In several instances, either the removal of the tumor itself by abdominal section (myomectomy), or the removal of the tumor and the gravid uterus (Porro's operation), has been resorted to on account of the grave concomitant symptoms, and with a fair measure of success. If the tumor is well out of the way, interference is not so urgently called for. The principal danger then is that the tumor will impede the postpartum contraction of the uterus, and favor hemorrhage. Even if this should happen, the flooding could be controlled by the usual means, especially by the injection of the perchloride of iron. I have seen several cases in which delivery has taken place under such circumstances without any untoward accident. The danger from inflammation and subsequent extrusion of the fibroid masses would probably be as great after abortion or premature labor as after delivery at term. It seems, therefore, to be the proper rule to interfere when the tumors are likely to impede delivery, and in other cases to allow the pregnancy to go on, and be prepared to cope with any complications as they arise. The risks of pregnancy should be avoided in every case in which uterine fibroids of any size exist, the patients being advised to lead a celibate life.

CHAPTER IX.

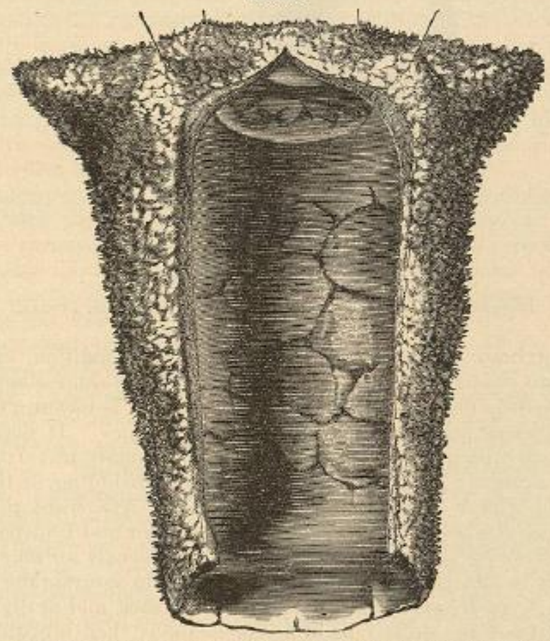
PATHOLOGY OF THE DECIDUA AND OVUM.

Pathology of the Decidua.—Comparatively little is, unfortunately, known of the pathological changes which occur in the mucous membrane of the uterus during pregnancy. It is probable that they are of much more consequence than is generally believed to be the case; and it is certain that they are a frequent cause of abortion.

One of the most generally observed probably depends on endometritis antecedent to conception. When the impregnated ovule reached the uterus, it engrafted itself on the inflamed mucous membrane, which was in an unfit condition for its reception and growth. A not uncommon result, under such circumstances, is the laceration of some of the decidual vessels, extravasation of the blood between the decidua and the uterine walls, and consequent abortion at an early stage of pregnancy. As this morbid state of the uterine mucous membrane is likely to continue after abortion is completed, the same history repeats itself on each impregnation, and thus we may have constant early miscarriages produced. It does not necessarily follow, however, that the pregnancy is immediately terminated when this state of things is present. Sometimes a condition of hyperplasia of the decidua is produced, the membrane becomes much thickened and hypertrophied in consequence of proliferation of its interstitial connective tissue, and

the decidual cells are greatly increased in size (Fig. 90). In other instances the internal surface of the decidua becomes studded with rough polypoid growths,[1] depending on proliferation of its interstitial tissue, a condition described as *endometritis decidualis polyposa*, or *tuberosa*. Duncan has found that the hypertrophied decidua is always in a state of fatty degeneration, more advanced in some places than in others.[2] The result of these alterations is frequently to produce dwindling or death of the ovum, which, however, retains its connection

Fig. 90.



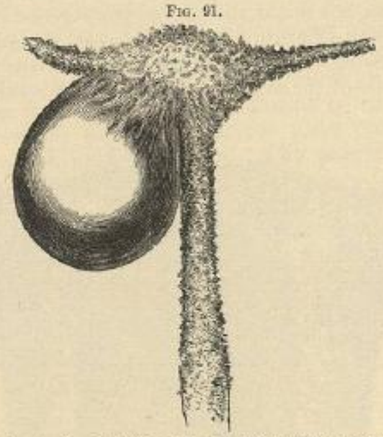
Hypertrophied decidua laid open, with the ovum attached to its fundal portion. (After DUNCAN.)

with the decidua, until, after a lapse of time, the decidua is expelled in the form of a thick triangular fleshy substance, with the atrophied ovum attached to some part of its inner surface. In other cases, in which the hyperplasia has advanced to a less extent, the nutrition of the fœtus is not interfered with, and pregnancy may continue to term, the changes in the decidua being recognizable after delivery. Other diseases besides endometritis may give rise to similar alterations in the decidua, one of these being, as Virchow maintains, syphilis. The converse condition, an imperfect development of the decidua, especially of the decidua reflexa, has also been noted as a cause of abortion. The

[1] Virchow's Archiv für Path., 1861, 1st edit.
[2] Researches in Obstetrics, p. 293.

ovum will then hang loosely in the uterine cavity without the support which the growth of the decidua reflexa around it ought to afford, and its premature expulsion readily follows (Fig. 91).

Fig. 91.



Imperfectly developed decidua vera, with the ovum. (After Duncan.)

Hydrorrhœa Gravidarum.—The peculiar condition known as *hydrorrhœa gravidarum* most probably depends on some obscure morbid state of the uterine mucous membrane. By it is meant a discharge of clear watery fluid at intervals during pregnancy. It may happen at any period of gestation, but it is most commonly met with in the latter months. It may commence with a mere dribbling, or there may be a sudden and copious discharge of fluid. Afterward the watery fluid, which is generally of a pale-yellowish color and transparent like the liquor amnii, may continue to escape at intervals for many weeks, and sometimes in very great abundance, so as to saturate the patient's clothes. Very frequently it is expelled in gushes, and at night, when the patient is lying quietly in bed; its escape is then probably due to uterine contraction.

