confused, but this error is possible only when the cyst is so large as completely to fill the abdomen or the ascites is so great that there is no central area of tympany. In other cases the error arises from carelessness. The history of an ovarian cyst is far longer than that of an ascites. If the fluid in the abdomen is a transudate, it is a symptom of some disease which ought to show other symptoms as well. Usually the primary disease is of the liver, but it is possible for either a heart or a renal disease to cause an ascites without producing any œdema of the legs. The various forms of chronic peritonitis may give rise to as large collections of fluid in the abdomen, but the history is usually brief, and the constitutional symptoms of tuberculosis or carcinoma, the two common causes of chronic peritonitis, are either present already or soon develop. Exploratory puncture is a valuable aid and should be employed.

Solid Tumors of the Ovaries.—There is a large variety of these tumors, none of which presents anything especially characteristic in its clinical course. The most important are the carcinomata, the sarcomata, and those tumors which result from tuberculosis. The carcinomata grow rapidly, producing irregular nodular tumors in the pelvis and lower part of the abdomen, and accompanied by the symptoms of a chronic peritonitis, by cachexia, and by anæmia. Carcinoma and sarcoma cannot be distinguished clinically. The differentiation of these from the tumors produced by tuberculous disease is often very difficult, especially when the patient is of such an age that either might be present. A positive reaction to the Koch tuberculin test speaks for tuberculosis, but the failure of such reaction does not exclude it. Leucocytosis speaks for cancer. Before a correct diagnosis can be made, it may be found necessary to resort to an exploratory operation.

There are still other pathological conditions in the pelvis which manifest themselves as abdominal tumors; such are, for example, a collection of fluid in a Fallopian tube, a pelvic abscess, and an extra-uterine pregnancy. The resulting abdominal tumor may be of considerable size. In such instances, however, the history of the case and the existing symptoms and evidences usually render the diagnosis plain.

Tumors of the Colon.

These tumors, irrespective of their nature, induce alterations in the character and frequency of the movements of the bowels.

Fecal Tumors.—These are very common, especially in women, and have been the source of many embarrassing errors, all of which could have been avoided if a thorough evacuation of the bowels had first been secured. The fact that the patient's bowels have moved daily should not lead to the neglect of this precautionary measure, for the fæces may accumulate in large masses even when the bowels move daily.

The fæces tend to accumulate in the flexures of the colon—the sigmoid, the splenic, and the hepatic flexures—and in the cæcum, but they may accumulate anywhere in the course of the large intestine. The resulting tumor may be of large size, and its outlines are usually of irregular shape. While it possesses a certain degree of solidity, it can generally be moulded into a different shape, and this new shape will remain permanently. These tumors may possess considerable motility. According to the different sites which they occupy they may simulate a great variety of pathological conditions, but in all such instances the simple evacuation of the bowels will quickly clear up the diagnosis.

Gas in the Colon.—This may cause a great distention of the abdomen, and this enlargement, at least at first, is limited to its outer and upper portions, the central portion being left free. The fact that the swelling is due to gas is shown at once by percussion. These accumulations of gas are often of great significance in cases of intestinal obstruction, giving as they do some clew to the site of the obstruction; it being evident that the lower the obstruction the greater will be the portion of the colon distended. The degree of distention depends mainly upon the amount of gas, but the resistance of the intestinal walls is also important, and when they are weak and have lost their tone—as, for example, in cases of generalized peritonitis—the distention is often extreme. Usually this distention of the colon with gas is accompanied by a like condition in the small intestines.

Cancer of the Colon.—The clinical picture includes pain, which is both localized and radiating, and which often occurs in the form of attacks of colic. In most cases there is constipation, which may gradually increase even to the point of complete obstruction; but in some cases there may be diarrhœa. The stools usually become small and ribbon-like, and are often mixed with mucus, blood, and pus, and sometimes contain fragments of the tumor tissue. These local symptoms are accompanied by the secondary anæmia and cachexia which are common to carcinoma, no matter what organ it may involve.

The presence of a tumor which can be felt is by all odds the most important symptom; and while it does not exist in all cases, it certainly does in the great majority of them. The size of the tumor varies, and may reach that of an adult head. It is hard, irregularly round or cylindrical in shape, and furnished with a smooth or nodular surface. As a rule it is moderately tender, but it may be extremely tender in certain cases.

The tumor is generally very movable, especially when it involves the sigmoid flexure or the transverse colon; but it may also be movable when it involves the cæcum or either of the longitudinal portions of the colon. Such tumors may be moved by the hand of the examiner, by the peristaltic movements of the intestines, by the force of gravity, and by the respiratory motions. The passive motility is most marked in the case of tumors of the sigmoid flexure and of the transverse colon, on account of the greater length of their mesocolon. The displacements due to the force of gravity are often considerable and may render the diagnosis quite difficult, for the reason that the tumor may be found occupying a position remote from the normal site of the colon. Thus, for example, a tumor of the transverse colon may lie at the pelvic inlet, or one of the sigmoid flexure may lie close to the cæcum.

