude. A great dilatation of the primitive intestine, the yolk sac, projects through this ventral opening

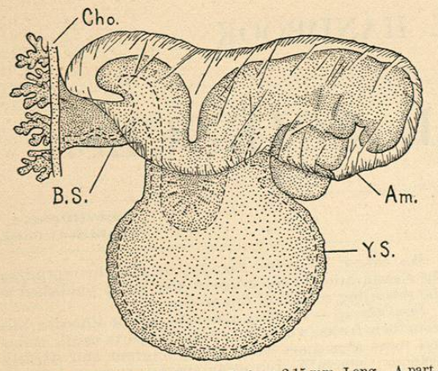

FIG. 4827.—Diagram of a Human Embryo 2.15 mm. Long. A part of the entodermal tract is shown by dotted lines. *Am.*, Amnion; *B.S.*, body stalk; *Cho.*, chorion; *Y.S.*, yolk sac. (After W. His.)

bounded by the line where the body wall is reflected to form the amnion. The yolk sac (Fig. 4827, *Y.S.*) is surrounded by an extension of the body cavity or cœlom. The entire embryo, including the amnion, lies within a hollow sphere of tissue lined with mesoderm and covered with villous ectoderm. This is the chorion, a small fragment of which is drawn in Fig. 4827 (*Cho.*). As made known by His, the human embryo is never free from the chorion, but is attached to it by a posterior continuation of the body, named the body stalk (Fig. 4827, *B.S.*). If a cross section of Fig. 4827 were made, passing between the letters *C* of *Cho* and *B* of *B.S.*, the body stalk would appear as in Fig. 4828. On its dorsal surface is the layer of ectoderm reflected to form the amnion. The ectoderm has a median depression considered by His to be a continuation of the medullary groove. The bulk of the body stalk is composed of mesoderm, in which runs a tubular extension of the intestinal tract, the allantois. This is shown in lengthwise view by dotted lines in Fig. 4827, and in cross section in Fig. 4828. The mesoderm of the stalk contains at this stage two arteries and two veins, known as the allantoic or umbilical vessels. They are constantly arranged as in Fig. 4829. The arteries pass from the iliac portion of the aorta along the body stalk to the chorion, into the villi of which they send branches. The veins convey the chorionic blood back to the embryo, passing through body stalk and body walls to the liver.

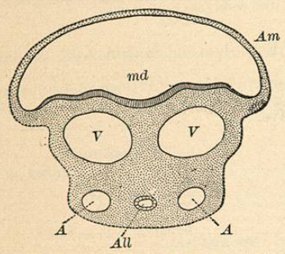

FIG. 4828.—Diagram of a Cross Section of the Body Stalk of a Human Embryo. *md*, Medullary groove; *Am*, amnion; *V*, umbilical vein; *A*, umbilical artery; *All*, allantois.

In mammals generally, the body stalk in earliest stages is a mass of mesoderm covered by ectoderm found at the posterior end of the embryo. The entodermal prolongation then extends into the mesodermal part, and the body stalk becomes split into two portions: one consisting of ectoderm and mesoderm, and extending between amnion and body wall; the other consisting of mesoderm and entoderm, and now lying free in the chorionic cavity. The latter is the allantois. It acquires, in most mammals, an expanded terminal portion, in pigs, for example, becoming a vesicle several inches long. The allantois may then become adherent to the chorion, so that the allantoic vessels pass over into the chorionic tissue. The primates and Tarsius differ from other mammals in that the allantois is never separated from the body stalk; its cavity remains a slender tube, called the *allantoic duct;* and its connection with the chorion is never severed.

The human placenta is therefore early and elaborately developed; the allantois may be considered rudimentary.

A later stage in the formation of the cord is shown in Fig. 4829. The body stalk, instead of extending backward, now runs almost vertically. The yolk sac has become relatively slender toward its intestinal attachment, the narrow portion forming the yolk stalk. The body walls have closed in around the yolk stalk, leaving a relatively smaller ventral opening. The ectoderm over the body stalk has swung forward on both sides, and anteriorly to the yolk stalk the folds have met and united. The resulting relations are seen in cross section in Fig. 4830, *A*, which would extend from × to × in Fig. 4829. The yolk stalk now lies in a part of the cœlom that is lined with mesoderm, and is covered with that ectoderm which passes around the body stalk. The single umbilical vein is due to the early fusion of the two vessels which occurs just outside of the body. It takes place in most mammals, but not in the horse (Bonnet). In man, rarely the two veins remain apart. The umbilical arteries sometimes fuse as reported by Hyrtl—a very uncommon occurrence.

