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HABITUAL MISCARRIAGE: ITS CAUSES AND PREVENTION.

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A NORMALLY constituted woman, should she conceive, ought, in the nature of things, to carry the fruit of her womb to term, barring accident, constitutional vice, general or local disease. Such is the rule. The exceptions are not inconsiderable, and the successful treatment of habitual miscarriage is apt to tax severely the patience and resources of the physician. Owing to the impenetrable veil which shrouds the functions of reproduction, there must ever, for all any one can predict, be certain causes which will baffle our best endeavors and defy our keenest insight. That microscope, powerful enough to fathom the pathological histology of the ovule and spermatozoon, does not yet exist. Till man's ingenuity, therefore, shall have enabled him to construct so delicate an instrument, latent, or rather hidden causes of habitual miscarriage must remain hidden. Meantime, a closer study of the apparent causes may possibly help us towards saving many an embryo, and granting to many a woman her heart's desire—offspring. It is a

proper task, then, to present, in 'a connected way, whatever bears directly on the subject of habitual miscarriage, and to endeavor to formulate the means at our command for its prevention. The propriety of the task is all the more apparent when, on looking through the voluminous literature pertaining to obstetrics, I find only scant and, at best, disconnected reference to the subject.

At the outset, let me protest against a not uncommon practice of giving as an explanation the element "habit." This is simply begging the question. It may be laid down as a rule that some phenomenon, usually morbid, is at the base of every miscarriage. Usually, the death of the fetus is the immediate cause; but we must look behind this fetal death for the prime cause which forbade it life. To say that "habit" was the causative factor, is only applicable to those cases the outcome of some latent, hidden condition; but even here there will usually be found a starting-point for the habit. Granting that labor at term results from the fact that the uterine contractions, which insensibly occur during the whole course of pregnancy, at the ninth lunar month reach their acme, it is conceivable that a womb which has once miscarried at a certain month may repeat the process again and again, from the recurring nervous discharge at the same time. Recourse to such an explanation, though unscientific, will often have to suffice. The human mind, however, in its search after truth, longs for something more exact, more tangible; and, fortunately, in the vast majority of cases of habitual miscarriage, the microscope and the scalpel afford it.

What, then, may cause habitual miscarriage? Broadly, either the fetus is at fault, or the mother. In the former instance, seeing that the ovum, when once impregnated, is dependent entirely on its mother for sustenance, and hence for disease as well as health, it is obvious that, whatever imperfection it does not derive from the mother, must come from the father. If the fetus dies, then, and from this very fact is not carried to term, it is well to remember that one or other, perhaps both of the parents, may have been the prime factors in causing its death. In the second instance, the mother alone is primarily at fault, through some local cause which renders the uterus unfit soil for an ovum.

In general, the causes may be tabulated as follows :

1. Syphilis.
2. Maternal anemia.
3. Uterine disease, and disease of the uterine appendages.
4. Uterine displacements.
5. Chronic cellulitis and peritonitis.
6. Laceration of the cervix.
7. Intermittent fever.
8. Chorea.
9. Bright's disease.
10. Tumors.
11. Lead poisoning.
12. Reflex conditions.

Before entering into a detailed study of these causes, it will be of interest to give, in brief, the opinions of various authorities as to the etiology of habitual miscarriage. Leopold has probably studied the subject to a fuller extent than any one else. His monograph, as it appears in the *Archiv für Gynäkol.*, VIII., 1875, contains reference to most of the early literature, and it is to him I am indebted for many references going to form the following résumé:

D'Outrepoint (*Neue Zeitschrift f. Geburtskunde*, VI.) considered the causes as lying either: 1st, in the respiratory organs; 2d, in the uterus; 3d, in the ovum; 4th, in the umbilical cord; 5th, in the ovaries; 6th, in the placenta.

Simpson (*The Works of Sir J. Y. S.*, Vol. I., Obst., p. 102) ranked intrauterine peritonitis as the prime factor. This fetal disease may arise either from external violence, or from maternal syphilis. Evidence of the last cause he found frequently present in the fetus after death. The next factor he considered to be disease of the placenta, such as hepatization, abscess, fatty degeneration, and hypertrophy.