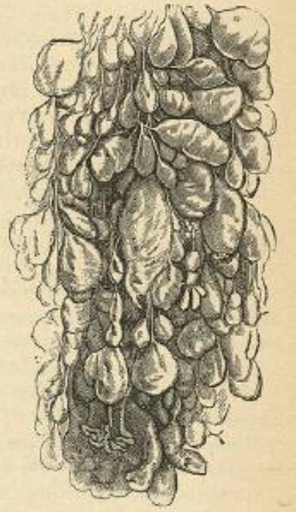
Many theories have been held as to its cause. By some it is attributed to the rupture of a cyst placed between the ovum and the uterine walls; Baudelocque referred it to a transudation of the liquor amnii through the membranes; while Burgess and Dubois believed it to depend on a laceration of the membranes at a distance from the os uteri. Mattei more recently has attributed it to the existence of a sac between the chorion and the amnion. It may be that in some instances a single discharge of fluid may come from one of the two last-mentioned causes. But if it be continuous, or repeated, another source must be sought for. Hegar[1] maintains that it is the result of abundant secretion from the glands of the mucous membrane, which are in a state of chronic inflammation, the fluid accumulating between the

[1] Monat. f. Geburt., 1863, Bd. xxii. S. 429.

decidua and chorion, and escaping through the os uteri. If this occur the decidua is probably in an hypertrophied and otherwise morbid state. Hydrorrhœa is chiefly of interest from the error of diagnosis to which it is likely to give rise; for, on being summoned to a case in which watery discharge has occurred for the first time, we are naturally apt to suppose that the membranes have ruptured, and that labor is imminent. Nor is there any very certain means of deciding if this be so. In hydrorrhœa, we find that pains are absent, the os uteri unopened, and ballottement may be made out. Even if the membranes be ruptured, there will be no indication for interference unless labor has actually commenced; and the repetition of the discharge and the continuance of the pregnancy will soon clear up the diagnosis. Hydrorrhœa, although apt to alarm the patient, need not give rise to any anxiety. The pregnancy generally progresses favorably to the full period, although in exceptional cases premature labor may supervene. No treatment is necessary, nor is there any that could have the least effect in controlling the discharge.

Pathology of the Chorion.—The only important disease of the chorion with which we are acquainted is the well-known condition which is variously described as *uterine hydatids, cystic disease of the ovum, hydatidiform degeneration of the chorion*, or *vesicular mole*. The name of uterine hydatids was long given to it on the supposition that the grape-like vesicles which characterize the disease were true hydatids, similar to those which develop in the liver and other structures. This idea has long been exploded, and it is now known as a certainty that the disease originates in the villi of the chorion. The precise mode and the causes of its production are, however, not yet satisfactorily settled. The disease is characterized by the existence in the cavity of the uterus of a large number of translucent vesicles, containing a clear limpid fluid which has been found on analysis to bear close resemblance to the liquor amnii. These small bladder-like bodies, which vary in size from that of a millet-seed to an acorn, are often described as resembling a bunch of grapes or currants. On more minute examination, they are found not to be each attached to independent pedicles, as is the case in a bunch of grapes, but some of them grow from other vesicles, while others have distinct pedicles attached to th chorion, the pedicles themselves sometimes being distended by fluid (Fig. 92). This peculiar arrangement of the vesicles is explained by their mode of growth.

Fig. 92.



Hydatidiform degeneration of the chorion.

Causes.—There has been considerable discussion as to the etiology

of this disease. By some it is supposed always to follow death of the fœtus; and the whole developmental energy being expended on the chorion, which retains its attachment to the decidua, the result is its abnormal growth and cystic degeneration. This is the view maintained by Gierse and Graily Hewitt, and it is favored by the undoubted fact that in almost all cases the fœtus has entirely disappeared, and by the occasional occurrence of cases of twin conceptions in which one chorion has degenerated, the other remaining healthy until term. On the other hand, it is maintained that the starting-point is connected with the maternal organism. Virchow thinks it originates in a morbid state of the decidua; while others have attributed it to some blood dyscrasia on the part of the mother, such as syphilis. There are many reasons for believing that causes of this nature may originate the affection. Thus it is often found to occur more than once in the same person; and alterations of a similar kind, although limited in extent, are not unfrequently found in connection with the placenta and membranes of living children. On this theory the death of the fœtus is secondary, the consequence of impaired nutrition from the morbid state of the chorion. The probability is that both views may be right, the disease sometimes following the death of the embryo, and at others being the result of obscure maternal causes.

Pathology.—The degeneration of the chorion villi generally commences at an early period of pregnancy, before the placenta has commenced to form. In that case, the entire superficies of the chorion becomes affected. The disease, however, may not begin until after the greater part of the chorion villi have atrophied, and then it is limited to the placenta. The epithelium of the villi appears to be the part first affected, and the whole interior of the diseased villus becomes filled with cells. The connective tissue of the villus undergoes a remarkable proliferation, and collects in masses in individual spots, the remainder of the villus being unaffected. By the growth of these elements the villus becomes distended, and many of the cells liquify, the intercellular fluid, thus produced, widely separating the connective tissue, so as to form a network in the interior of the villus.[1] Thus are formed the peculiar grape-like bodies which characterize the disease. When once the degeneration has commenced, the diseased tissue has a remarkable power of increase, so that it sometimes forms a mass as large as a child's head, and several pounds in weight.

The nutrition of the altered chorion is maintained by its connection with the decidua, which is also generally diseased and hypertrophied. Sometimes the adhesion of the mass to the uterine walls is very firm, and may interfere with its expulsion; while, in a few rare cases, it has been found that the villi have forced their way into the substance of the uterus, chiefly through the uterine sinuses, and thus caused atrophy and thinning of its muscular structure. Cases of this kind are related by Volkmann, Waldeyer,[2] and Barnes, and it is obvious that the intimate adhesion thus effected must seriously add to the gravity of the prognosis.

[1] Braxton Hicks: Guy's Hospital Reports, vol. ii., 3d series, p. 380.
[2] Virchow's Archiv, vol. xliv. p. 86.