The further development of the cord is chiefly a lengthening process, due to the drawing away of the embryo from the line of reflection of the body wall to form the amnion. The yolk stalk and allantois are stretched out into very slender tubes (Fig. 4831). The yolk sac remains between the amnion and the chorion. A cross section of a later stage is found in Fig. 4830, *B*. The cœlom has become quite small. It contains, at *Y*, a mass of mesoderm, from which the entodermal yolk stalk, and the blood-vessels which accompanied it, have entirely disappeared. Bridges of mesoderm form mesentery-like structures across the cœlom, and finally obliterate the cavity. The cord then shows no trace of the yolk stalk.

THE CORD AT BIRTH.—At birth the cord is a smooth, glistening, white or pearly, apparently twisted rope of

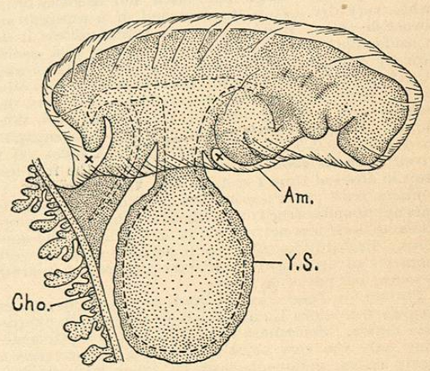

FIG. 4829.—Diagram of a Human Embryo, 2.6 mm. Long. Lettering as in Fig. 4827. (In part after W. His.)

tissue extending from fœtus to chorion. Its length is variable, but is usually about 55 cm.; the extremes are said to be 12 cm. and 167 cm., respectively. The human cord is relatively much longer than that of other

animals, a peculiarity correlated gratuitously with the great distention of the human amniotic cavity. Its diameter, also variable, averages 12 mm. The "twisting" of the cord, which begins in the second month, is gener-

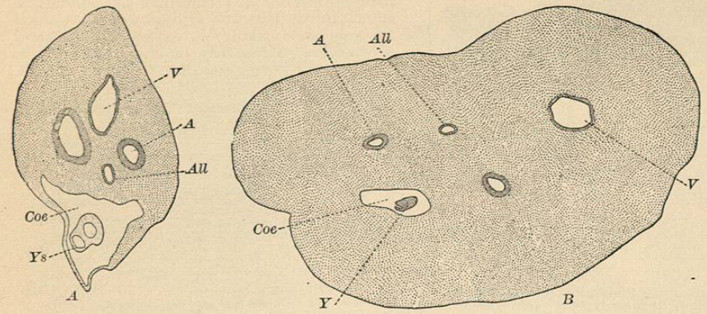

FIG. 4830.—Sections of Umbilical Cord. *A*, Embryo of 21 mm.; *B*, fœtus of sixty-four to sixty-nine days; *Y*, *Ys*, yolk stalk; *Coe*, cœlom. Otherwise the lettering is that of Fig. 4828. (Minot.)

ally due to the spirally arranged vessels within. They may be seen through the semitransparent substance which forms the bulk of the cord, and is called Wharton's jelly. Local thickenings in this tissue produce the so-called "false knots." Other irregularities, purplish in color, are due to intravascular blood clots. An actual twisting may occur, due to the activity of the fœtus. Thus the cord may be wound three times around the neck of the child with fatal results, or around the limbs resulting in intra-uterine amputations. Less serious entanglements are frequent. The cord may be tied in true knots, which rarely if ever interfere with circulation, since they are seldom drawn tight until birth.

Attachments of the Cord.—The navel, or umbilicus, is the scar which marks the place of separation between the persistent and caducous portions of the cord. The persistent part is lustreless and skin-covered, differing from the rest also in possessing capillaries. Its length in man is from 7 to 9 mm. (Kölliker). The shorter it is, the deeper will be the depression at the navel, which is produced by its contraction (Virchow). In cattle it measures 2 to 4 cm., and a protuberant navel persists for some time.

At the distal end of the cord the umbilical vessels branch and enter the chorionic mesoderm. The outer covering of the cord is continuous with the amnion, which spreads out over these vessels and is in contact with the chorion. Usually the cord meets the chorion at right angles, near the centre of its placental area. Sometimes it arrives by a more acute angle at the placental margin. Occasionally the vessels reach and branch in the non-placental chorion, through which they pass to the placenta. This is the velamentous insertion. Hyrtl found eleven velamentous, nineteen marginal, fifty-four excentric, and sixteen central insertions in one hundred placentas. The velamentous form is probably due to the ovum becoming implanted with its body-stalk turned away from the decidua serotina (Peters). A rare forking of the cord has been termed the insertio furcata. (For Schultze's fold, see *Yolk Sac*).