The accumulation of the fæces above the point where the lumen is narrowed by the carcinoma leads to frequent errors in the matter of estimating the size of the new growth. These fecal masses may feel as hard, firm, and irregular as the cancer itself, and the palpating finger may not be able to distinguish the one from the other. In such cases, as in those in which it is necessary to distinguish between the fecal mass and other forms of tumor, vigorous and repeated purgation, and flushing of the colon, must be practised.

Peritoneal exudates, especially those about the appendix, may be extremely difficult to distinguish from carcinoma of the cæcum. They may form hard and irregular tumors, which may obstruct the intestinal canal and may cause bloody and purulent stools. The presence of fever and an œdematous condition of the skin, taken in connection with the history of the case, will point to peritonitis.

Tumors of the transverse colon, because of their close anatomical relations to the stomach, duodenum, and pancreas, may be confused with tumors of these organs. The symptoms of tumors of the colon are chiefly disturbances in defecation, such as constipation or diarrhœa; bloody, mucous, or purulent stools; and ribbon-like form of the latter. These tumors are also more movable than are, as a rule, the tumors of neighboring organs. Distention of the colon from below with gas or fluid can be followed upward to the tumor mass, where it is stopped or retarded. Inflation of the stomach throws the tumor downward and forward.

In cases in which the tumors have migrated from the normal location of the viscus, their relations to the colon can be demonstrated by inflation of the colon.

Tumors of the sigmoid flexure may be confused with

tumors arising from the ovaries, tubes, and peri-uterine tissues, but the symptoms of intestinal disturbances are more marked here than in the case of tumors situated higher up. A careful physical examination will reveal differences between these different conditions.

Tumors situated lower down, as in the rectum, are not abdominal tumors, but they have so important a bearing upon them that it should again be stated that in all cases which are in the least obscure, even when there are no symptoms pointing directly to the rectum, the latter should be examined.

Appendicular Abscesses.

These are often of large size. Disease of the appendix may cause an abscess to form not merely in the immediate vicinity of that organ, but also in some remote part of the abdomen. These more remotely situated abscesses have been considered in the paragraphs devoted to localized and encapsulated peritonitis, but it still remains to mention the abscesses in the region of the appendix. While it is true that the diagnosis of appendicitis previous to the formation of a tumor is often difficult, after this has happened the diagnosis is easy. The size, shape, and exact location of the tumor are subject to wide variations, but the history of a sudden onset and the existence of localized pain, associated with gastro-intestinal disturbances, with a chill, and with elevated temperature, suffice to show the nature of the process.

Abscesses in this region arising from other structures are encountered, but they are decidedly less common than the appendicular abscesses. Those which develop in the female genitalia are frequent, but the history shows disturbances in the functions of these organs and opportunities for their infection. These facts, taken in conjunction with the results of the pelvic examination, suffice for making the differential diagnosis. Sometimes gravitation abscesses due to disease of the spine are mistaken for appendicular abscesses, but this error may be avoided by examining the spine and by noting the absence of the usual history of appendicitis.

Tumors of the Abdominal Wall.

All forms of tumors may occur in this part of the body, but their relations to the abdominal walls are so manifest that they need no consideration here.

Robert B. Preble.

ABENAKIS SPRINGS.—Location.—Near St. François du Lac, Quebec.

Post-Office.—Abenakis Springs, Quebec.

Hotel.—The Abenakis House.

Access.—From Montreal, by Richelieu and Ontario Navigation Co., by Grand Trunk and South Shore railways to Sorel, thence by boat to the springs. For the season of 1900 the South Shore Railway will be running direct to the springs.

Analysis (J. Baker Edwards).—Total saline solids, 110.3 grains to the pint. These are chiefly chlorides of sodium, magnesium, calcium, and potassium, with traces of lithium. The water also contains traces of bromides, iodides, and phosphates. It is very lightly carbonated.

A second spring is mildly sulphurated.

These springs are pleasantly situated on the west bank of the St. Francis River, near its confluence with the St. Lawrence, sixty miles east of Montreal. The surrounding country is elevated and dry and well settled. The hotel is new and well ventilated, possesses all modern conveniences, and is well managed. Hot and cold baths are supplied.

Beaumont Small.

