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DECIDUA. (PATHOLOGY.)—The pathological changes occurring in the decidua during the course of pregnancy are but little known, although they play a very important part in the production of abortion and in various pathological conditions of the fœtus. The majority of the decidual changes which have been described as pathological have been in reality physiological phenomena. It must be borne in mind that the decidua, as well as the chorion, is to be regarded in the latter months of pregnancy as a senile structure which presents various evidences of physiological degeneration. Many of these, such as fatty degeneration, calcification, thrombosis, etc., have been mistaken for signs of disease, and the literature of decidual pathology is largely made up of such misconceptions. The true pathology of this membrane remains for the greater part an unexplored field.

Physiological Changes.—As in the case of the chorion, the earliest changes of senility occur in the vessels. As early as the seventh month large thrombi are formed in the sub-placental sinuses. These grow slowly toward the serotina and the intervillous spaces, but rarely extend far into the latter. The number of sinuses thus thrombosed is always relatively small under normal conditions. Giant cells are usually found in the veins so affected, appearing as early as the fifth month. These may be few in number or may completely fill the lumen of the vessel. Friedländer regarded these giant cells as being of decidual origin and entering the sinuses by diapedesis. After entrance into the vessels he believed that they adhered to the endothelium and induced the thrombosis. Further, he held that the progressive stagnation of the blood in the maternal sinuses led to a deficient oxygenation of the fœtal blood which became the exciting cause of the onset of labor. Other writers believe that the giant cells arise either from the syncytial layer of the chorion, or from the endothelium of the sinuses. During the latter months of pregnancy there is a proliferation of the intima in many of the sub-placental vessels leading to the gradual obliteration of a certain number of the sinuses, even before the beginning of labor. Since the sub-placental sinuses are as much temporary structures as is the placenta itself, they are unnecessary after labor; and like the placenta, they begin to show signs of their disappearance and decay as early as the seventh month.

Aside from the thrombosis occurring in some of its cavernous spaces, the deeper layer of the serotina does not show much change in the last months. Its cells are somewhat smaller than in the earlier stages, and are more closely packed together. Scattered areas of fatty degeneration are found in them. The upper compact layer shows more change. Its nuclei have largely disappeared, and the cell outlines are indistinct. With ordinary stains it is difficult to distinguish the boundary line between the decidua and the overlying fibrin deposit; but with Weigert's fibrin stain the necrotic cells of the uppermost layer are shown to be surrounded and separated from each other by a delicate line of fibrin. The source of this intercellular fibrin is not yet clear, though it is claimed by many to be a product of the cell degeneration. Simple necrosis, liquefaction, fatty degeneration, and a colloid-like change may all be found in the decidual cells of the upper layer and in those of the processes extending into the chorion. The fatty degeneration of the decidua is often visible to the eye as small whitish areas. Lime salts are not infrequently deposited in such degenerated cells. Small areas of leucocyte infiltration are occasionally seen scattered throughout the lower portion of the compact layer. They are, however, much less numerous than in the young serotina. The degenerative changes are most marked in the superficial layer of cells, which may be almost entirely replaced by fibrin. Beneath this the change is less advanced, and well-preserved decidual cells may be seen. It is apparent from the careful study of these changes that they begin in the most superficial layers, and gradually extending deeper involve the whole of the compact layer. On the serotinal surface there lies usually a thick layer of fibrin derived from the maternal blood. The superficial cells of the decidual processes extending into the chorion suffer a similar necrosis, and there is a formation of fibrin about and between them. The cells in the inner portions of these processes undergo a liquefaction necrosis, resulting in the formation of cystoid spaces filled with a finely granular material.

It is evident that the degeneration of the compact layer of the serotina is coincident with the thrombosis of the sub-placental sinuses, and that the two processes advance together, increasing toward term. In the last stages the placental arteries, as well as the venous sinuses, become obliterated or obstructed, and the degeneration of the serotina advances most rapidly during this time. There can be no doubt that the decidual degeneration is brought about by these vascular changes in the same way that chorionic infarction is dependent upon the changes in the chorionic vessels. It is to be noted, however, that in the chorion the small arteries are first affected, while in the case of the serotina the primary and chief changes are in the venous sinuses. The non-fibrinous infarct of the chorion may possibly be explained by the late thrombosis of the placental arteries. As a result of such thrombosis a portion of the intervillous spaces are deprived of blood, and the neighboring villi are crowded together to such a degree as to obliterate the intervillous spaces and to obstruct the circulation in the vessels of the villi. These changes lead to necrosis of the affected villi without an intervillous formation of fibrin.