Covering of the Cord.—The epithelium of the cord has been best described by Minot and Bowen. At two months the ectoderm is a single layer of cells; at three months (Fig. 4832) it is two-layered, the outer being a continuation of the epitrichial layer of the skin; at five and six months the epitrichium is partly cast off, and the deeper layer has become several cells thick, with its outer part cornified. Thus it is intermediate between the many-layered skin and the single-layered amnion. There are, moreover, no lines of demarcation at either end of the cord. The similarity between amniotic and umbilical epithelia is shown by the "amniotic villi" which occur on both. The cord of the cow is beset with these elevations, which in flattened form are found on the amnion. They are merely epithelial proliferations (Fig. 4833) of unknown significance. The cords of domestic animals other than ruminants are smooth. Sometimes near the placental end of human cords, and especially on the adjacent amnion extending from Schultze's fold, pinhead elevations, or larger, flat, white areas may be found. Figs. 4834 and 4835, drawn from sections of the amnion from a normal afterbirth, indicate that these structures are quite like skin. They contain a dermis of dense connective tissue, and an epidermis of germinative, granular, cornified, and epitrichial layers. The covering of the cord, which is intermediate in its structure between skin and amnion, is called skin by Minot, Foulis, McMurrich, and others, and amnion by Kölliker, Hertwig, and Kollmann.

Wharton's Jelly.—The tissue of the cord, except near the blood-vessels, is of a unique sort, known as mucous connective tissue, or Wharton's jelly. Under the epithelium, with which it is inseparably connected, it may be slightly denser. Between the three blood-vessels (Fig. 4836), the tissue is loosest and forms three indistinct columns, the chordæ funiculi. Only in an injected alcoholic specimen have these structures, described more than one hundred and twenty years ago, appeared at all con-

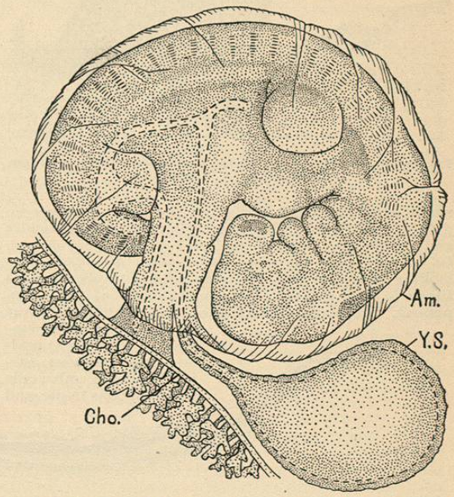

FIG. 4831.—Diagram of a Human Embryo, 7 mm. Long. Lettering as in Fig. 4829. (In part after W. His.)

spicuous. In the meshes of the tissue is a gelatinous substance containing mucin; the meshes themselves are of white fibrous elements, together with a small and

variable amount of elastic tissue. The latter appears only in late stages. In a young pig embryo of 6 mm., stained by Mallory's connective-tissue method, the cord consists of a loose network of anastomosing cells between

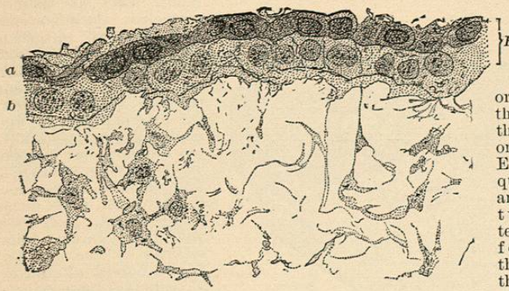

FIG. 4832.—Epithelial Covering (*Ep.*) of the Umbilical Cord of an Embryo of Three Months; *a*, its epitrichial, *b*, its inner layer. × 545 diameters. (Minot.)

which are numerous blue fibrils seeming to be quite independent of the cells (compare Fig. 4837). Kickhefel, from a study of mucous tissues, and others from general investigations, consider these fibres as transformations of cell protoplasm. Merkel and others believe them intercellular in origin. Be this as it may, the fibrils are abundant in the cord when the subcutaneous tissue shows scarcely a trace of them. In 18 mm. pigs the subcutaneous tissue has many fibrils, but the cells are closer together, and their protoplasmic processes more slender and shorter than those in the cord of the same embryo. In 40 mm. pigs the contrast between the œdematous-looking cord and the relatively compact subcutaneous tissue is even greater. Free anastomosis of the protoplasmic processes characterizes the umbilical tissue throughout its development. Virchow considered that mucous connective tissue, embryonic subcutaneous tissue, and

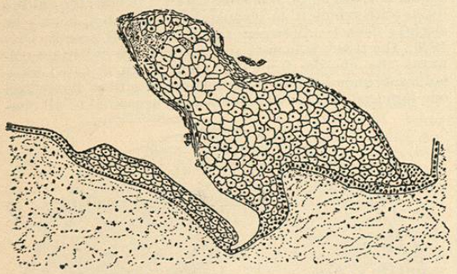

FIG. 4833.—Amniotic Villus, from the Umbilical Cord of a Fœtal Cow, 20 cm. Long. × 55 diameters.

considered as a "phase" in connective-tissue differentiation, an idea inconsistent with its distinct appearance in embryos of various ages, and with the fact that it alone develops without any capillary circulation.