ABERYSTWITH.—A much-frequented seaside resort on the coast of Wales. The town of Aberystwith lies on the shore of Cardigan Bay; its population, in 1890, was 6,650, it possesses a fine beach; has excellent hotel accommodations; and, situated as it is in the midst of some of the most attractive scenery of Wales, the excursions into the surrounding country are very enjoyable. Concerning the climate of Aberystwith, the writer is unable to present accurate data for the place itself, but the subjoined table, copied from Hann's "Handbuch der Klimatologie," may serve to give some idea of its temperature during the colder months of the year. Llandudno lying some 75 miles north of Aberystwith, and Barnstaple lying about 125 miles to the south, both of which places have a similar exposure to that of Aberystwith, it is fair to assume that the temperature of the latter place differs but little from that of either of the above-mentioned towns, whose average temperature is given by Dr. Hann. It would therefore appear that the winter temperature of Aberystwith must be little colder than that of Ventnor in the Isle of Wight, the figures for which latter resort are also quoted from Hann's table for purposes of comparison.

Name of Place.	N. Lat.	Nov.	Dec.	Jan.	Feb.	Mar.
Llandudno.....	53° 21′	44.96°	42.44°	41.72°	42.44°	43.70°
Barnstaple.....	51° 5′	45.50°	42.62°	42.26°	43.34°	44.96°
Ventnor.....	50° 35′	46.22°	43.16°	41.72°	42.62°	44.24°
Aberystwith ...	52° 25′					

Huntington Richards.

ABIETIC ACID ($C_{44}H_{64}O_5$).—An organic acid, which, in its anhydrous state, chiefly composes common rosin. It also occurs in many other coniferous plants.—*H. H. R.*

ABORTION.—While most Continental writers apply the term abortion to all cases in which the product of conception is expelled from the uterus at any time preceding the period at which the fœtus becomes viable, that is to say, before the seventh calendar month of gestation in the human subject, many American and English writers make a distinction between abortion and miscarriage, restricting the former term to the expulsion of the ovum prior to the fifth month, and applying the latter to such expulsion between the fourth and the seventh months. This distinction, although more or less arbitrary, has some practical justification, inasmuch as abortion, thus defined, differs notably in several particulars from the process of parturition at term—a difference that becomes trifling in the case of miscarriage. It is well for the practitioner to use the word miscarriage when talking to patients, for women seem to have an aversion to the term abortion. Certain qualifying words are occasionally added, such as "ovular," "embryonal," and "fœtal," but they are of little real significance.

Causes.—These attach either to mechanical injuries to the ovum or its uterine attachment, to morbid conditions of the ovum, or to diseases of the maternal organism. Under the first head must be included not only direct traumatism, but also hemorrhages between the fœtal and the maternal layers of the placenta, whether due to violence, such as falls, blows, and the like, or to a diseased state in either the mother or the ovum; the latter, of course, falling also under one of the remaining heads. Strictly speaking, indeed, the immediate cause of almost every abortion is some abnormal state of the ovum resulting in the death of the embryo, but this in turn may be due to some defect in the maternal organism, or, for that matter, to disease in the father, as exemplified by the frequency with which abortion takes place as the result of syphilitic contamination of one or the other of the parents. Habitual abortion, it is well known, raises the presumption of syphilis. As regards pathological conditions of the ovum, it is generally to disease of the placenta, or a crippling of its respiratory and nutritive functions by effused blood, that the death of the embryo is to be traced, although cases are not wanting in which the circulation in the umbilical vessels has been so interfered with as to produce the same result.

In so far as the mother's system is at fault, much stress was laid by the older writers on the "habit of abortion." It was taught that when several successive pregnancies

in the same subject had ended in abortion, no matter what the cause, a habit was thereby established by virtue of which there was a tendency for subsequent pregnancies to end in the same way, and at about the same period, even if the original causes were no longer operative. There may be some truth in this doctrine, but it certainly has not now the hold upon medical opinion that it had formerly. The exanthematous fevers, it is well known, and particularly smallpox, are prone to give rise to abortion, either by infecting the embryo, or by the tendency to hemorrhages, uterine among the others, to which they give rise. Apart from these acute diseases, it is possible that various depraved conditions of health on the part of the mother may occasion abortion, but on this score our precise knowledge is meagre. There are certain medicinal substances that, when taken into the mother's system, may induce uterine contraction, and thus bring about the premature expulsion of the ovum, such as spurred grain (generally ergot of rye) and cotton-root. Excessive purgation also may lead to the same result. Surgical operations done on pregnant women have been supposed to involve grave risk of abortion, but evidence has been accumulating of late years to show that this danger has been much overrated. A striking example is seen in the frequency with which even so serious an operation as ovariotomy is performed during pregnancy without interrupting the process of gestation.

Various morbid conditions of the uterus and its surroundings, however, are justly credited with producing a tendency to abortion, but, with regard to one of them, it seems to me that more has been assumed than the facts warrant. I refer to laceration of the cervix, whereby a lack of retentive power is said to be set up. It cannot be denied that lacerations are often accompanied by conditions unfavorable to the due continuance of gestation, or that they tend to keep up such conditions, even if not directly chargeable with their production; but this is quite a different matter from admitting a loss of mechanical retentive power in the cervix as a cause of abortion, for it should be borne in mind that the ovum maintains its position in the uterus by the implantation of its chorionic villi in the uterine mucous membrane, and not in any sense by resting on a support beneath, as on a shelf.