Taking this view of the etiology of this disease, it is obvious that it is essentially connected with pregnancy, and that there would be no valid ground for maintaining, as has sometimes been done, that it may occur independently of conception. It is just possible, however, that true entozoa may form in the substance of the uterus, which, being expelled *per vaginam*, might be taken for the results of cystic disease, and thus give rise to groundless suspicions as to the patient's chastity. Hewitt has related one case in which true hydatids, originally formed in the liver, had extended to the peritoneum, and were about to burst through the vagina at the time of death. This occurred in an unmarried woman. One or two other examples of true hydatids forming in the substance of the uterus are also recorded. A very interesting case is also related by Hewitt,[1] in which undoubted acephalocysts were expelled from the uterus of a patient who ultimately recovered. A careful examination of the cyst and its contents would show their true nature, as the echinococci heads, with their characteristic hooklets, would be discoverable by the microscope.

It is also possible that unfounded suspicions might arise from the fact of a patient expelling a mass of hydatids long after impregnation. In the case of a widow, or woman living apart from her husband, serious mistakes might thus be made. This has been specially pointed out by McClintock,[2] who says: "Hydatids may be retained *in utero* for many months or years, or a portion only may be expelled, and the residue may throw out a fresh crop of vesicles, to be discharged on a future occasion."

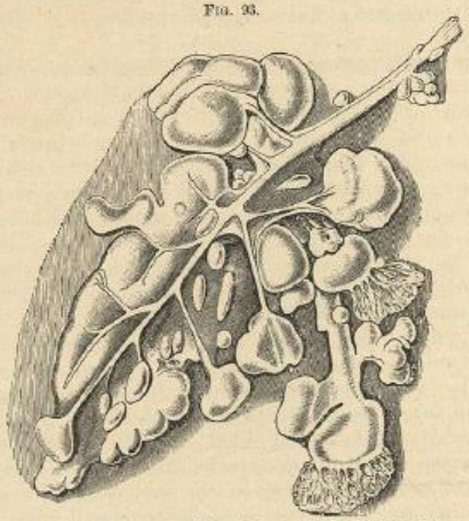
Symptoms and Progress.—The symptoms of cystic disease of the ovum are by no means well marked. At first there is nothing to point to the existence of any morbid condition, but as pregnancy advances its ordinary course is interfered with. There is more general disturbance of the health than there ought to be, and the reflex irritations, such as vomiting, may be unusually developed. The first physical sign remarked is rapid increase of the uterine tumor, which soon does not correspond in size to the supposed period of pregnancy. Thus, at the third month, the uterus may be found to reach up to, or beyond, the umbilicus. About this time there generally are more or less profuse watery and sanguineous discharges, which have been described as resembling currant juice. They no doubt depend on the breaking down and expulsion of the cysts caused by painless uterine contractions. They are sometimes excessive in amount, recur with great frequency, and often reduce the patient extremely. Portions of cysts may now generally be found mingled with the discharge, and sometimes large masses of them are expelled from time to time. Indeed, the discovery of portions of cysts is the only certain diagnostic sign. Vaginal examination, before the os has dilated, will give no information except the absence of ballottement. An unusual hardness or density of the uterus—described by Leishman, who attributes much importance to it, as "a peculiar doughy, boggy feeling"—has been pointed out by several writers. The contour of the uterine tumor,

[1] Obst. Trans., 1871, vol. xii. p. 237.
[2] McClintock's Diseases of Women, p. 398.

moreover, is often irregular. In addition, we, of course, fail to discover the usual auscultatory signs of pregnancy. All this may aid in diagnosis, but nothing, except the presence of cysts in the watery bloody discharge, will enable us to pronounce with certainty as to the nature of the disease.

Treatment.—As soon as the diagnosis is established, the indications for treatment are obvious. The sooner the uterus is cleared of its contents the better. Ergot may be given with advantage to favor uterine contraction, and the expulsion of the diseased ovum. Should this fail, more especially if the hemorrhage be great, the fingers, or the whole hand, must be introduced into the uterus, and as much as possible of the mass removed. The uterine cavity should then be well washed out with an antiseptic solution, such as creolin and water, or water with sufficient tincture of iodine dropped into it to give it a sherry color. As the os is likely to be closed, its preliminary dilatation by Hegar's dilators, or by a Barnes's bag, if it be already opened to some extent, will in most cases be required. If chloroform be then administered, the remaining steps of the operation will be easy. On account of the occasional firm adhesion of the cystic mass to the uterus, too energetic attempts at complete separation should be avoided. Any severe hemorrhage after the operation can be controlled by swabbing out the uterine cavity with the perchloride of iron solution.

FIG. 93.



Myxoma fibrosum of the placenta. (After STORCH.)

Myxoma Fibrosum.—Under the name of *Myxoma fibrosum* (Fig. 93) a more rare degeneration of the chorion has been described by Virchow and Hildebrandt,[1] characterized, not by vesicular, but fibroid

[1] Monat. f. Geburt., May, 1865.

degeneration of the connective tissue of the chorion. It results in the enlargement of the chorionic villi by fibrous hypertrophy, forming distinct tumors in the placental structure, and is more frequently met with in the later than the earlier periods of pregnancy. It does not, therefore, necessarily lead to the death of the child.[1]

Pathology of the Placenta.—The pathology of the placenta has of late years attracted much attention, and it has an important practical bearing, in consequence of its effect on the child.