Blood-Vessels.—The cord contains usually two parallel arteries and one vein, all pursuing a spiral course, with the arteries winding around the vein and making, in extreme cases, forty revolutions. These may be either from left to right or *vice versa*; sometimes they are absent, or the vein is on the outside, or the arteries cross one another. Except for a quite constant anastomosis between the arteries just before reaching the chorion, these vessels are without connections or branches.

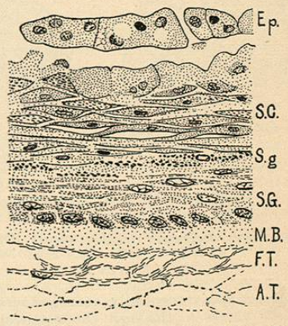

FIG. 4835.—Human Amniotic Villus. *Ep.* epitrichium; *S.C.*, stratum corneum; *S.g.* stratum granulosum; *S.G.*, stratum germinativum; *M.B.*, basement membrane of very dense fibrous tissue; *F.T.*, fibrous tissue; *A.T.*, areolar tissue. × 380 diameters.

Henneberg describes the histology of the arteries as follows: Each artery possesses an endothelium, an inner longitudinal muscle layer in which elastic tissue is abundant, but does not form a single internal elastic membrane, and an outer circular layer containing some longitudinal fibres and delicate elastic elements. The muscle cells are separated by an unusual amount of connective tissue, simulating protoplasmic bridges. There is no adventitia. The vein has an endothelium and a muscle layer, chiefly of circular fibres, but longitudinal bundles appear irregularly in this layer or on either side of it. Elastic plates are more highly developed than in the arteries. No vasa vasorum or valves exist in the umbilical vessels. Hemorrhage when the cord is severed is prevented by the contraction of the arteries, rendered possible by their lack of elastic tissue and abundance of muscle. The vein remains open, but the lumen of the artery is nearly or quite oblit-

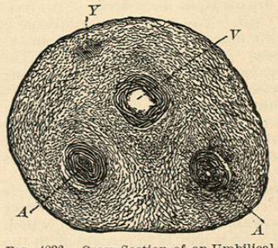

FIG. 4836.—Cross Section of an Umbilical Cord at Term. *V*, Remnant of the allantois; *V*, umbilical vein; *A*, *A*, umbilical arteries. × about 12 diameters.

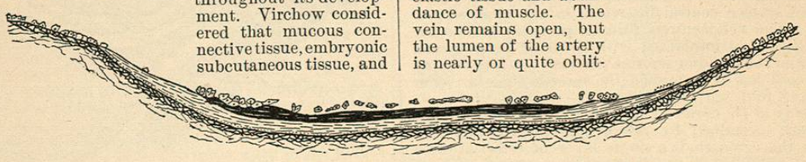

FIG. 4834.—"Amniotic Villus," from a Normal Human Amnion at Term. × 55 diameters.

the vitreous humor were quite similar, and the statement has been repeatedly copied. Since the vitreous humor has been found to be of ectodermal origin, it has recently been removed from this group. Wharton's jelly is still

erated (Fig. 4836). The stimulus causing the contraction is the tearing of the cord, which in cows accompanies the expulsion of the fœtus, in carnivora is accomplished by biting and in swine partly by trampling.

Henneberg's experiments eliminated other hypothetical factors, such as the clotting of the blood and the effect of the increased pulmonary circulation. Lochmann has recently produced general contraction of the vessels, especially of the arteries, by electric stimulation of the living cord. This is of special interest since the many attempts to demonstrate nerves in the cord have failed. Valentin is said to have traced nerve fibres from 8 to 11 cm. from the navel; other investigators have been less successful.

Lymphatics.—Various lymphatic canals, with stomata, have been reported (Tait), but these probably are merely intercellular spaces. Wandering cells are usually scattered about in Wharton's jelly. In a rare pathological specimen of the human cord, which is dotted with small white lesions resembling amniotic villi, polymorphonuclear leucocytes are abundant. The acute inflammatory process has not made evident any lymphatic vessels.