Abortion induced for therapeutical purposes will be found treated of under the head of *Labor, Premature Induction of*.

Frequency.—Although abortion does not figure prominently in the statistical lists of public institutions, since it is only under unusual circumstances that women betake themselves to a hospital during the process, the general experience of family practitioners shows that its occurrence is common. Add to the cases they are called upon to treat those which are brought to their knowledge long after they have taken place, while questioning patients as to their past history, and allowing for those that are concealed, as well as for those as to which there is an honest feeling of doubt (since it is unquestionable that many abortions occur during the very early weeks of gestation, before the existence of that condition is suspected, and are mistaken for a mere unusually copious and painful menstruation), and we find ourselves obliged to admit that abortion is by no means of uncommon occurrence. As to the period of gestation at which it oftenest takes place, the experience of most writers is to the effect that it is on the completion of two and a half or three months of gestation, leaving out of account the very early abortions before alluded to, since they are involved in so much uncertainty that it is impracticable to estimate their frequency with any approach to precision.

Symptoms and Diagnosis.—Sometimes the ovum is cast off rapidly, with scarcely a symptom beyond a sharp onset of abdominal pain, and a few gushes of blood. In such cases, either the diagnosis is established very promptly, or else it is never made with certainty; but it never rests on symptoms. These cases, however, are exceptional. Usually a considerable period is occupied by certain symptoms pointing to a disturbance going on within the pelvis, notably, uterine hemorrhage and pains like those of labor. When these two phenomena are found to coexist in a marked degree in a woman supposed to be pregnant, the inference that an abortion is impending presents itself at once, and most commonly it will be justified by the event. But such is not always the case. Uterine hemorrhage, or at least hemorrhage from the cervix, is not very uncommon in pregnant women who go to full term, depending generally on antecedent uterine disease. Let one of these hemorrhages coincide with an attack of colic, or of lumbago even, and the symptoms that ordinarily usher in an abortion may be very closely counterfeited. It may even happen that what, in a certain sense, may be called a product of conception, may be expelled from the uterus, and yet no abortion takes place. Reference is here had to the decidua that is commonly cast off from the uterus in cases of extra-uterine pregnancy, a condition that is most frequently accompanied, too, by hemorrhage.

Still, with every allowance for these exceptional occurrences, the fact remains that paroxysmal uterine pain, accompanied by a flow of blood from the vagina, almost invariably, when met with in a pregnant woman, presages the premature expulsion of the ovum. This suspicion once aroused in the practitioner's mind, the first thing to be settled is the question of the existence of pregnancy. The diagnosis of pregnancy will be found treated of elsewhere in this work, and, therefore, it will not now be dwelt upon. Nor, for practical purposes, is it necessary to give much more consideration to the diagnosis of threatened abortion. The practical rule should be, in all cases in which the two symptoms, uterine pain and uterine hemorrhage, are marked in a pregnant woman, to treat her as if an abortion were impending. There are, indeed, certain cases of uterine disease that may simulate abortion very closely—notably cases of submucous uterine tumors so situated and so attached as to cause expulsive pains by the impediment they may offer to the escape of the flow of blood to which their presence gives rise. In such instances, however, we shall usually be able to get the history of past occurrences of the sort—a history to be contrasted with the sharp picture of suspended menstruation followed by a profuse and painful flow in a woman previously free from such troubles. A more difficult problem is presented in cases in which an abortion is really in process, but has been arrested in its course. Perhaps the simplest form of this condition is the so-called "cervical pregnancy" of certain German writers, in which the ovum is detached from its connection with the uterine wall, and is forced down into the cervical canal, where it is retained in consequence of a failure of the os externum to dilate, or simply by reason of a suspension of the uterine contractions. These cases commonly offer no special diagnostic difficulty, and, the retention being but transitory, any doubt is speedily cleared up. A more common irregularity is the rupture of the fœtal membranes and the escape of the fœtus, either unperceived or unacknowledged, before medical aid is summoned, the placenta still being retained. Under such circumstances, it happens not infrequently that the patient resumes her ordinary course of life, seeking treatment, if at all, only on account of a uterine discharge, which may not even be bloody. In such instances the uterus will be found enlarged and especially elongated, freely movable, free from tenderness, and with nothing to account for its enlargement and its peculiar shape save the supposition of an incomplete abortion, and usually the question can speedily be settled by giving ergot—a practice quite safe under such circumstances. It is scarcely necessary to add that, in all cases of suspected abortion, everything expelled from the vagina should be saved for examination. In the absence of the embryo, the recognition of chorionic villi will be decisive. These will often be found on the inner side of the baglike structure expelled, the membranes having been turned inside out in the process of expulsion. In very early abortions the ovum is usually cast off entire.