Fuhrhaus (*Inaug. Dissert.*, Marburg, 1831) tabulates the causes as proceeding: 1st, from the mother; 2d, from the father; 3d, from the ovum; 4th, from unknown conditions.

Porter (*Dublin Quart. Journ.*, 1857) considered syphilis the main cause; and Martin (*Mon. f. Geb.*, 19, 85, 1862), from a series of observations, came to the conclusion that the most common cause of habitual miscarriage was the death of the fetus from a disease to which he gave the name "hydrops sanguinolentus."

tus," characterized by dropsy of all the serous cavities, as well as accompanied by bullæ on the external surface. The disease was the outcome of syphilis in one or both parents, particularly in the father.

In 1865, Döbner (*Würzb. Med. Zeitschr.*, VI., 37) recognized two causes of habitual miscarriage: 1st, maternal anemia; 2d, syphilis. Scanzoni agreed with him ("Lehrbuch," II., S. 16) and laid main stress on syphilis.

Spiegelberg (*Monats. f. Geb.*, 34, S. 376) considered hereditary syphilis as the cause; in a later paper (*Archiv f. Gynækol.*, I., S. 11), however, he has reported cases not dependent on syphilis.

Leopold (*loc. cit.*, p. 236) divides the causes into four: 1st, syphilis; 2d, anemia; 3d, chronic uterine disease; 4th, inherited disposition, and highly nervous constitution of the mother.

Playfair ("Science and Practice of Midwifery") states that the most common cause is the death of the fetus, "which leads to secondary changes, and ultimately produces the uterine contractions which end in its expulsion." The causes of fetal death cannot always be ascertained, sometimes depending on maternal conditions, sometimes on ovular, and again on both. "Syphilis is well known to be one of the most frequent causes, and one that is likely to act in successive pregnancies." "It acts in some cases through the influence of the father in producing a diseased ovum, and it is the only cause which can with certainty be traced to the state of the father's health." Amongst other causes of habitual miscarriage, he mentions fibroid tumors, old peritoneal adhesions, retroflexion of the uterus, inflammation of the cervical and corporeal mucous membrane.

Cazeaux ("Theoretical and Practical Midwifery." Revised by Tarnier) accords to syphilis the principal rank, and calls attention to the fact that a vitiated spermatic fluid may be the cause of fetal death. He says (p. 565) that M. Guillemot attributed the numerous miscarriages of a lady who consulted him to this cause; for the husband, though of a suitable age, exhibited all the signs of premature decrepitude. At her death, she married again, was often pregnant, and always went to term. Atmospheric conditions, Cazeau also points out, are not without influence in the production of abortion. The women inhabiting the summit of the Vosges are very subject to

abortion, and they descend into the adjacent plains to avoid the accident (p. 562). M. Cazeau also lays stress on the fact that the age of the husband has an influence. "Ova fecundated by men who are either too old or too young rarely become, it is said, fully developed, and the same remark applies to those whose constitution is exhausted by excess or debauchery of any kind."

Lusk ("The Science and Art of Midwifery") places syphilis amongst the principal causes. As others, endometritis, displacements, especially retroflexion, perimetritic inflammations, carcinoma and fibroids, and a peculiar condition of nerve irritability. In the newly-married woman "one abortion sometimes follows another in rapid succession. Whilst the first abortion may have been due to some accidental cause, the sequence is often kept up by a morbid condition of the endometrium, generated by shortness of the intervals between the pregnancies, which does not allow the restoration of the membrane to a normal condition."

From this passing survey of much of the literature pertaining to habitual miscarriage, it will be seen that most authorities are in accord in regard to the important rôle which syphilis plays in its production. Entering then into a consideration of the causes as already tabulated, I will begin with the specific diathesis, seeing that it is the predominating factor.