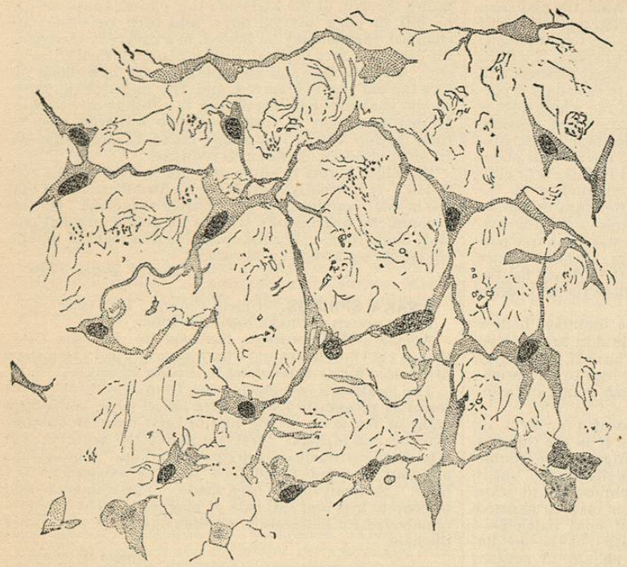

FIG. 4837.—Connective Tissue of the Umbilical Cord of a Human Embryo of about Three Months. × 511 diameters. Stained with alum cochineal and eosin. (Minot.)

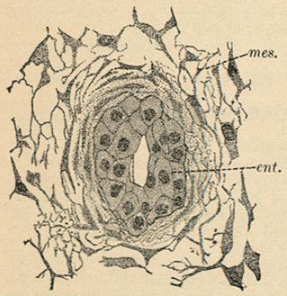

FIG. 4838.—Cross Section of the Allantoic Duct. × 340 diameters. (Minot.)

Allantois.—The allantois, as discovered by Sabine and confirmed by Ahlfeld, is generally to be found as an obliterated canal extending throughout the entire cord at birth. In earlier stages it has a lumen bounded by cuboidal cells (Fig. 4838, *ent.*). Later it is merely a strand of such cells, sometimes interrupted, but generally to be found between or equidistant from the two arteries. In the distal part of the cord its position is more variable (see Fig. 4836, *V*). It may retain its lumen until birth, when if the intra-abdominal portion is also pervious, a urinary fistula at the umbilicus is produced. For intestinal umbilical fistula, see *Yolk Sac.* *Frederic T. Lewis.*

BIBLIOGRAPHY.

Ahlfeld, F.: Die Allantois des Menschen und ihr Verhältniss zur Nabelschnur. Arch. f. Gynäk., 1876, vol. x., p. 81.

Bowen, J. T.: The Epitrichial Layer of the Human Epidermis. Anat. Anz., 1889, vol. iv., p. 412.

Foulis, J.: The Origin and Development of the Umbilical Cord and its Relation to the Amnion. Trans. Med. Chir. Soc., Edinburgh, 1900, vol. xix., p. 164.

Henneberg, B.: Beiträge zur feineren Struktur, Entwickelungsgeschichte und Physiologie der Umbilicalgefässe. Anat. Hefte, 1902, vol. xix., p. 523.

His, W.: Anatomie menschlicher Embryonen, iii., Leipzig, 1885.

Hörder, L.: Einige Fälle von Umschlingungen der Nabelschnur seltener Art. Arch. f. Gynäk., 1877, vol. xi., p. 364.

Hyrtl, J.: Die Blutgefässe der menschlichen Nachgeburt in normalen und abnormalen Verhältnissen, Wien, 1870.

Kickhefel, G.: Zur Histologie und zur systematischen Stellung der schleimigen oder gallertigen Gewebe des Menschen. Arch. f. path. Anat., 1892, vol. cxxix., p. 450.

Kölliker, A.: Entwickelungsgeschichte des Menschen und der höheren Thiere, Leipzig, 1879.

Lochmann, T.: Zur Anatomie und Physiologie der Umbilikalgefässe, Heidelberg, 1900.

Merkel, F.: Zur Histogenese des Bindsgewebes. Verh. d. Anat. Gesel., 1895, p. 41.

Minot, C. S.: Uterus and Embryo. Journ. of Morph., 1889, vol. ii., p. 341.

Peters, H.: Beiträge zur Kasuistik der vasa praevia und Gedankenzur Theorie der Insertio velamentosa. Monatssch. Geburtsh. u. Gynäk., 1901, vol. xiii., p. i.

Sabine, G. H.: Notiz über den Bau der menschlichen Nabelschnur. Arch. f. Gynäk., 1875, vol. ix., p. 311.

Tait, L.: Preliminary Note on the Anatomy of the Umbilical Cord. Proc. Roy. Soc. London, 1876, p. 417.

Virchow, R.: Die Cellularpathologie, fourth edition, Berlin, 1871.