Prognosis and Sequelæ.—If we disregard the fœtus, which is necessarily sacrificed, the prognosis for the

mother is always a matter of some doubt, but generally, provided the case is well managed, favorable. The immediate danger is from hemorrhage, which ceases on the complete evacuation of the uterus; next, and much more to be feared, is the risk of septic fever from the absorption of decomposing portions of the ovum retained in the uterus; these perils passed, inflammatory complications, subinvolution, and the like are still to be feared. But very few women die from the direct effects of hemorrhage occasioned by abortion, but many are exsanguinated to a degree that materially deteriorates their health; more often they succumb to septic absorption. The acute inflammatory sequelæ may be either peritonitis, cellulitis, oöphoritis, or any one of the various forms of metritis. Aside from the part played by mild septic contamination, these affections are largely dependent on the cause of the abortion, being uncommon in cases not occasioned by instrumental interference. On the whole, it may be said that the great majority of women escape a fatal result. At the same time, abortion is one of the most fertile causes of chronic pelvic disease; usually, however, these consequences may be avoided by careful treatment.

Treatment.—This resolves itself into the prevention of abortion, the management of the process, and the after-treatment. If we admit the "habit" of abortion, we must usually look for its solution in some degeneration of the placenta, whereby it becomes unfitted to carry on the processes of respiration and nutrition for the embryo. This occurrence may be due to syphilis; in that case mercurial treatment affords the main chance of success; the corrosive chloride of mercury in doses of from one-thirty-second to one-twenty-fourth of a grain, three times a day, will commonly be found to afford all the advantage that is to be gained in this direction. In the absence of syphilitic infection, some obstetricians believe that an error of hæmatosis is often at the bottom of repeated abortions, and on this theory the administration of potassium chlorate has been recommended. I am not aware, either that the theory is well founded or that the remedy is of any value; still, with proper precaution, there can be no objection to its use—that precaution being to guard against the injurious effects of the drug upon the kidneys; and, therefore, to avoid large doses, and to abstain from them particularly in cases in which the pregnancy is somewhat advanced, since the latter months of gestation are apt to be fraught with more or less interference with the renal function. As for the use of so-called uterine sedatives, it is not to be thought of until the process of abortion is actually threatened. Of course, such patients as are now referred to should be instructed to refrain from all the excesses and irregularities that have been mentioned as among the exciting causes of abortion.

Suppose, however, that symptoms are present showing that an abortion is imminent. In many instances the process may be prevented, and the expectation of success should not be abandoned until there is physical evidence that the expulsion of the ovum is going on. No amount of hemorrhage and no amount of pain, within ordinary bounds, should be taken in themselves as rendering attempts at prevention absolutely hopeless. Perfect rest is to be enjoined, but the low diet and cooling drinks of bygone times are not to be depended upon in the slightest; the moderate use of opium and the application of heat to the spinal column, at the junction of the dorsal with the lumbar portions, are the most trustworthy measures. Theoretically, we may admit that ergot may sometimes be useful, by checking a hemorrhage that might detach the placenta, but, practically, there is such danger of its inducing uterine contraction that it must be regarded as at best but a doubtful remedy. The use of viburnum prunifolium has of late years been recommended as a uterine sedative, and there is respectable testimony in its behalf. It should be given in doses of half a teaspoonful of the fluid extract every three hours. To mitigate its disgusting taste, it may be combined with an equal amount of tincture of cinnamon.

When it has once become evident that abortion must take place, the safe conduct of the case calls for close supervision; but, even then, discretion is usually more to be advised than activity. Ordinarily, manual interference is quite unnecessary, beyond what may be needed to keep the physician informed of the progress made, and to check hemorrhage. The utmost pains should be taken to maintain the integrity of the ovum as long as possible, for when it is expelled entire there is commonly an end to all anxiety. Herein, in great measure, lies the safety of accidental abortions as compared with those induced by criminal practices, in which the fœtal envelopes are almost always punctured, with the result of allowing the embryo to be cast off early in the process of abortion, while the secundines remain behind, a shapeless mass, upon which the uterus has to act at a great mechanical disadvantage. So long as rupture of the membranes can be prevented, our interference should be limited to controlling pain and hemorrhage; an aseptic vaginal tampon, properly introduced, may always be relied upon to fulfil the latter indication. It should be inserted leisurely and methodically, with the aid of a Sims speculum, and generally it should be removed at the end of twelve hours, when a fresh one may be applied, if necessary, after treating the vagina with an antiseptic douche. To allay excessive pain, there is nothing equal to opium, but it should not be pushed to narcotism or to such an extent as to abolish uterine action; ergot may properly be given if the hemorrhage is excessive and accompanied by inertia, but the more its use is avoided, the better will be the results on the whole. It is better to rely on the tampon, and that of itself stimulates uterine contraction.