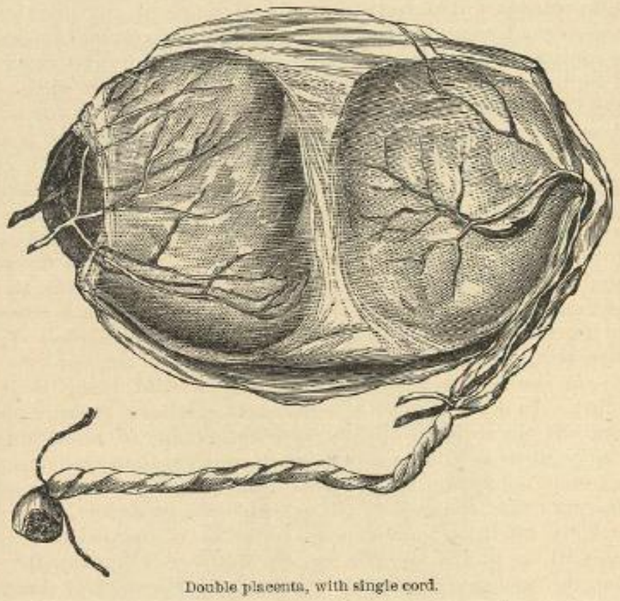
Placentæ vary considerably in shape. They may be crescentic, or spread over a considerable surface, in consequence of the chorion villi entering into communication with a larger portion of the decidua than usual (*Placenta membranacea*). Such forms, however, are merely of scientific interest. The only anomaly of shape of any practical importance is the formation of what have been called *placentæ succenturiæ*. These consist of one or more separate masses of placental tissue, produced by the development of isolated patches of chorion villi. Hohl believes that they always form exactly at the junction of the anterior and posterior walls of the uterus, which in early pregnancy is a mere line. As the uterus expands, the portions of placenta on each side of this become separated from each other. They are only of consequence from the possibility of their remaining unnoticed in the uterus after delivery, and giving rise to secondary post-partum hemorrhage. The rare form of double placenta with a single cord, figured in the accompanying woodcut (Fig. 94), was probably formed in this way, and the supplementary portion, in such a case, might readily escape notice.

The placenta may also vary in dimensions. Sometimes it is of excessive size, generally when the child is unusually big, but not unfrequently in connection with hydramnios, the child being dead and shrivelled. In other cases it is remarkably small, or at least appears to be so. If the child be healthy, this is probably of no pathological importance, as its smallness may be more apparent than real, depending on its vessels not being distended with blood. When true atrophy of the placenta exists, the vitality of the fœtus may be seriously interfered with. This condition may depend either on a diseased state of the chorion villi, or of the decidua in which they are implanted.[2] The latter is the more common of the two; and it generally consists in hyperplasia of the connective tissue of the decidua, which presses on the villi and vessels, and gives rise to general or local atrophy. The change is similar in its nature to that observed in cirrhosis of the liver, and certain forms of Bright's disease. It has been specially studied by Hegar and Mäier,[3] who describe it as beginning with a development of the elongated fusiform cells of the decidua, accompanied by an increase of the intercellular granular material. Eventually the cells undergo fatty degeneration, and the whole structure becomes fibroid. This has generally been ascribed to inflammatory changes, and, under the name of *placentitis*, has been described by many authors, and has been considered to be a common disease. To it are attributed many

[1] Priestley: The Pathology of Intra-uterine Death, p. 156.
[2] Whittaker: Amer. Journ. of Obstet., 1870–71, vol. iii. p. 229.
[3] Virchow's Archiv, 1871.

of the morbid alterations which are commonly observed in placentæ, such as hepatizations, circumscribed purulent deposits, and adhesions to the uterine walls. Many modern pathologists have doubted whether these changes are in any proper sense inflammatory. Whittaker observes on this point: "The disposition to reject placentitis altogether increases in modern times. Indeed, it is impossible to conceive of inflammation on the modern theory (Cohnheim) of that process, since there are no capillaries, in the maternal portion at least, through whose walls a 'migration' might occur, and there are no nerves to regulate the contractility of the vessel-walls in the entire structure." Robin

FIG. 94.



Double placenta, with single cord.

thus explains the various pathological changes above alluded to: "What has been taken for inflammation of the placenta is nothing else than a condition of transformation of blood-clots at various periods. What has been regarded as pus is only fibrin in the course of disorganization, and in those cases where true pus has been found the pus did not come from the placenta, but from an inflammation of the tissue of the uterine vessels and an accidental deposition in the tissue of the placenta." The extravasations of blood here alluded to are of very common occurrence, and they are found in all parts of the organ: in its substance, on its decidual surface, or immediately below the amnion, where they serve as points of origin for the cysts that are often there observed. The fibrin thus deposited undergoes retrograde metamorphosis as in other parts of the body: it becomes decolorized, it undergoes fatty degeneration, or becomes changed into calcareous masses; and in this way, it is supposed, may be explained the various pathological changes which are so commonly observed. The amount of retrograde metamorphosis, and the precise appearance presented, will, of course, depend on the time that has elapsed since the blood extravasations took place.

Fatty degeneration of the placenta, and its influence on the nutrition of the fœtus, have been specially studied in this country by Barnes and Druitt. Yellowish masses of varying sizes are very commonly met with in placentæ, and these are found to consist, in great part, of molecular fat, mixed with a fine network of fibrous tissue.

FIG. 95.

Fatty degeneration of the placenta.

The true fatty degeneration, however, specially affects the chorion villi (Fig. 95). On microscopic examination they are found to be altered and misshapen in their contour, and to be loaded with fine granular fat-globules. Similar changes are observed in the cells of the decidua. The influence on the fœtus will, of course, depend on the extent to which the functions of the villi are interfered with. The probable cause of this degeneration is, no doubt, some obscure alteration in the nutrition of the tissue, depending on the state of the mother's health. The probability is that generally the fatty degeneration is not a primitive change, but a stage of some other morbid condition which precedes or is associated with it. Barnes believes that syphilis has much influence in its production. Druitt has pointed out that some amount of fatty degeneration is always present in a mature

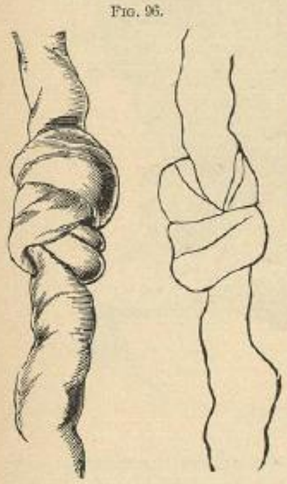
placenta, and is probably connected with the physiological separation of the organ; and Goodell has more recently suggested that an unusual amount of this change may be merely an anticipation of the natural termination of the life of the placenta.[1]

Other morbid states of the placenta, of greater rarity, are occasionally met with, as an œdematous infiltration of its tissue, always occurring, according to Lange, in cases of hydramnios, pigmentary and calcareous deposits, and tumors of various kinds; but these require only a passing mention.