SYPHILIS.—At the outset, without any intention of discussing at length the manner in which the fetus may become affected, it is necessary to refer briefly to the subject in order to lay a proper foundation for the rational treatment. The fetus, obviously, receives the poison either from the father or the mother. Though semen from a specific source has been inoculated in healthy individuals without any ill effects, it must be admitted that the semen may be the carrier of the specific product, seeing that not infrequently, whilst the mother remains healthy, and the father shows no active specific lesion, the mother aborts frequently or carries to term fetuses presenting evidences of syphilis. Usually, though the father be subject to the disease, unless he infects the mother, the fetus will escape. Exceptionally, however, as clearly proven by Fournier ("Syphilis et Marriage"), the paternal influence is far from *nil*; and such cases are all the more noteworthy from

their rarity. If Fournier were alone in holding this view, the facts he presents would set it beyond controversy. But Ricord, Diday, Trousseau, Depaul, Carl Ruge, etc., have also reported cases of the kind; therefore we must accept the proposition laid down by Fournier that, "however rare and exceptional, relatively, be the fact of transmission of syphilis from the father to the fetus, it can nevertheless occur in a certain number of cases." This author has collected thirty-six cases of this nature, where the children were born dead or dying. The importance of the due recognition of the possibility of fetal infection after this fashion will be seen when I come to speak of treatment.

Aside from the fact that the father may thus infect his child, it is noteworthy that at the same time the mother may become infected, the transmission being through the fetus. In such a case she presents no primary lesion; therefore, unless the physician be on his guard, he may overlook the fact that the symptoms she will present are due to syphilis, and not be able to explain her repeated miscarriages. This method of infection—the *choc en retour*—is called by Fournier, "Syphilis par conception;" by Jonathan Hutchinson, "fetal blood contamination."

Now why is it that syphilis is such a powerful agent in causing miscarriage? How does the poison act? In the first place, it so alters the mucous membrane lining the uterus as to forbid the growth of a healthy ovum, whence decidual, chorionic, and placental diseases. In the second place, it infects the fetus, leading to changes in its organism incompatible with life, such as intrauterine peritonitis, as originally demonstrated by Simpson, or to what Martin has called "hydrops sanguinolentus." It is not strange, therefore, that the offsprings of syphilitic parents die prematurely, or if brought into the world, in all probability will exist but for a time. The ovum has not only to struggle against diseases implanted in itself, but also is likely to be poorly and insufficiently, if at all nourished. The pathology of ovular and decidual diseases has not yet been clearly worked out. Their dependence on syphilis is, at best, but hypothetical, for, though found in cases where the specific taint is undoubted, they are likewise, at times, apparently the results of other causes, as, for instance,

a morbid state of the endometrium existing prior to conception. Most authors make the following artificial classification of the diseases which may affect the fetus and its appendages as the result of specific infection:

- (a) Diffused chronic inflammation of the decidua.
- (b) Polypoid decidual inflammation.
- (c) Cystic degeneration of the chorion.
- (d) Fatty degeneration of the placenta.
- (e) Stenosis of umbilical vessels.

The distinctive points in their pathology are, that in the first form there occurs a hypertrophy of the decidua following on an increase in its cellular elements; in the second form there is also an hypertrophy, limited, more particularly, however, to the interstitial tissue, and on the ovular surface of the decidua are to be found polypoid growths. The new connective tissue compresses alike the uterine follicles and decidual blood-vessels, leading not infrequently to fatty degeneration. This form of decidual disease was first described by Virchow, and by him considered a result of syphilis. It is, at any rate, not an uncommon cause of abortion, seeing that the inflammatory process, from its very nature, must interfere with fetal nutrition and development.

Cystic disease of the chorion at times occurs repeatedly in the same woman, and leads to miscarriage. Whence the view that the disease is dependent on some diathesis, such as syphilis, is plausible. There is strong ground, however, for the belief that often the change in the chorion is secondary to the death of the fetus, the principal one being the occurrence of twin pregnancies in which, whilst one chorion degenerates, the other does not. Whatever the cause, and probably both will hold, the pathology of the affection consists in a dropsey of the chorionic villi, preceded by an increase in cellular and connective elements.