If, unfortunately, the sac of the ovum has been emptied of its contents, and the secundines are retained, the question of their removal will come up. There are extremists who are given to energetic interference in all such cases. On the other hand, the timorous trust too long to nature. In such a case, as in most others, the middle course is followed by the judicious. The best practice seems to be not to resort to forcible removal of the remnants of the ovum unless there are particular reasons for doing so. These reasons are for the most part: (1) Signs of septic changes; (2) the undue continuance of hemorrhage. Under either of these circumstances there should be no hesitation; but the operation should be done without instruments, if possible. In some cases, however, a wire curette is necessary. The patient should be anæsthetized, and, as she lies across the bed, on her back, with the hips brought well to the edge of the bed, the operator, who has previously rendered his hands and the parts about the patient's pudenda thoroughly aseptic, should pass one or more of his fingers as far as may be necessary into the uterine cavity and tease away the retained portions of the ovum. The work will be decidedly facilitated if the uterus is gently but firmly depressed by an assistant, who should make pressure on it through the abdominal wall. As a preliminary step, dilatation of the cervix may be necessary, but, as a rule, this should not be accomplished with tents, whether of sponge or of any other material that expands on imbibing moisture. If the fingers will not answer, graduated metallic or hard-rubber dilators should be employed, and, when they are used, the operator should himself make the counter-pressure on the fundus. After the operation is finished, the uterus should be washed out with an antiseptic solution, perferably a straw-colored mixture of tincture of iodine and water, injected through a double cannula.

The after-treatment in cases of abortion hinges chiefly upon enforcing rest for a length of time equal to that usually adopted after labor at term. The special indications do not differ from those met with after ordinary parturition, except that the breasts are not apt to give trouble.

Missed Abortion.—This term was applied by the late Prof. J. Matthews Duncan, of Edinburgh, to the long-continued retention of the dead ovum in the uterus, where it becomes macerated or mummified, and whence it is finally expelled.

Frank P. Foster.

ABORTION, CRIMINAL.—In most, perhaps all, of the United States will be found statutes making it a crime to produce, or to attempt to produce, an abortion or miscarriage of a woman by artificial means. In a few this applies only to attempts in the cases of women actually pregnant; but inasmuch as crime consists of a combination of a forbidden act and a wilful and unlawful intent, it is both reasonable and just that an attempt to produce an abortion should be prohibited even when the woman is not actually pregnant, although she and the perpetrator think she is. In many of the statutes will be found saving clauses freeing from criminal liability the person who produces a miscarriage by artificial means, under circumstances from which it must appear that the fœtus is dead or that it is necessary to save the mother. It is suggested as a precautionary measure to any medical practitioner who contemplates arresting gestation, in order to avoid suspicion, to consult some other member of the profession of unquestioned standing, and to obtain the consent or approbation of some one or more of the relatives of the woman.

The statute of Pennsylvania is a good example of the best of those passed in this country. It is as follows:

1. "If any person shall unlawfully administer to any woman, pregnant or quick with child, or supposed and believed to be pregnant or quick with child, any drug, poison, or any substance whatsoever, or shall unlawfully use any instrument or other means whatsoever, with the intent to procure the miscarriage of such woman, and such woman, or any child with which she may be quick, shall die in consequence of either of said unlawful acts, the person so offending shall be guilty of felony, and shall be sentenced to pay a fine, not exceeding five hundred dollars, and to undergo an imprisonment by separate or solitary confinement at labor, not exceeding seven years."

2. "If any person, with intent to procure the miscarriage of a woman, shall unlawfully administer to her any poison, drug, or substance whatsoever, or shall unlawfully use any instrument or other means whatsoever, with the like intent, such person shall be guilty of felony, and being thereof convicted, shall be sentenced to pay a fine, not exceeding five hundred dollars, and undergo an imprisonment by separate or solitary confinement at labor, not exceeding three years."

As a practical matter, it is but rarely that the prosecuting power has the opportunity of invoking this law against a violator of it, for the reason that in all cases of criminal abortion the operation is performed, or the drug is administered, at the request, or it may be the earnest solicitation, of the woman herself, who for this reason is as cautious to avoid detection as is the perpetrator of the crime. It will be found that almost all of the cases of criminal abortion which have proceeded as far as indictment and trial, are those in which the patient has died from the effects of the operation or the administration of the drug. Even in these cases it has been a rare experience to obtain a conviction because of the secrecy with which this crime is committed, resulting usually in the absence of evidence of those facts which can be used against the culprit. Persons who commit offences deliberately always avoid or destroy those circumstances which are incriminating, so far as is possible.

Irrespective of the above-mentioned statutes, both in England and in this country one who administers to a pregnant woman a drug, or employs upon her an instrument for the purpose of procuring a miscarriage, in consequence of which she dies, or the child dies after birth, by reason of being prematurely delivered, is guilty of murder. The culprit will be indicted for murder or manslaughter, first because any inferior grade of crime of which he may be guilty will be merged in the felonious homicide, which in the eyes of the law is considered the gravest of all offences; and secondly, it may be that a dying deposition has been obtained from the patient.