UMBILICUS, SURGICAL AFFECTIONS OF THE.—

Malformations.—Surgical interest in the umbilicus begins at birth, since there may be important congenital malformations of this part of the body. In fœtal life the vitello-intestinal duct passes through the umbilicus and connects the yolk sac, which is outside the abdomen of the fœtus, with the intestine, which is within it. Normally this duct disappears with the yolk sac at about the eighth week of fœtal life, but it may persist and give rise to a cyst at the umbilicus or a fistula lined with mucous membrane; or, if the calibre of the duct is greater, the intestine itself may be prolapsed through it, and be injured when the umbilical cord is tied at birth. Such persistence of fœtal structures will be noticed as an umbilical hernia of the cord at birth; or, if the abnormal condition is less marked, a fistula will be seen when the cord drops off a few days later. Such a fistula may or may not communicate with the lumen of the intestine. If the discharge which comes from the fistula is purely mucous in character, attempts should be made to close the opening by caustics and strapping with adhesive plaster, in order to prevent further prolapse. This treatment may succeed in curing the patient even if the discharge contains a little fæcal matter. If the faulty closure at the umbilicus is more marked, an operation may be necessary to cure the patient, which operation in its essential details is the same as that performed for the purpose of closing an artificial anus—namely, opening of the peritoneal cavity, removal of the fistula, suture of the intestine, suture of the abdominal wall. This is, of course, a serious operation for a young infant.

The edges of the duct may be everted, in which case there will be presented a red, pedunculated tumor which tends to project more and more from the umbilicus. It is covered with mucous membrane which joins the sur-

rounding skin, there being no fistula. Such a condition is easily mistaken for a granuloma; but if it is excised the peritoneal cavity will probably be opened. The condition should be treated by removal of the mucous membrane from the mass and ligation of its pedicle.

In fœtal life the urinary bladder within the abdomen of the fœtus communicates with the allantois outside of the fœtus by a duct which passes through the umbilicus and is called the urachus. If this duct persists it will be opened by the falling away of the cord and a fistula will be exposed which discharges mucus, in case only a portion of the duct is patent, and urine if the whole duct is open as far as the bladder. Cauterization and pressure will almost invariably effect a cure in these cases, provided the urine flows freely through the natural channels. This condition may be acquired in infants or children through the existence of an obstruction in the urethra, complicated by cystitis, and afterward by the development of inflammation in the remains of the urachus. The treatment in such cases is first to establish a free passage for the urine through the urethra; second, to cure the cystitis; and, third, to dissect up the urinary fistula, suture the wound in the bladder, and close the abdominal wound.

Inflammation.—In stout people the umbilical hollow is deep. If dust and secretions of the skin are allowed to collect in it, a ball of material is formed which may chafe the skin and set up ulceration or lead to the formation of an abscess. Treatment for such conditions consists in incision and drainage.

The umbilicus may become the seat of a purulent, or biliary, or urinary, or fæcal fistula, as it is the thinnest portion of the abdominal wall. The origin of the trouble may be shown by the character of the discharge; but if this is simply mucous, it may be impossible to state from what organ it comes. Diagnosis may be assisted by ingestion of food containing small solid particles—for example, huckleberries,—by irrigation of the bladder with colored fluids, etc. Treatment should, of course, be directed to the seat of the trouble.

Tumors.—The tumors which are found at the umbilicus with sufficient frequency to give practical importance to their consideration are: granuloma or fibroma, sarcoma, sebaceous and dermoid cysts, and carcinoma.

A granuloma may develop in the wound caused by the dropping off of the umbilical cord. The treatment consists in keeping the parts clean, in applying to the pedunculated mass hydrogen peroxide, carbolic acid, or some other caustic, and in carefully adjusting a gauze pad which is to be held in position by adhesive plaster. The object of these last measures is to prevent the development of umbilical hernia. A similar tumor may form in later life as a result of long-standing ulceration due to uncleanliness. Such a fibroma should be removed and the wound treated as above.

Sarcoma or fibro-sarcoma of the umbilicus is a firm tumor covered with normal skin and possessing no pedicle. It should be radically excised, and, unless the tumor is very small, it is better to open the peritoneal cavity in so doing, since the surgeon can then be more sure of cutting away all the growth.

Sebaceous cysts and dermoid cysts of the umbilicus may reach a considerable size. The proper treatment is the removal, not only of the contents, but of the cyst wall. This operation may open the peritoneal cavity.

Carcinoma, usually of the type of epithelioma, forms a shallow ulcer, with a firm base and characteristic foul-smelling secretion; or it may grow upward in a cauliflower-like mass which does not ulcerate until a later stage. The prognosis depends upon the stage at which the tumor is removed. It is rather better in sarcoma than it is in carcinoma.

Secondary carcinoma of the umbilicus occurs in some cases of cancer of the alimentary tract and female genital organs. The disease extends to the umbilicus in most cases by direct continuity. No radical treatment is possible.

Hernia.—Umbilical hernia existing at birth or developing in infancy will rarely require operation. Such a hernia is usually small, perfectly reducible, and easily controlled by a small pad held in place by adhesive plaster. A curved wooden button mould covered with gauze makes an excellent pad for this purpose. To avoid irritating the skin of the abdomen the plaster straps should be left in place several days, and each time they are changed they should be placed in a different direction: for example, first vertical, then horizontal, then oblique, etc. The new pad and strapping should be at hand before the old one is removed, and the finger of the nurse should control the hernia during the change of dressing. If this treatment is conscientiously followed, most of these herniæ will be completely cured in a few months. In older children operation is required.