Fatty degeneration of the placenta has been particularly described by Barnes, who considers it an outcome of syphilis. The fatty change affects especially the cells of the villi and the blood-vessels. According as the degenerative process is of greater or less extent, in so far will fetal nutrition be imperilled and abortion result. Goodell (*AM. JOURN. OBSTET.*, vol. II., p. 535) suggests that this fatty degeneration may possibly

be simply the occurrence at an earlier stage of what is normal at term.

Stenosis of the umbilical vessels is a rare, at any rate, not often noted cause, of fetal death. In some cases the condition seems to depend on hereditary syphilis. In others the connection is not quite so clear. Winckel, as quoted by Leopold in his article (*loc. cit.*, p. 257), has reported six cases, and in one only could he trace the pathological condition to syphilis. Leopold reports a personal case where syphilis could be absolutely eliminated from both parents. The occurrence of the lesion, whether dependent on syphilis or not, ought to be borne in mind, as it may often be the cause of fetal death and subsequent miscarriage, thus explaining cases which otherwise would be classed as due to hidden causes, or result from "habit."

Passing now to the treatment of habitual miscarriage dependent on syphilis, the two main facts must be borne in mind that the cause may reside either in the mother or the ovum, the latter, of course, deriving the infection from its father. Treatment, then, must be directed to modifying the effects of the poison on the maternal side as well as the paternal. The old fear of using mercury during the course of pregnancy, lest it should interrupt it, has disappeared. It is the one drug indicated in sufficient dose to fall short of salivating the patient. Its dosage must be watched carefully, lest the patient become enfeebled. The best method of administration, if not the cleanest, is by inunction, as thus gastric disturbance, which is physiological in pregnancy, is not likely to supervene in excess. The cause of miscarriage once laid to syphilis, both parents should be treated, because there are cases where the infection proceeds from the father, sparing the mother unless she become secondarily affected through the fetus. The following case from Fournier (*loc. cit.* p. 49), will emphasize the necessity of paternal treatment:

"Fifteen years ago I met, by chance, an old college mate whom I had not seen for a long time. During the course of our conversation, my friend told me his troubles. 'I am,' he said, 'sorely afflicted; my wife has just miscarried for the fourth time, at about the second month; and what is worse, all her miscarriages have resulted from no discoverable cause. My wife is in excellent health; and yet, to my sorrow, I foresee she will never

bear me children.' Now I remembered that, whilst my friend lived in the Quartier Latin, he had had syphilis. So I placed him on the mixed treatment, and fifteen months later his wife presented him at term a child now twelve years old."

Finally, in any treatment of habitual miscarriage dependent on syphilis, the pathological changes which may occur in the decidua should be borne in mind. These changes have all about the same effect—the deprivation of fetal nourishment. Whilst then giving mercurial or the mixed treatment, it will be well to make use of a drug recommended, I believe, first by Simpson, at any rate, highly spoken of by Fordyce Barker—the chlorate of potash. The rationale of its action is that, through its decomposition, it increases the oxygen in the mother's blood, and hence affects favorably the fetal nutrition. In one case under observation for many months at the Polyclinic, the drug seemed to have some influence, for the patient who had previously miscarried uniformly at the fifth month, this time carried her fetus to the seventh. Dr. Mundé informs me that he has met with two cases of habitual miscarriage; one, nine times in the fifth month, the other, five times in the third month, in which the continuous administration of chlorate of potash and tr. chloride of iron during the whole pregnancy (with rest in bed for several weeks at the time of the miscarriages), resulted in a normal labor at term, and a healthy living child.

General treatment, further, is not all. The effect of the specific poison on the uterine mucous membrane is to be remembered. Conjointly, then, with general medication, something may be hoped for from local applications to the endometrium in the intervals between conceptions; for thus the hyperplasia, which often primarily exists in cases where the diathesis precedes conception, a hyperplasia rendered worse by each recurring miscarriage, may be limited in amount and less risk be run of its invading the decidua.