Pathology of the Umbilical Cord.—The umbilical cord may be of excessive length, varying from eighteen to twenty inches, which is its average measurement, up to fifty or sixty inches, and a case is recorded in which it even reached the extraordinary length of nine feet. If unusually long it may be twisted round the limbs or neck of the child, and the latter position may, in exceptional instances, prove injurious during labor.

Some authors refer cases of spontaneous amputation of fœtal limbs *in utero* to constrictions by the umbilical cord, but this accident is more probably produced by filamentous adnexa of the amnion. Knots in the cord are not uncommon, and they result from the fœtus, in its movements, passing through a loop of the cord (Fig. 96). If there is an average amount of Wharton's jelly in the cord the vessels are protected from pressure, and no bad effects follow. Géry, in a recent paper on the subject,[2] attempts to show that such knots are more important than is generally believed, and relates two cases in which he believes them to have caused the death of the fœtus.

FIG. 96.



Knots of the umbilical cord.

Extreme torsion of the cord, an exaggeration of the spiral twists generally observed, may prove injurious, and even fatal to the child by obstructing the circulation in the vessels. Spaeth mentions three cases in which this caused the death of the fœtus, the cord being twisted until it was reduced to the thickness of a thread. Some recent writers,[3] however, believe that extreme twisting of the cord is a post-mortem phenomenon following rotation of the fœtus produced, after its death, by maternal movements.

Anomalies in the distribution of the vessels of the cord are of common occurrence. The cord may be attached to the edge, instead of to the centre, of the placenta (*battledore placenta*). It may break up into its component parts before reaching the placenta, the vessels running through the membranes; and if, in such a case, traction on the cord be made, the separate vessels may lacerate, and the cord become detached. There may be two veins and one artery, or only one vein and one artery, or there may be two separate cords to one placenta. These and other anomalies that might be mentioned are of little practical importance.

[1] Amer. Journ. of Obstet., 1869-70, vol. ii. p. 535.
[2] L'Union Médicale, October, 1876.
[3] Schauta: Arch. f. Gyn., 1881, Bd. xix. S. 96.

Pathology of the Amnion.—The principal pathological condition of the amnion with which we are acquainted is that which is associated with excessive secretion of liquor amnii, and is generally known under the name of *hydramnios*, which term Kidd[1] limits to cases in which more than two quarts of amniotic fluid exist. Its precise cause is still a matter of doubt. By some it is referred to inflammation of the amnion itself; at other times it is apparently connected with some morbid state of the decidua, which may be found diseased and hypertrophied. The fœtus is very often dead and shrivelled, and the placenta enlarged and œdematous. It does not necessarily follow, however, that hydramnios causes the death of the child. Out of thirty-three cases McClintock found that nine children were born dead;[2] and of the twenty-four born alive, ten died within a few hours, the remainder survived. There does not appear to be any marked relation between the state of the mother's health and the occurrence of this disease; and it is certainly not necessarily present when the mother is suffering from dropsical effusions in other parts of the body. The theory that the disease is of purely local origin is favored by the fact that when hydramnios occurs in twin pregnancy one ovum only is generally affected. The probability is that most cases of hydramnios are of fœtal origin, and are caused by some obstruction in the fœtal circulation, mainly in the heart and liver, the latter often syphilitic. If the maternal placental circulation is active, and the fœtal impeded, compensatory dropsical effusion into the sac of the amnion occurs as a consequence of the mechanical obstruction, and hydramnios results. Its effects, as regards the mother, are chiefly mechanical. It rarely begins to show itself before the fifth or sixth month of pregnancy, but when once it has commenced it rapidly produces a feeling of discomfort and enlargement, altogether beyond that which should exist at the period of pregnancy which has been reached. In advanced stages the distress produced is often very great, the enlarged uterus pressing upon the diaphragm, and producing much embarrassment of respiration. Premature expulsion of the fœtus very often supervenes. Four out of McClintock's patients died after labor, showing that the maternal mortality is high—a result which he refers to the debilitated state of the women who were the subjects of the disease.

[*Hydramnios* is a true cystic dropsy of the amniotic sac, and, although due to different causes, is in the worst cases the result of obstruction in the placento-fœtal circuit of bloodvessels, and mainly in the liver or heart of the fœtus. The amnion has the anatomical features of a secreting membrane, and is capable of endosmosis and exosmosis, the latter of which is notably exhibited in the removal of liquor amnii after fœtal death in an ectopic pregnancy. When from

[1] "On the Diagnosis of Dropsy of the Amnion." Proceedings of the Obstetrical Society of Dublin, May 11, 1878.
[2] Diseases of Women, p. 383.

any cause the circulation of blood is impeded in the fœtus, and the placenta still keeps up its functional activity, the disparity between placental supply and fœtal requirement will produce a dropsical effusion as the result of the mechanical obstruction; hence the large proportion of deaths in the fœtus in cases of hydramnios.—Ed.]

Diagnosis.—The diagnosis is not, as a rule, difficult. It has to be distinguished from ascitic distention of the abdomen, from enlargement of the uterus from twin pregnancy, and from ovarian tumor, or pregnancy complicated with ovarian tumor. The first will be recognized by the superficial position of the fluid; the difficulty of feeling the contour of the uterus, which is obscured by the surrounding fluid, and the results of percussion, which show that the fluid is free in the peritoneal cavity; and by the coexistence of dropsical effusions in other parts of the body. The second may be difficult, and even impossible, to diagnose from it: generally, however, in hydramnios the uterine tumor is more distinctly tense or fluctuating; the fœtal limbs cannot be felt on palpation; and the lower segment of the uterus, as felt *per vaginam*, is unusually distended, the presenting part not being appreciable. Ovarian tumors, alone or complicating pregnancy, may also be difficult to distinguish from dropsy of the amnion. The general history of the case, and the presence or absence of signs of pregnancy, may enable us to arrive at a diagnosis; and Kidd points out that the position of the uterus, whether gravid or not, is usually low down in the pelvis in ovarian dropsy, while in dropsy of the amnion it is drawn high up, and reached with difficulty on vaginal examination.