Umbilical hernia in adults is a much more serious condition. It is usually complicated with adhesions, so that the hernial contents are only partly reducible. On this account the wearing of a truss is unsatisfactory and possibly dangerous. (For the operative treatment of umbilical hernia see article on *Hernia.*)

Edward Milton Foote.

UNAKA SPRINGS.—Unicoi County, Tennessee.

Post-Office.—Unaka Springs Hotel.

Access.—Viâ Southern Railroad to Johnson City, thence viâ Ohio River and Charleston railroad (Tennessee division), twenty-three miles to Unaka Springs.

The location is seventeen miles from Jonesboro. This resort is pleasantly located in a small cove, containing eight or ten acres, at the foot of the Unaka Mountains. The location is about 2,000 feet above the sea level, and is entirely surrounded by higher elevations. The springs are four in number and flow about 9,000 gallons per hour. No analysis has been made. The waters are said to contain iron and sulphate of magnesia. They are recommended for indigestion, chronic dysentery, and other diseases.

James K. Crook.

UNDERWOOD SPRING.—Cumberland County, Maine.

Post-Office.—Falmouth Foreside.

This spring is located on the shores of Casco Bay. It yields about 200,000 gallons of water per day, and is said to have been used by white men since the days of Weymouth, the English explorer. The following recent analysis was made by a chemist whose name we have been unable to secure: One United States gallon contains (solids): Sodium chloride, gr. 0.86; silica, gr. 0.50; calcium carbonate, gr. 0.48; magnesium carbonate, gr. 0.14; potassium sulphate, gr. 0.12; organic matter, none. Total, 2.10 grains.

The water is used commercially. Being lightly mineralized and entirely free from organic matter, it is well adapted for table use. It is also said to be useful in conditions due to the uric-acid diathesis, gall-stones, urinary irritation, gout, rheumatism, and dyspepsia.

James K. Crook.

UNICORN ROOT. See *Aletris.*

UPPER RED BOILING SPRINGS.*—Macon County, Tennessee.

Post-Office.—Red Boiling Springs. Hotel.

Access.—Viâ Nashville and Chattanooga Railroad to Carthage; thence twenty-five miles by stage to springs. Or viâ Louisville and Nashville Railroad to Gallatin, thence forty-five miles by stage. Or viâ Middle and East Tennessee Central Railroad to Hartsville; thence twenty-eight miles by stage.

This resort was formerly known as Whitley Springs, and for many years its waters have had a wide reputation in this section. They are located on the highland rim in the eastern part of Macon County, a region well known for its fine climate and beautiful scenery. The Red Spring throws up a large amount of gas, which gives it

*No connection with Red Boiling Springs (Vol. VI., p. 862).

the appearance of boiling. It deposits a brilliant red sediment, which covers the sides and bottom of its basin and imparts a reddish tinge to the water. The Black Spring also possesses this peculiar boiling characteristic. The Red Spring was analyzed by Messrs. J. M. Safford and J. C. Wharton in 1893, with the following results: One United States gallon contains (solids): Calcium sulphate, gr. 31.16; calcium carbonate, gr. 7.03; magnesium carbonate, gr. 5.75; sodium chloride, gr. 43.87; potassium chloride, gr. 0.44; aluminum sulphate, gr. 0.15; iron carbonate, gr. 0.10; silica, gr. 0.47; organic matter and loss, gr. 2.42. Total, 91.39 grains. Gases: Sulphureted hydrogen and carbonic acid, 9.95 cubic inches. The waters of the Red Spring are highly recommended in renal and bladder affections, especially those arising from the uric acid or lithæmic tendency. They are believed to possess a powerful solvent action on renal calculi and gravel. These waters are also said to be of great value in cases of chronic uterine inflammations, leucorrhœa, etc. The Black Spring water has an excellent reputation in the treatment of rheumatism. The waters of both springs possess tonic and appetizing qualities. A comfortable hotel, with modern conveniences and abundant bathing facilities, was built in 1890. There are also a number of private boarding-houses in the vicinity.

James K. Crook.

UPPER SODA SPRINGS.—Liskyon County, California. Hotel.

These excellent springs are situated on the line of the Shasta scenic route of the Southern Pacific Railroad, at an elevation of 2,363 feet above the sea-level. The location is in Sacramento Canyon, and is picturesquely surrounded by immense forests of pine, fir, spruce, cedar, etc. At the springs is a quiet, spacious, old-fashioned hotel with wide verandas and an air of solid, homelike comfort. The waters are of the alkaline-carbonated class and are very palatable and wholesome. They contain chlorides of sodium and potassium, carbonates and bicarbonates of sodium, magnesium, potassium, iron, calcium, sulphates of sodium and magnesium, and a large quantity of free carbonic-acid gas. The water is aperient, diuretic, tonic, and antacid. It is highly recommended in the treatment of the uric-acid diathesis, gravel, and calculi, and irritative states of bladder and kidneys. The water is also of value in acid dyspepsia and flatulence.