Circulatory Disturbances.—The condition of the circulation in the sub-placental vessels and serotina is largely dependent upon the general state of the maternal circulation. In anæmias and various forms of general hyperæmia of the mother the circulation in the maternal placenta will show a similar condition. Local anæmia and congestion of the placental arteries and sinuses may be the result of partial obstruction or obliteration of certain of the vessels, or they may be secondary to pelvic or portal congestions. Hemorrhage from the decidua is of frequent occurrence. It may follow the death of the fœtus and the subsequent detachment of the placenta, or it may be the exciting cause of such detachment. It is in many instances impossible to fix the true relation existing between hemorrhage and abortion. The causes of decidual hemorrhage are manifold: trauma, external violence, mechanical attempts at abortion, maternal congestions, thrombosis of placental sinuses, rupture of the blood spaces of the serotina, excessive heart action, syncope, maternal albuminuria, syphilitic changes in the decidua, decidual hyperplasia, endometritis decidualis, etc. Large hemorrhages into the decidua may occur during labor. These are especially dangerous in the case of placenta prævia. In the early months of pregnancy the hemorrhage is most frequently due to rupture of the thin-walled blood-vessels surrounding the chorionic villi. The large collections of blood and blood clot found so frequently in the intervillous spaces, the so-called "placental apoplexy," are not in reality a hemorrhage since the blood lies in a blood space. In many cases the condition represents only an extreme congestion of a portion of the intervillous spaces, while in others the collection of blood may be due to a true hemorrhage into the intervillous spaces arising from ruptured vessels in the serotina. Some of the so-called "red infarcts" are apparently formed in a similar manner. Occasionally extravasations may burrow down between the layers of the decidua and escape from the uterus. The effects upon the fœtus will depend upon the amount of blood extravasated. In large hemorrhages the villi may be compressed and the fœtus asphyxiated, or the placenta may be partially or wholly stripped from the uterine wall, and the fœtus prematurely

expelled. Smaller hemorrhages may lead to disturbances of fœtal development without causing its death. Such an extravasation may become organized, partly absorbed, or encapsulated. In the latter case the liquefaction of the clot gives rise to a cyst which contains either a red, or a brown, or a clear fluid.

After the death of the fœtus the placenta may be retained for a long period of time. If hemorrhages occur into the membranes with clotting of the blood thick deposits of fibrin may be formed on and between the layers, leading to the production of a flesh-like mass which is known as *fibrin mole* or *fleshy mole*. The formation of such a mole may begin before the death of the fœtus, and may be the exciting cause of abortion. If the dead fœtus is not expelled it may be absorbed; after this the growth of the fœtal membranes may continue with or without successive hemorrhages. In the latter case a solid flesh-like cast of the uterine cavity, made up of fibrin and remains of the fœtal membranes, may ultimately be expelled. A similar process may take place in the case of retained placenta after delivery at full term, but it is of most frequent occurrence in the earliest stages of pregnancy.

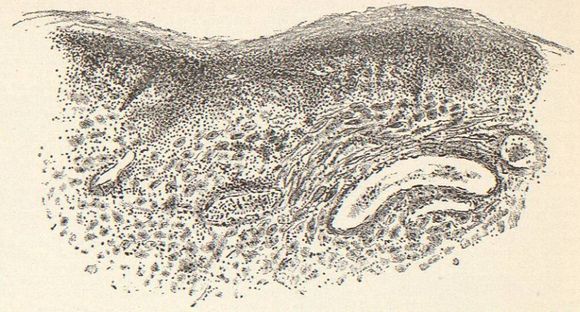

FIG. 1584.—Endometritis Deciduæ. Marked small-cell infiltration of the uppermost layers of the decidua. (After Gebhardt.)