During labor an excessive amount of liquor amnii is often a cause of deficient uterine action and delay, the pains being feeble and ineffective. This, of course, tells chiefly in the first stage, which is often much prolonged, unless the membranes are punctured early, and the superabundant fluid is allowed to escape.

Treatment.—No treatment is known to have any effect on the disease. If the discomfort and distention are very great, it may be absolutely necessary to puncture the membranes, and allow the water to escape. This inevitably brings on labor. If the pregnancy be not sufficiently advanced to give hope for the birth of a living child, we would not, of course, resort to this expedient unless the mother's health was seriously imperilled. It is possible that in such cases the patient might be relieved by inserting a minute aspirating needle through the os, and removing a certain quantity of the liquor amnii by aspiration, without inducing the labor. I have never had an opportunity of trying this expedient, but it seems a possibility.

Deficiency of Liquor Amnii.—A defective amount of liquor amnii is said to favor certain malformations, by allowing the uterus to compress the fœtus unduly. It certainly occasionally gives rise to adhesion between the fœtus and the membranes, and to the formation of amniotic bands which are capable of producing certain fœtal deformities (pp. 245, 250).

The liquor amnii itself varies much in appearance. It is sometimes thick and treacly, instead of limpid, and it may be offensive in odor. The cause of these variations is not well understood.

Pathology of the Fœtus.—There is abundant evidence that the fœtus *in utero* is subject to many diseases, some of which cause its death, and others leave distinct traces of their existence, although not proving fatal. The subject is of great importance, and is well worthy of study. There is still much to be done in this direction, which may lead to important practical results. I can, however, do little more than enumerate some of the principal affections which have been observed.

Diseases Transmitted through the Mother.—It is a well-established fact that the various eruptive fevers from which the mother may suffer may be communicated to the fœtus *in utero*. When the mother is attacked with confluent smallpox she almost always aborts, but not necessarily so when it is discrete or modified. In such cases it has often happened that the fœtus has been born with evident marks of smallpox. Cases are on record which prove that the fœtus was attacked subsequently to the mother. Thus a mother attacked with smallpox has miscarried, and has given birth to a living child showing no trace of the disease, which, however, showed itself in two or three days; proving that it had been contracted, and had run through its usual period of incubation, when the fœtus was still *in utero*. It does not follow, however, that the fœtus is affected, as Serres has collected twenty-two cases in which women suffering from smallpox gave birth to children who had not contracted the disease. It has been supposed that in such cases the child is protected from smallpox, though it has shown no symptom of having had the disease. Tarnier, however, cites two instances in which such children had smallpox two years after birth. Madge and Simpson record cases in which vaccination performed on the mother during pregnancy protected the fœtus, on whom all subsequent attempts at vaccination failed. There is evidence also to prove that the disease may be transmitted to the fœtus through a mother who is herself unsusceptible of contagion; the child having been covered with smallpox eruption, the mother being quite free from it. It is probable that the same facts which have been observed with regard to smallpox hold true with reference to other zymotic diseases, such as scarlet fever and measles, although there is not sufficient evidence to justify a positive assertion to that effect.

Amongst other maternal diseases, malaria and lead-poisoning are known to affect the fœtus *in utero*. Dr. Stokes relates cases in which the mother suffered from tertian ague, the child having also attacks, as evidenced by its convulsive movements, appreciable by the mother, which took place at the regular intervals, but at a different time from the mother's paroxysms. In other cases the febrile paroxysm comes on at the same time in the fœtus as in the mother; and the fact has been verified by the observation that the paroxysms continued to recur simultaneously after delivery. The fœtus has also been born with distinct malarious enlargement of the spleen. From the frequency with which largely hypertrophied spleens are seen in mere infants in malarious districts, I imagine that the intra-uterine disease must be common. I have frequently observed this fact in India, although, of course, without any possibility of ascertaining if the mothers had

suffered from intermittent fever during pregnancy. Lead-poisoning is also known to have a most prejudicial effect on the fœtus, and frequently to lead to abortion. M. Paul has collected eighty-one cases[1] in which it caused the death of the fœtus, in some not until after birth; and occasionally it seems to have affected the fœtus even when the mother escaped.

Of all blood-dyscrasiæ transmitted to the fœtus, the most important is *syphilis*. Its influence in producing repeated abortion is elsewhere described (p. 257). It may unquestionably be transmitted to the fœtus without producing abortion, and at term the mother may be either delivered of a living child, bearing evident traces of the disease; of a dead child similarly affected; or of an apparently healthy child in whom the disease develops after a lapse of a month or two. These varying effects probably depend on the intensity of the poison; and the longer the time that has elapsed since the origin of the disease in the affected parent, the better will be the chance for the child. The disease is, no doubt, generally transmitted through the mother, and if she be affected at the time of conception, the infection of the fœtus seems certain. If, however, she contracts the disease at an advanced period of pregnancy, the child may entirely escape. Ricord even believes that syphilis contracted after the sixth month of pregnancy never affects the child. The father alone may transmit the disease to the ovum; and Hutchinson has recorded cases to show that the mother may become secondarily affected through the diseased fœtus. The evidences of syphilitic taint in a living or dead child are sufficiently characteristic. The child is generally puny and ill-developed. An eruption of pemphigus is common, either fully-developed bullæ, or their early stage, when they form circular copper-colored patches. This eruption is always most marked on the hands and feet, and a child born with such an eruption may be certainly considered syphilitic. On post-mortem examination the most usual signs are small patches of suppuration in the thymus, similar localized suppurations in the tissues of the lungs, indurated yellowish patches in the liver, and peritonitis, the importance of which in causing the death of syphilitic children has been specially dwelt on by Simpson.[2]

The most important of the inflammatory diseases affecting the fœtus is peritonitis. Simpson has shown that traces of it are very frequently met with, and that it is not always syphilitic. Sometimes it has been observed when the mother has been in bad health during pregnancy, and at others it seems to have resulted from some morbid condition of the fœtal viscera. Pleurisy with effusion is another inflammatory affection which has been noticed.