James K. Crook.

URÆMIA. See *Auto-Intoxications,* and *Kidneys, Diseases of.*

URÆMIA, TREATMENT OF.—Regarded from the standpoint of treatment, the term "uræmia" should cover all derangements due primarily to blood poisoning on account of deficient elimination by the kidneys. The term then would include a number of functional disorders causing more or less prolonged invalidism, as well as the more serious conditions to which it is commonly applied. To limit the term to a more definite series of changes or symptoms is not practicable, because of the great variety and diverse nature of the poisons operative in different cases. How entirely dissimilar such poisons may be is illustrated by the fact that the symptoms which follow upon acute obstructive suppression of the urine are very different from those which occur in ordinary uræmia. Death follows in such patients with scarcely one of the clinical features of the latter state. In a case of the kind which I saw in consultation, the patient had his left kidney destroyed by a calculus becoming impacted in its ureter thirteen years before. At the time of my visit he had not passed any urine whatever for eight days; a condition of affairs which warranted the belief that a calculus had become similarly impacted in his right ureter. I stated that if not relieved by operation he would die, as similar cases do, without any symptoms of ordinary uræmia; and so he did, as the operation was refused. He retained his consciousness up to the end, and did not experience convulsions, coma, dyspnœa, vomiting, or intestinal symptoms, and there were no evidences of pulmonary congestion or of œdema in any part of the body. His death was apparently due to asthenia pure and simple.

A careful study of the great variety of symptoms of uræmia itself in different patients suggests the inference that there must be a corresponding variety of distinct poisons present in them, some of which it may be possible to recognize by their own special properties, in the same manner as we would recognize any of our drug poisons by their special properties. We might expect this to be so *a priori,* because modern chemistry has demonstrated that different poisons may arise in the decomposition of even the same tissues; and that the poisons of uræmia originate in the disintegration of the tissues of the body, scarcely admits of a doubt. Thus, two distinct poisons have been isolated from nervous tissue, viz., cholin and neurin, and their presence has been detected in the cerebro-spinal fluid drawn off during life in patients with some form of disease of the nervous system of a degenerative nature. Of these two poisons, neurin is much the more virulent, and it presents properties quite different from those of cholin.

So in uræmia I believe that we have among others one special poison—viz., urea—which is commonly present and which has an important bearing upon the course of renal diseases. The presence of this poison can be distinguished by its own specific effects, and, what is more for our present purpose, it can be combated by appropriate treatment.

In all cases of acute nephritis, from the onset of the first symptoms, a remarkable change occurs in all the arteries of the body, for they shrink in size, and the pulse accordingly rises in tension. The most striking fact about this change is its subsequent persistence, for it continues as long as the nephritis continues, and should that become chronic the high tension becomes likewise established for months or years. This has led many erroneously to attribute the high-tension pulse of chronic renal disease to endarteritis, supposedly caused by the poisoned blood circulating in the vessels. But while it is true that changes in the coats of the blood-vessels, especially when they proceed to the extent of obliterating the lumen of the arterioles, will mechanically cause high-tension pulse, yet this latter symptom appears long before such changes occur, and, as we will show, it is the strain of high tension, rather than the toxic condition of the blood, which causes the endarteritis.

That the high tension is due, not to kidney disease as such, but to the presence in the blood of some special poison, is rendered probable by the opposite condition of low-tension pulse in some patients with marked accompaniments of renal derangement, such as albuminuria and œdema. In these, however, cardio-vascular changes are significantly absent, the arteries being everywhere soft and permeable and the heart unaffected.

In the other class, on the contrary, the pulse is hard and wiry and the artery, though smaller than natural, is yet easily palpable to the touch from being overfull, while in the early stages, before changes have taken place in its coats, it may feel (or be) quite smooth. Ere long the heart gives signs of overwork, from the ischæmia caused by the universal contraction of the arteries, and it becomes hypertrophied. Acute dilatation of the heart, however, may occur at this stage and be associated with very serious symptoms, although not a sign of thickening or of atheromatous change can be detected yet in the arteries accessible to examination.

We have at our command, it so happens, an agent which, when it is experimentally injected into the circulation, produces in the arteries exactly the same condition as that which we have just described. Suprarenal extract, or its active principle, adrenalin, acts as a very powerful and universal vaso-constrictor, and thus greatly raises the general arterial pressure, so that its effects are indistinguishable from those of the supposed blood poison which we find operative in nephritis. If this be a fact it is not necessary to postulate that the daily amount of