Retrograde Changes.—Atrophy of the decidua has been described, but is of rare occurrence. Either the decidua serotina, or vera, or reflexa may show this change, singly or coincidently. As a result of such atrophy the ovum may be attached to the uterine wall by a slender pedicel, which may become so stretched that the ovum comes to lie in great part within the cervical canal. In other cases its membranes may rupture and its contents be discharged from the uterus. The changes taking place in the atrophic membrane are similar to those occurring in the decidua reflexa in the physiological atrophy of this portion of the decidua in the latter months of pregnancy. The retrograde changes, such as fatty degeneration, necrosis, calcification, etc., which occur as physiological changes in the last months, may have pathological significance when they appear at an earlier period or are more extensive than usual. They are usually the result of a premature thrombosis of the sub-placental sinuses, and are found especially in connection with maternal syphilis, nephritis, and other cachexias. Local inflammatory changes in the endometrium, hyperplastic conditions of the decidua, etc., likewise lead to a premature degeneration of the serotina. These changes when extensive and when they occur at an early stage of pregnancy may lead directly to death of the fœtus and abortion, but, as a rule, they give rise to hemorrhages which become the direct exciting cause of abortion. Pathological fatty degeneration never occurs in the decidua to any great extent, though slight degrees of this change are almost constantly present in the physiological decay of this membrane. Necrosis—both the simple form and liquefaction necrosis—is the most common retrograde change found in the decidual membranes. By many writers the death of the decidua is regarded as being more of the nature of a coagulation necrosis in which fibrin is formed from the degenerating decidual cells. It is, however, more probable that the fibrin is derived from the maternal blood, being formed upon and between the cells, so that the necrosed cells come to lie in a network of fibrin which completely replaces the intercellular substance. The cells themselves do not stain like fibrin, but in the majority of cases have a hyaline appearance and stain in a manner similar to colloid (so-called hyaline degeneration). As the intercellular fibrin contracts the cells become smaller and gradually disappear. Premature necrosis of the superficial layer of the serotina occurs, especially in syphilis acquired during the early months of pregnancy and in albuminuria. Calcification rarely is extensive enough to possess pathological significance, but occurs more frequently in syphilis, albuminuria, etc. Deposits of blood pigment may occasionally be found as the remains of old hemorrhages.

Progressive Changes.—Hyperplasia of the decidua not infrequently occurs in the form of diffuse or circumscribed thickenings. The latter are most common, and are usually associated with chronic endometritis. The general thickening occurs in association with defective development of the fœtus. Nodular and diffuse fibrous thickenings have also been described. The physiological atrophy and blending of the decidua reflexa with the vera may not take place, and the former remains as a distinct and thickened membrane. These changes are considered by many writers to be of inflammatory origin. Hemorrhages and various retrograde changes are usually associated with the different forms of hyperplasia.

Inflammation.—In the early months of pregnancy small areas of leucocyte infiltration are very frequently found in the lower layer of the serotina. In the later stages of development they are less common. Purulent inflammation of the decidua during the course of pregnancy is not of rare occurrence. It may be the result of gonorrhœal infection or of infection with pyogenic organisms following attempts at abortion or during prolonged labor. In these cases pus may be formed in the serotina and vera as well as in the chorion; a thin layer of pus covering the entire vera is sometimes found. The small-cell infiltration is found usually only in the superficial layer, while at a greater depth only isolated collections of leucocytes are seen. Acute inflammation of the decidua may occur in the course of cholera and other infections, especially in the exanthematous diseases; also, following attempts at abortion, trauma, etc. In cholera the decidua may be thickened, of a dark purple color, and contain numerous extravasations of blood (endometritis decidualis hæmorrhagica). It is probable that the same condition may be found in other acute infections. In the exanthemata premature expulsion of the fœtus not infrequently occurs at the time of the appearance of the eruption, and this has been explained by Klotz as being the result of an exanthematous inflammation of the endometrium and decidua.

The chronic forms of decidual inflammation are more frequently seen. They partake more of the nature of hyperplasias than of true inflammatory processes. They