The dropsical affections most generally met with are ascites and hydrocephalus, which may both have the effect of impeding delivery. Of these, hydrocephalus is the more common, and may give rise to much difficulty in labor. Its causes are uncertain, but it probably depends on some altered state of the mother's health, as it is apt to recur in several successive pregnancies, and is not infrequently associated with an imperfectly developed vertebral column and spina bifida. The fluid collects in the ventricles, which it greatly distends, and these then produce expansion and thinning of the cranium, the bones of which are widely separated from each other at the sutures, which are prominent and fluctuating. In a few cases internal hydrocephalus may be complicated, and the diagnosis in labor consequently obscured by the coexistence of what has been called "external hydrocephalus." This consists of a collection of fluid between the skull and the scalp, which may be either formed there originally or may collect from a rupture of one of the sutures or fontanelles during labor, through which the intra-cranial fluid escapes.

[1] Arch. gén. de Méd., 1860.

[2] Obst. Works, vol. i. p. 117.

Ascites is generally associated with hydramnios, and sometimes with hydrothorax, or other dropsical effusions. It is a rare affection, and according to Depaul[1] extreme distention of the bladder is not unfrequently mistaken for it.

Tumors of different kinds may be met with in various parts of the child's body, which sometimes grow to a great size and impede delivery. Tarnier records cases of meningocele larger than a child's head, and large cystic growths have been observed attached to the nates, pectoral region, or other parts of the body. Cancerous tumors of considerable size, either external or of the viscera, have also been met with. Other fœtal tumors may be produced by congenital deformities, such as projection of the liver or other abdominal viscera through a deficiency of the abdominal wall; or spina bifida from imperfectly developed vertebræ. The amount of dystocia produced by such causes will, of course, vary much in proportion to the size, consistency, and accessibility of the tumor.

Wounds and Injuries of the Fœtus.—Accidents of serious gravity to the fœtus may happen from violence to which the mother has been subjected, such as falls or blows, without necessarily interfering with gestation. Many curious examples of this kind are on record. Thus a child has been born presenting a severe lacerated wound extending the whole length of the spine, where both the skin and the muscles had been torn, and which seems to have resulted from the mother having fallen in the last month of pregnancy. Similar lacerations and contusions have been observed in other parts of the body, the wounds being in various stages of cicatrization, corresponding to the lapse of time since the accident had occurred. Intra-uterine fractures are not rare, apparently arising from similar causes. In some of these cases the broken ends of the bones had united, but, from want of accurate apposition, at an acute angle, so as to give rise to much subsequent deformity. Chaussier records two cases in which there were many fractures in the same child—in one, one hundred and thirteen, and in another forty-two—which were in different stages of repair. He attributes this curious occurrence to some congenital defect in the nutrition of the bones, possibly allied to mollities ossium.[2]

Intra-uterine amputations of fœtal limbs have not unfrequently been observed. Children are occasionally born with one extremity more or

[1] Tarnier's Cazeaux, p. 865.

[2] Gazette hebdom., 1860.

less completely absent, and cases are known in which the whole four extremities were wanting (Fig. 97). The mode in which these malformations are produced has given rise to much discussion. At one time it was supposed that the deficiency of the limb was due to gangrene of the extremity, and subsequent separation of the sphacelated parts. Reuss, who has studied the whole subject very minutely,[1] considers gangrene in the unruptured ovum to be an impossibility, for that change cannot occur unless there is access of air, and when portions of the separated extremity are found *in utero*, as is often the case, they show evidences of maceration, but not of decomposition. The general belief is that these intra-uterine amputations depend on constriction of the limb by folds or bands of the amnion—most often met with when the liquor amnii is deficient in quantity—which obstruct the circulation, and thus give rise to atrophy of the part below the constriction. It has been supposed that the umbilical cord might, by encircling the limb, produce a like result. It appears doubtful, however, whether this cause is sufficient to produce complete separation of the limb, as any great amount of constriction would interfere with the circulation through the cord. Sometimes, when intra-uterine amputation occurs, the separated portion of the limb is found lying loose in the amniotic cavity, and is expelled after the child. Cases of this kind have been recorded by Martin, Chaussier, and Watkinson. More often no trace of the separated extremity can be found. The explanation probably depends upon the period of utero-gestation at which amputation took place. If it occurred at a very early period of pregnancy, before the third month, the detached portion would be minute and soft, and would easily disappear by solution. If at a later period, this could hardly happen, and the detached portion would remain *in utero*. In cases of the latter kind cicatrization of the stump has often been observed to be incomplete. Simpson pointed out the occasional existence of rudimentary fingers or toes on the stump of an amputated limb, such as are seen on the thighs in Fig. 97. These he attributed to an abortive reproduction of the separated extremity, analogous to what is observed in some of the lower animals. This explanation has been contested with much show of reason. Martin believes that the reproduction is only apparent, and that the rudimentary extremities are, in reality, instances of arrested development. The constricting agents interfered with the circulation sufficiently to arrest the growth of the limb below the site of constriction, but not sufficiently to effect complete separation. If constriction occurred at a very early stage of development, an appearance similar to that observed

FIG. 97.

Intra-uterine amputation of both arms and legs.

[1] Scanzoni's Beiträge, 1869.

by Simpson would be produced. It does not follow, however, that all cases of absence of limbs depend on intra-uterine amputations. In some cases they would appear to be the result of a spontaneous arrest of development, or of congenital monstrosity. Mr. Scott[1] relates a case in which a distinct hereditary tendency was evident, and here the deformity certainly could not have resulted from the constriction of amniotic bands. In this family the grandfather had both forearms wanting, with rudimentary fingers attached; the next generation escaped; but the grandchild had a deformity precisely similar to that of the grandfather.