It has been held that if there be no intent to kill, or to inflict grievous bodily harm, and the means employed be not dangerous, although used for an unlawful purpose, the crime, when death ensues, may be manslaughter, which is an inferior grade of homicide; otherwise the crime will be murder, and may render the accused, if convicted, liable to the death penalty. It is suggested, however, that any known means, when used for this purpose, will be dangerous and should be so considered. This question is really dependent upon the judgment of the criminal prosecutor, for it is always competent for him, unless he is restricted by some statutory provision, to elect to have the prisoner indicted for the inferior grade of the offence, and abandon, on behalf of the state, the superior grade.

When a reputable physician takes charge of a patient upon whom he discovers an abortion has been performed, and who subsequently dies, he is bound by law to certify the cause of death to the Health Department. In this it may be necessary for him to disclose the fact of the perpetration of a crime; but is it his duty to inform the police authorities as soon as he has discovered the crime? This is an ethical question which need not be discussed here—it is a proposition which each physician should consider for himself. Auxiliary to it is this question: Should he, when the opportunity arises, obtain from the patient a statement which could be used as a dying deposition in a criminal prosecution against the abortionist?

Dying Depositions.—For the benefit of the physician who is willing to aid the State in detecting the perpetrator of this nefarious crime, it may be stated that if the patient dies and the perpetrator of the abortion is charged with either murder or manslaughter, it will be admissible to offer in evidence the dying declaration of the patient, if she made one. Statements made under such circumstances are entitled to great weight. It has been wisely said by an eminent English jurist, Lord Chief Baron Eyre, "that such declarations are made in extremity, when the party is at the point of death, and when every hope of this world is gone; when every motive to falsehood is silenced, and the mind is induced by the most powerful considerations to speak the truth; a situation so solemn and so awful is considered by the law as creating an obligation equal to that which is imposed by a positive oath in a court of justice." Such declarations are admissible in evidence only in those cases in which the indictment charges the culprit with the murder or manslaughter of the deceased, and not in those in which the gravamen of the charge is a violation of one of the above-mentioned abortion statutes. The declaration should also be confined to a statement of the circumstances of the death, *i.e.*, the person who performed the operation, the method, time, and place of performance, and such other facts as are germane to these.

To render such a declaration admissible in evidence, it is requisite that the declarant should be in actual danger of death at the time it is made, that she should fully realize her impending danger, and that death should actually ensue. It is not necessary that the declarant should state that she realizes that her speedy demise is impending; it is sufficient if it satisfactorily appears from any other circumstances, such as taking leave of her relatives, or receiving extreme unction and the like. If, however, she has any hope of recovery, no matter how slight, such testimony will be inadmissible, though death might speedily ensue. Such a declaration was rejected where the dying person stated: "I have no hope of recovery, unless it be the will of God"; it being held by the court that such statement indicated that all hope had not been abandoned. It need not be under oath, as the solemnity of the occasion is held to be equivalent to the sanctity of an oath. It may be taken orally, but if reduced to writing, it should be carefully preserved and produced at the proper time. It should be confined to a statement of facts, not theories or opinions.

Criminality of the Act.—So far as the culpability of the act is concerned, it is immaterial whether or not quickening has occurred, and whether or not the fœtus *in utero* is dead, unless there is a saving clause in the abortion statute as above stated. The criminality is just as great on the day of conception as at any other period of

gestation. Nor is it a defence or excuse to the criminal charge that the mother consented to, or solicited the performance of, the abortion. It has been decided by some courts that a woman who consents to the performance of an abortion is an accomplice, by others that she is not, but this is a purely legal question. The rule of law generally adhered to is, that where a witness is held to be an accomplice there should be some corroboration of her testimony in order to justify a conviction of the accused.

Questions in Cases of Fœticide.—In every case of fœticide the important questions for consideration are:

1. Has the fœtus *in utero* been destroyed?
2. Has this been produced by natural or artificial causes?
3. If by artificial means, was the act justifiable or criminal?

In considering the first question an examination should be made of the clots and other substances expelled from the genital organs, for the purpose of ascertaining if they contain any of the products of conception. If the fœtus be found it will be necessary to determine, if possible, if it was born alive; if so, its probable age and the cause of its death. A careful scrutiny of it may disclose punctures, wounds, or injuries which indicate the unlawful use of an instrument.

If the fœtus is not found the expelled substances should be examined under water, as an ovum, if one is present, is more easily discovered in this way. Nor ought the investigator trust to the naked eye, as much may be lost without the use of a microscope. When the criminal operation is performed in the early stages of pregnancy, the ovum is frequently expelled intact; after the formation of the placenta, the extrusion of the ovum usually precedes that of the placenta, the time intervening being variable, ranging from hours to weeks or months.