form the most common pathological condition of the placenta, and are the most frequent cause of abortion. In general, they are characterized by an overgrowth of the decidua or some of the constituent elements of the endometrium. The origin is almost always from a pre-existing endometritis, of either gonorrhœal, or syphilitic, or non-infective nature. In some cases the death of the fœtus may be the exciting cause, the decidual changes being secondary to this event. Five forms of chronic decidual endometritis occur: the diffuse, polypoid, catarrhal, adenomatous, and cystic. In the diffuse form there is an increase in all of the elements of the decidua leading to the formation of a membrane many times thicker than the normal decidua. In the case of rapid hyperplasia death of the embryo may occur as the result of deficient nutrition, or extensive hemorrhages into the hyperplastic decidua may take place, either separating the membrane from the uterine wall or breaking through it into the fœtal membranes. The embryo may be absorbed and the decidua and remnants of fœtal membranes, together with masses of fibrin, may be expelled later as a fleshy mole. If the hyperplasia is of slow development pregnancy may go on to full term, and a living child be delivered. Various evidences of deficient development are, however, very common in these cases. The hyperplastic decidua shows a great increase in the number of decidual cells, many of which are spindle-shaped, resembling connective tissue more closely than decidua. Areas of fibrous connective tissue are found throughout the membrane, and newly formed unstriped muscle is described as occurring. Either the cellular or the connective-tissue hyperplasia may predominate. If the latter takes place to a very marked degree the condition may be termed scirrhous inflammation of the decidua. The effects of chronic decidual endometritis upon both mother and fœtus are very important. The hemorrhages may prove fatal to the former as well as to the latter. After the expulsion of the fœtus portions of the hyperplastic decidua usually remain attached to the wall, and, these continuing to grow, may either give rise to further hemorrhages or to the development of a malignant tumor, or through decomposition produce toxæmia, or lead to infection.

In the polypoid form there is in place of the diffuse thickening a localized hyperplasia in the form of scattered nodules or outgrowths (endometritis decidualis polyposa s. tuberosa). On the inner surface of the decidua there are villous-like projections 2 to 5 cm. in length, very vascular, and having a smooth surface. Between these may be seen the openings of the uterine glands, many of which are greatly dilated. The entire

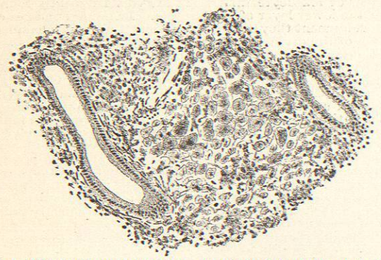

FIG. 1585.—Subinvolutio Deciduæ. An island of decidual cells in the midst of tissues of the endometrium which have undergone complete involution. (After Gebhardt.)

membrane is thickened, and there is an apparent new formation of blood-vessels. On microscopical examination the outgrowths are found to consist of decidual cells, many of which are larger than usual and possess very large nuclei. Bands of connective tissue are found throughout the membrane, especially about the glands and blood-vessels. This form occurs only in the early stages of pregnancy, and is frequently associated with a myxomatous degeneration of the chorion. Abortion usually occurs before the fourth month. Syphilis was formerly supposed to be the cause of this disease, but it is found in cases of chronic endometritis in which no syphilitic history can be obtained. The gonococcus has been found in a number of cases.

A catarrhal endometritis may either prevent conception or hinder the development of the fertilized ovum in the uterus through deficient formation of the decidua. The vera and reflexa may fail to unite, and the serotina may be very small or attached to the ovum in the form of a pedicel. The catarrhal secretion of the uterine glands in the shape of a thin, watery mucus may collect between the vera and reflexa, preventing their union (hydrorrhœa gravidarum). This fluid may be expelled from the uterus in sudden gushes, or it may dribble away for a long time without seriously affecting the course of pregnancy. If a large quantity of fluid collects uterine contractions are usually set up and abortion results. The condition is rare, occurring more frequently in multiparæ, and begins usually in the third or fourth month.

The adenomatous form of decidual endometritis takes its origin from cases of chronic glandular endometritis. With the beginning of the formation of the decidua there is at the same time a glandular hyperplasia which may be so marked as to assume the character of an adenoma. It may be general or localized. This change takes place very early, and leads very quickly to abortion. The endometrium is greatly thickened; on microscopical examination the surface of the endometrium is seen to consist of a thin layer of decidua beneath which lie the hyperplastic uterine glands. The latter are greatly enlarged and increased in number with but little intervening stroma, so that the appearance of an adenoma is presented. A similar condition occurs in the case of retained decidua after abortion or delivery, very frequently in cases of subinvolution. If there is an excessive secretion in the glands, and if this be prevented from escaping, cystic dilatation of the gland spaces may result (endometritis decidualis cystica). In these cases the decidua is thickened from an increase of decidual cells, connective tissue, and fibroblastic tissue. Numerous small cysts are scattered through it, corresponding to the dilated glands. The cystic form is found only in the early stages of pregnancy, but it is probable that it precedes the diffuse hyperplastic form, the glands being obliterated as the process advances.