[**Arrested Pullulation.**—The absence of a hand where there are rudimentary evidences of an attempt to form the thumb and fingers can be accounted for much more satisfactorily on the theory of an arrested development taking place in the latter half of the second month of embryonic life than upon the hypothetical idea that there has been first an amputation *in utero*, and then an attempt of Nature to reproduce the lost digits by a new budding process, as taught by Simpson and Annandale. More than thirty years ago I became fully satisfied that there was an inclination in Nature to repeat itself so exactly during the pullulative period of embryonic growth that cases of congenital deficiency of the thumb and fingers of a precisely similar character must from time to time present themselves to the eye of the medical observer. It so happened that three such typical cases, all exactly alike, in two boys and one girl, each being strangely without the left hand, came under my notice during a short period of years. The forearm in each ended in a well-rounded and slightly-flattened stump, from which protruded a row of pisiform nail-less bodies representing the embryonic commencement of the formation of a thumb and four fingers. I saw these subjects at different ages of infancy and childhood, and the little pea-like bodies remained the same, with the exception that they became slightly larger. In a fourth case, a boy, the finger rudiments were entirely absent, and there was an attempt to form a thumb, which was useless and about three-quarters of an inch long. The boy developed into a powerful man of six feet. Cases of the precise type of the three first named have come under the observation of medical friends.—ED.]

Death of Fœtus.—When from any cause the fœtus has died during pregnancy, it may be either soon expelled, or it may be retained *in utero* for a longer or shorter time, or even to the full period. The changes observed in such fœtuses vary considerably according to the age of the fœtus at the time of death, or the time that it has been retained *in utero*. If it die at an early period, when the tissues are very soft, it may entirely dissolve in the liquor amnii, and no trace of it may be found when the membranes are expelled. Or it may shrivel or mummify; and if this happen in a twin pregnancy, as sometimes occurs, the growing fœtus may compress and flatten the dead one against the uterine wall.

At a later period of pregnancy a dead fœtus undergoes changes

[1] Obst. Trans., 1872, vol. xiii. p. 94.

ascribed to putrefaction, but which produce appearances different from those of decomposition in animal textures exposed to the atmosphere. There is no offensive smell, as in ordinary decay. The tissues are all softened and flaccid. The more manifest changes are in the skin, the epidermis of which is separated from the cutis vera, which has a deep reddish color. This is especially apparent on the abdomen, which is flaccid, and hollow in the centre. The internal organs are much altered. The brain is diffluent and pulpy, and the cranial bones loose within the scalp. The structures of the muscles and viscera are in various stages of transformation, many having undergone fatty changes, and contain crystals of margarin and cholesterin. The extent to which these changes occur depends, in a great measure, on the length of time the fœtus has been dead, but they do not admit of our estimating with any degree of accuracy what that time has been.

The symptoms and diagnosis of the death of the fœtus may here be considered. They are, unfortunately, not very reliable. The cessation of the fœtal movements cannot be depended on, as they are frequently unfelt for days or weeks, when the child is alive and well. Sometimes the death of the fœtus is preceded by its irregular and tumultuous movements, and, in women who have been delivered of several dead children in succession, this sensation may guide us in our diagnosis. This suspicion may be confirmed by auscultation. The mere fact that we are unable, at any given time, to hear the fœtal heart will not justify an opinion that the fœtus is dead. If, however, the fœtal heart has been distinctly heard, and after one or two careful examinations, repeated at separate times, it cannot again be made out, the probability of the child being dead may be assumed. Certain changes in the mother's health have been noted in connection with the death of the fœtus, such as depression and lowness of spirits, a feeling of coldness and weight about the lower parts of the abdomen, paleness of the face, a livid circle round the eyes, irregular shiverings and feverishness, shrinking of the breasts, and diminution in the size of the abdominal tumor. All these, however, are too indefinite to justify a positive diagnosis, and they are not infrequently altogether absent. At most they can do no more than cause a suspicion as to what has happened.

CHAPTER X.

ABORTION AND PREMATURE LABOR.

Importance and Frequency of Abortion.—The premature expulsion of the fœtus is an event of great frequency. The number of fœtal lives thus lost is enormous. There are few multiparæ who have not aborted at one time or other of their lives. Hegar estimates that about one abortion occurs to every eight or ten deliveries at term. Whitehead has calculated that at least 90 per cent. of married women who lived to the change of life had aborted. The influence of this incident on the future health of the mother is also of great importance. It rarely, indeed, proves directly fatal, but it often produces great debility from the profuse loss of blood accompanying it; and it is one of the most prolific causes of uterine disease in after-life, possibly because women are apt to be more careless during convalescence than after delivery, and the proper involution of the uterus is thus more frequently interfered with.

Definition.—A not uncommon division of the subject is into *abortion*, *miscarriage*, and *premature labor*, the first name being applied to expulsion of the ovum before the end of the fourth month of utero-gestation; miscarriage, to expulsion from the end of the fourth to the end of the sixth month; and premature labor, to expulsion from the end of the sixth month to the term of pregnancy. This is, however, a needless and confusing subdivision, which leads to no practical result. It suffices to apply the term abortion or miscarriage indiscriminately to all cases in which pregnancy is terminated before the fœtus has arrived at a viable age, and premature labor to those in which there is a possibility of its survival. There is little or no hope of a fœtus living before the twenty-eighth week or seventh lunar month, and this period is therefore generally fixed on as the limit between premature labor and abortion. The rule is, however, not without an occasional, although very rare, exception. Dr. Keiller, of Edinburgh, has recorded an instance in which a fœtus was born alive at the fourth month, nine days after the mother had experienced the sensation of quickening. I myself recently attended a lady who miscarried in the fifth month of pregnancy, the child being born alive, and living for three hours. Several cases are on record in which after delivery in the sixth month the child survived and was reared. The possibility of the birth of a living child under such circumstances should be recognized, as it may give rise to legal questions of importance; but the exceptions to the ordinary rule are so rare that they need not interfere with the division of the subject usually made.

Abortion is Most Common in Multiparæ.—Multiparæ abort far more frequently than primiparæ. This is contrary to the statement in many obstetrical works. Thus, Tyler Smith says, "there seems to be a greater danger of this accident in the first pregnancy." Schroeder,[1] however, states that twenty-three multiparæ abort to three primiparæ; and Dr. Whitehead, of Manchester, who has particularly studied the subject, believes that abortion is more apt to occur after the third and fourth pregnancies, especially when these take place toward the time for the cessation of menstruation.

There can be no doubt that women who have aborted more than once are peculiarly liable to a recurrence of the accident. This can generally be traced to the existence of some predisposing cause which persists through several pregnancies, as, for example, a syphilitic taint, a

[1] Schroeder: Manual of Midwifery, p. 149.