Did the abortion result from natural or artificial causes?—Both criminal and spontaneous abortion occur generally about the end of the third month. The symptoms discovered will vary with the period of gestation and the time, since the performance of the operation, at which the examination is made. When the operation is performed in the early stages of gestation, the appearances are not different from those in cases of tumors and some other troubles. The nearer the period is to full term, the greater will be the laceration of the uterus and vagina.

If death has resulted, a post-mortem examination will usually determine this question with certainty. An examination of the woman while living will probably be uncertain in its results, unless the evidence of instrumental interference is palpable or the woman is frank in her statement of the case. Finally, when drugs are used as abortifacients even the post-mortem may baffle the investigator. The most popular means of attempting criminal abortion is by aid of some instrument, for the reason that unless there is a strong predisposition on the part of the woman to abort, the result can rarely be accomplished by means of drugs. Among the many means in use for this purpose, according to reported cases, are: repeated and copious blood-lettings, drastic emetics and purgatives, ergot, cotton-root, savin, tansy, pennyroyal, rue. While any of these means, in a woman disposed to miscarry, may produce the desired result, in most instances it will be uncertain. The most effective drug for this purpose, according to cases reported, is ergot. Another method sometimes successful is the dilatation of the os uteri by means of a sponge tent. The introduction of some instrument into the uterus so as to rupture the membranes is the only certain method of producing contraction of the uterus and thus causing the extrusion of its contents.

In every case these methods of treatment will be accompanied with danger to the mother, and not infrequently they result in the mother's death without effecting a discharge of the fœtus.

The production of abortion being both immoral and criminal, except where the exigencies of the case require it as before mentioned, the practice in prohibited cases is confined to medical men of low professional standing, midwives, and other unskilful persons. It is this, no doubt, which makes the operation unusually dangerous. Were this branch of practice reputable, when conducted by a competent physician, according to the principles of modern surgery, it would result fatally in a much smaller number of cases. Just what percentage of these cases result fatally it is difficult to ascertain because of the clandestine method of treating them.

It has been noticed, even in cases of natural abortion, that as the process of gestation approaches its full term the muscles of the uterus grow stronger and are able to fulfil their function by contracting not only upon the contents of the womb before delivery, but also upon the bleeding vessels afterward. In cases of abortion in early stages of pregnancy there is greater danger of hemorrhage and of septic diseases such as pyæmia and puerperal peritonitis, because these muscles respond slowly and thus leave the uterine canal open to the introduction of germs and other foreign matter.

When consulted in a suspicious case, the physician should examine the vagina and uterus for marks of injury, wounds, perforations. He should notice if there are indications of irritants in the stomach and intestines, or inflammation in the bladder or kidneys resulting from the use of emmenagogues. He should note what drugs or instruments are in her possession and if there are any marks of violence upon her body, for abortion is sometimes attempted by the woman herself by this means.

Witthaus and Becker, in their work on medical jurisprudence, quote from Tidy's work on the same subject the following table suggesting a line of inquiry for the medical practitioner in cases of suspected criminal abortion:

I. *Examination of the Mother, if Living.*

1. Temperature.
2. As to the woman's predisposition to abort and the period at which abortion has commonly occurred.
3. General state of health. (Note existence of leucorrhœa, excessive menstruation, syphilis, asthma, malignant diseases, uterine diseases, etc.)
4. Whether the woman be well or ill formed. (Note pelvic malformations, effects of tight lacing, etc.)
5. Whether or not there be signs of recent delivery or of the expulsion of the uterine contents.
6. Whether any cause can be assigned to account for the abortion (*e.g.*, violent coughing, blood-letting, straining at stool, violent exercise, undue excitement, septic poisoning, violence, administration of medicines, etc.).
7. All injuries of the genital organs (consider whether the injuries might be self-inflicted.)

II. *Examination of the Body of the Mother, if Dead.*

Note—

(*a*) The necessity for care not to mistake the effects of menstruation for those produced by abortion.

(*b*) To avoid injuring the parts by the knife or otherwise during the autopsy.

(*c*) To consider the possibility of injuries being self-inflicted.

1. Note the existence of marks of violence on the abdomen or other parts.
2. The condition of the genital organs, noting all inflammations, rents, tears, perforations, etc. (if the uterus be injured it should be preserved).

Note also—

(*a*) The condition of the passage (relaxed or otherwise).

(*b*) The condition of the os uteri (virginal or gaping, etc.).

(*c*) Vaginal secretions, and if present their character.

(*d*) The general appearance of the breasts, presence of milk, etc.

3. Whether there be any signs of irritant poisoning in rectum, etc. (contents of stomach to be preserved, if necessary).
4. Whether the viscera generally indicate loss of blood during life.