The prognosis in all forms of chronic decidual endometritis is very unfavorable for the fœtus, and not wholly favorable for the mother. The disturbance of fœtal nutrition and the tendency to hemorrhage render the chances of escape from abortion very slight. As a result of the firmer attachment of the decidua to the uterine wall, retention of the membrane after abortion or delivery is especially likely to occur; and in this lies the source of greatest danger to the mother in the form of repeated hemorrhages and infection following the necrosis of the retained material. Treatment during pregnancy is of course impossible. Since the cause of these chronic forms lies in a pre-existing chronic endometritis their prevention should be attempted through the cure of the latter. The gonococcus is probably the most important etiological factor, either directly or by paving the way for secondary infections. The treatment of gonorrhœa will be, therefore, the chief means of prevention of these conditions.

Endometritis Decidualis, Post-Abortum s. Post-Partum (Retentio deciduæ, Subinvolutio deciduæ).—After normal termination of pregnancy the decidua undergoes an involution into the normal uterine stroma. This involution under normal circumstances progresses uniformly over the entire endometrium. Under certain conditions, the causes of which are as yet unknown, portions of the decidua fail of involution and retain their character long

after the expulsion of the fœtus and placenta. This is of much more frequent occurrence after abortion, in which case portions of the chorion are usually retained. Persistence of the decidua may, however, occur without retention of the fœtal membranes, though this is questioned by some writers. On the other hand, retention of the chorion is always associated with persistence of the decidua. Though the name retentio decidua has been applied to this condition, it is properly a subinvolution and not a retention, as under normal circumstances the entire decidua is not expelled from the uterus but becomes changed back into uterine stroma. To the naked eye the endometrium shows but little change in some cases, but often it is diffusely or irregularly thickened, and may present a polypoid appearance. Under the microscope two different forms may be distinguished, but these are frequently combined. In the first form, groups of large decidual cells are found scattered through the stroma of the endometrium which has resumed its normal character. The cells in the central portion of the groups are the largest, and best preserve their decidual characteristics, while those at the periphery are smaller and pass gradually into the surrounding stroma tissue so that no definite point of transition can be made out. The groups of decidual cells lie for the greater part in the upper layers of the endometrium, but are covered by surface epithelium from which they are separated by a more or less thick layer of stroma. This form of retention of the decidua is distinguished from those forms of chronic endometritis in which the stroma cells increase in size and more or less resemble the decidual cells, by the fact that the true decidual cells lie in groups and are not diffusely scattered throughout the entire endometrium. In the second form the decidual cells lie in the lower portion of the endometrium, extending even into the muscle and into the walls of the blood-vessels. This form is easily distinguished from the changes of chronic endometritis by the relation of the decidual cells to the large blood-vessels, as in chronic endometritis changes of this kind do not take place. In both forms of retentio deciduæ the endometrium shows either a glandular or an interstitial inflammation. In many cases it becomes impossible to decide as to which is the primary process. The frequent and severe hemorrhages which form the chief symptoms of retention cannot be explained by the microscopical findings. In the early stages of retention of the fœtal and decidual membranes infection with saprophytic or pyogenic organisms is likely to occur, giving rise to either putrid or septic inflammatory processes (endometritis puerperalis putrida s. septica). The putrid form is caused by various anaërobic bacteria, the Proteus vulgaris, colon bacillus, etc.; the septic form is dependent chiefly upon the streptococcus and staphylococcus. The latter condition not infrequently assumes the character of a diphtheritic inflammation.

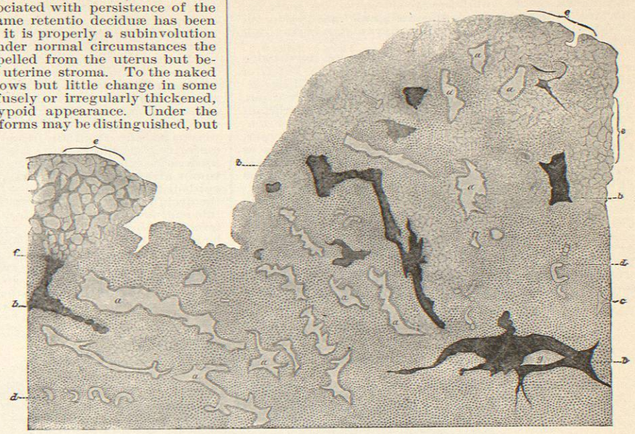

FIG. 1586.—Benign Deciduoma; Section of Periphery of Tumor. *a*, Glands; *b*, blood spaces; *c*, lymph sinus; *d*, arteriole; *e*, capillaries; *f*, junction of capillaries and blood space; *g*, island of decidual tissue in blood space. (After Klotz, *Arch. f. Gyn.*, vol. xxix.)

Tuberculosis.—Tubercle bacilli have been demonstrated in the placental sinuses when no tuberculous lesions were present in the placental tissues. In the case of decidual formation in a tuberculous endometrium the tubercles may gradually invade the decidua and later the chorion. In acute miliary tuberculosis of the mother miliary tubercles containing numerous giant cells may appear in the serotina and later extend into the decidual processes between the villi, ultimately involving the latter. As regards their formation and development decidual tubercles are in all ways similar to tubercles found elsewhere in the body. The lesion is probably of more frequent occurrence than is generally supposed.

Syphilis.—Almost all of the physiological changes, such as fatty degeneration, calcification, etc., have been ascribed to syphilis. The changes in the sub-placental sinuses have likewise been considered to be due to the same cause. There is, however, no definite relation between the occurrence of these changes and syphilitic infection. They bear the same relation to nephritis and other cachexias, in that in all of these conditions they are more extensive than they should be normally. It is to be noted that in well-marked cases of syphilitic infection, both of mother and of child, no changes may be found in the decidua. Further, the syphilitic nature of many of the supposedly specific changes in the decidua is very doubtful. A diffuse hyperplastic endometritis serotina has been described. The decidua is thickened, cloudy, and yellowish in color, and its consistence is greatly increased. In its general character this form of decidual hyperplasia (endometritis decidualis syphilitica) cannot be distinguished from the hyperplastic form of decidual endometritis occurring without syphilis. It is probable that the relation is one of coincidence. A form of decidual hyperplasia associated with the development of gummata (endometritis decidualis gummosa) has also been described by a few observers. Throughout the hyperplastic decidua there are scattered miliary or larger nodules which have a caseating centre with a periphery of leucocyte infiltration or connective tissue. The larger nodules are for the greater part composed of firm connective tissue or granulation tissue, in the centre of which there is a finely granular detritus. It is probable that fibrin masses, placental infarcts, necrotic areas, etc., have been mistaken for gummata, as the descriptions given in

some of the reported cases are not conclusive. In a general way the changes in the maternal placenta that can be ascribed to syphilis are of the same nature as those occurring in the fœtal placenta; they are of the character of senile changes occurring either prematurely or to a much greater degree than normally. Of these extensive thrombosis of the subplacental sinuses is the most important, as it gives rise to the retrograde changes in the serotina, and also most probably plays a part in chorionic infarction.

New Growths.—Hyperplastic conditions of the decidua are found in either a diffuse or a polypoid form, before or after the expulsion of the fœtus, but occurring most frequently in subinvolution of the decidua after abortion. They are also of frequent occurrence in the various forms of decidual inflammation either of specific or non-specific origin. To this class of simple decidual hyperplasia the majority of the so-called decidual polyps or benign deciduomata belong. It is doubtful if these should be regarded as neoplasms, but no distinct line of separation can be drawn between such simple hyperplasias and those whose overgrowth is so extensive as to warrant their being classed as tumors. They differ, however, from the true decidual neoplasms in that they are almost always spontaneously expelled, or undergo involution. If operated upon they do not recur, provided the removal has been complete. On the other hand, the true neoplasms arising from the decidua show a progressive growth, and do not tend to spontaneous expulsion or involution. Two forms of decidual neoplasms have been so definitely described that their position in oncology may be said to be securely fixed. The first of these is composed of decidual tissue and contains uterine glands or new glandular tissue derived from these. Its structure, therefore, resembles that of the serotina. This growth is analogous to the adenoma in its general manner of growth. It is benign, in that it does not produce mestastases, but may recur after operation if not thoroughly removed. It does not undergo spontaneous involution or expulsion, but shows a progressive growth for months after the abortion or delivery which gave it origin. In a few cases a much longer period, from one to two years, has been observed. The growth takes its origin from the islands of decidual tissue found in subinvolution of the decidua. To this form the term deciduoma has been usually applied, but the simple inflammatory hyperplasias, subinvolutions, etc., as well as the new growths arising from the chorionic epithelium, have also been called by this name. Much confusion has therefore arisen out of the unsettled state of the terminology of the neoplasms arising from the decidua and chorion. In the majority of the latest text-books the term deciduoma is used as a synonym for syncytioma, though the latter tumor arises from the syncytial layer of the chorion, is epithelial in character, and has nothing in common with the decidua, which is of mesoblastic origin. To clear up this confusion it has been suggested by Sänger that the term deciduoma be dropped, and the decidual neoplasm be known by the term, *decidual adenoma* or *adenoma deciduale*. It seems to the writer that this use of the word adenoma is also of danger in that a wrong conception of the structure of the decidual growth may be given, since the present use of the word adenoma is restricted almost wholly to epithelial tumors. In view of this it would seem better to retain the use of the word deciduoma, applying it only to this growth in the form of *deciduoma benignum*. Clinically, this growth is characterized by severe hemorrhages, secondary infections, etc. The

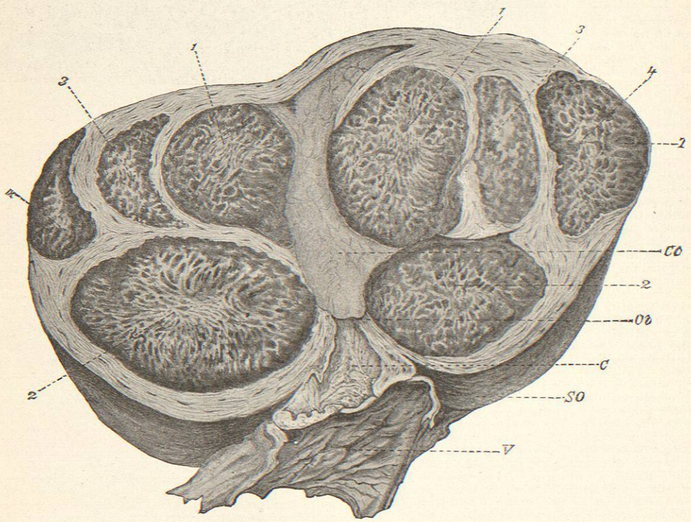

FIG. 1587.—Sarcoma Uteri Deciduo-cellulare. Uterus opened in the anterior median line, showing many tumor nodules (1, 2, 3, 4). *T*, Tumor; *Cc*, uterine cavity; *Oi*, internal os; *C*, cervix; *V*, vagina; *SO*, serosa of uterus. (After Sänger, *Arch. f. Gyn.*, vol. xliv.)

treatment consists of thorough and deep curetting. This will produce a cure, if malignant changes have not already taken place.

The second form of decidual neoplasm bears the type of a sarcoma and contains no glands. To it the names of deciduo-sarcoma or sarcoma deciduo-cellulare have been given. These terms express very satisfactorily the origin and character of the growth. This possesses the structure of a sarcoma, consisting of large oval or spindle-shaped cells with occasional giant cells, and having a very scanty intercellular substance. The cells bear a very close resemblance to decidual cells, and in some cases the origin of these cells from the decidua can be definitely made out. The tumor may form a diffuse growth over the endometrium or may develop scattered nodular masses. These frequently undergo ulceration. It may extend into the uterine wall by expansion or infiltration. Metastases are very quickly set up; these are most frequent in the vaginal walls and lungs. It is one of the most malignant forms of sarcoma on account of its rapid diffusion. Retention of the chorion with or without pathological changes in the chorionic villi may or may not take place in association with this growth. Clinically, this tumor is characterized by its development following delivery or abortion, severe hemorrhages, secondary infections, rapidly developing cachexia, evidences of metastases in lungs, etc., and very rapid course, the majority of the patients dying within six or seven months. The disease is very often mistaken for cancer or puerperal sepsis. The differential diagnosis must depend entirely upon the microscopical examination of portions of the growth removed from the uterus. Because of its very rapid growth a cure can be effected only by the earliest possible recognition of the condition and the removal of the uterus. The prevention of the growth may be accomplished by the complete removal from the uterus of all portions of retained placenta after delivery or abortion. This is of especial importance in the case of hydatid mole, since in many cases the decidual sarcoma appears to follow this condition.

Aldred Scott Warthin.

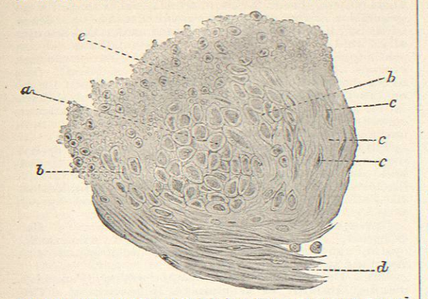

FIG. 1588.—Section of Tumor Nodule from Uterus Pictured in Preceding Figure (Sarcoma Uteri Deciduo-cellulare). *a*, Nest of decidua-like cells infiltrating muscularis; *b*, *b*, smaller nests; *c*, intermuscular connective tissue; *d*, muscle; *e*, hemorrhage. (After Sänger, *Arch. f. Gyn.*, vol. xliv.)

DECIDUOMA. See *Chorion. (Path).; Decidua. (Path.); and Syncytioma.*

DEEP ROCK SPRING.—Oswego County, New York. POST-OFFICE.—Oswego. Hotel.

Oswego is located on Lake Ontario, about fifty miles south of the head of the St. Lawrence River. It is reached by the Delaware, Lackawanna and Western, Rome, Watertown and Ogdensburg, and the New York, Ontario and Western railroads. The Deep Rock Spring was opened to the public and the water placed on the market in the spring of 1871. Since that time it has had an extensive sale, competing fairly in the markets with the most popular waters of the time. The following analysis was made by Prof. Silas H. Douglass, of the University of Michigan:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium chloride	308.18
Potassium chloride	149.08
Magnesium chloride	10.24
Calcium chloride	18.19
Silica	71.70
Sulphuric acid	Trace.
Iron protoxide	Trace.
Loss	1.78
Total	559.17

Carbonic acid gas, not determined.
Temperature of water, 50° F.

The water is strongly saline and actively diuretic without cathartic effects. It is useful in rheumatism and some forms of kidney and bladder troubles. It is claimed that the water contains a greater proportion of potassium chloride than does any other known spring. A valuable sulphur spring has been discovered in a ledge of rocks fifty-seven feet above the source of Deep Rock, and it is intended to utilize this for both drinking and bathing purposes. The city of Oswego offers unusual attractions as a place of residence during the summer. The well-known Doolittle House, adjoining the springs, has accommodations for one hundred and fifty guests.

James K. Crook.

DEERS-TONGUE. See *Coumarin.*

DEFECATION.—The residue of food digestion and other débris from the alimentary canal, after accumulating in the colon and sigmoid flexure, are discharged at more or less regular intervals. This discharge constitutes defecation. The rectum is ordinarily a closed tube, the descent of fæcal matter into it being prevented by the so-called third or superior sphincter. Its distention by fæcal matter produces the normal stimulus to peristaltic contraction and a sensation which is recognized by the individual as a call for evacuation. If the call be not promptly responded to, the rectal contents pass back, probably by a reversed peristalsis, into the sigmoid flexure, and the desire for evacuation temporarily ceases. Ordinarily the call is repeated at short intervals and with increasing urgency until it is responded to; habitual neglect of it begets a tolerance, and the rectum becomes also a reservoir of fæcal matter, and its evacuation as a result becomes difficult.

From this it is evident that defecation is largely under the control of the will, but it is not wholly so. It is, in fact, a reflex, involuntary act, aided or prevented, as the case may be, by voluntary impulses. The extrusion of fæcal matter is accomplished chiefly through the peristaltic movement of the bowel, both longitudinal and circular muscular coats taking part in it. The contraction of the circular fibres produces the peristaltic wave, while that of the longitudinal fibres gives support to the rectum and tends to diminish its length. The anal orifice is guarded by two sphincters, the outer one a voluntary muscle, the inner involuntary, being formed by a strong band of the unstriated circular coat of the bowel. The external sphincter is composed of striated fibres; but it is only to a certain extent under control of the will, for it relaxes when the impulse to evacuate becomes imperative. The musculature of the rectum is under the control of both motor and inhibitory nerve fibres. Some of these fibres come from the lumbar plexus and others from the sympathetic ganglia of the region, the inferior mesenteric and the hypogastric plexuses. The physiological centre in the lumbar cord is known as Budge's centrum anospinale. There exists also a nervous connection with one or more cerebral centres. There is, undoubtedly, an inhibitory centre, supposed to lie in the