If now, by means of the above outlined treatment, we are enabled to assist the mother in carrying her child nearer to term than she has ever done before, what is the next step? The induction of premature labor as soon as the child is viable in case there appears evidence of heart failure. Abortion from syphilis, where the child derives the infection from its

mother, is apt to occur about the sixth month. If, then, the mother be assisted to carry the child to seven months, she should be directed to spend most of her time in the horizontal position, to avoid fatigue, and to abstain from sexual intercourse. The physician should listen frequently to the fetal heart, and at the first sign of weakness, he is justified in inducing labor. The question of the means to use for this purpose obviously does not come within the scope of this paper.

MATERNAL ANEMIA.—This cause, *a priori*, would appear to be a factor in the production of miscarriage. The fetal nutrition varies *pari passu* with that of the maternal. Any cause, therefore, which affects the latter unfavorably, must react on the former. The chlorotic woman is already poor in blood; let the hydremic condition which accompanies pregnancy be superadded, and it is manifest the fetus stands small chance of life. The placenta, if properly formed, receives from the mother improper material for fetal sustenance. The wonder is, indeed, that the mother should ever go to term, not that she should miscarry. A disposition to abort, also, is noted in corpulent women. Lusk ("Science and Art of Midwifery," p. 292), explains this on the supposition that the blood is insufficient in quantity and quality to supply the wants of the fetus. On Oazeaux's authority, as already given, it is a fair inference that paternal anemia may be at the base of miscarriage. At any rate, the rational treatment of habitual miscarriage seemingly dependent on anemia, should be directed to the cure of both parents, in case both present symptoms. As to what the treatment is, it needs no repetition here. One point only must be insisted on, that any treatment must be long continued.

UTERINE DISEASE AND DISEASE OF THE UTERINE APPENDAGES.—Endometritis as an essential factor in the production of abortion has already been laid stress on when speaking of syphilis. Whatever the cause of the endometric inflammation, the result is the same—a morbid soil for the ovum. Each succeeding miscarriage simply makes matters worse; for an abortion to the lay mind is a simple affair. The average woman goes about her daily tasks as though an abnormal process were not occurring. The result is subinvolution and, later, hyperplasia. Only when the physician steps in can there be hope of

limitation of the process. He will tell her that an abortion requires rest in bed, even as labor at full term does; he, if of progressive mind and free from deep-rooted prejudice in favor of old-time methods, will see that the uterus is perfectly emptied of all trace of ovum and secundines; and, finally, he will not hesitate to make those applications to the endometrium from whose use the bearing of children to term may become possible. As for disease of the uterine appendages, if it be bi-lateral, sterility will result; if one-sided, however, such is the intimate connection between the mucons lining of the uterus and tube that, granting the advent of a healthy ovum to the uterus, it may find the endometrium in a state of inflammation derived through contiguity of surface. The result here, then, will be the same as regards the continuation of pregnancy as though the uterine endometrium were primarily affected.

The treatment applicable to endometritis is as laid down in most works on gynecology. Energetic, prolonged applications of the compound tincture of iodine, carbolic acid, nitric acid, scarifications, according to the preference of the physician and according to special indications. The hot vaginal douche and general medication naturally are indicated.

UTERINE DISPLACEMENTS.—Anterior displacements are so rarely factors in producing miscarriage that they need no reference here. Of the retro-displacements, version, if of the third degree, will almost always be accompanied by sterility, because, the cervix lying behind the symphysis, the male organ cannot impinge on it, but seeks the posterior cul-de-sac and there deposits the semen; if of a lesser degree, the woman may conceive, and then the impregnated uterus will either rise or become a retroflexion. In this condition matters are different, and miscarriage here may be due to one of two causes. If the flexion be of recent date, on conception ensuing, the course of gestation may go on smoothly till the third month, at which time the uterus can no longer expand in the true pelvis, and must rise above the brim for further development. This, from its retroflexed state, it may not be able to do. Its futile endeavors become a source of irritation, and it contracts on the ovum and expels it. In the other case—where the flexion is of long standing—a further factor is introduced. A retroflexed uterus soon becomes a congested uterus; this congestion before long

passes into a hyperplasia; conception ensuing, the ovum finds a congested, hyperplastic endometrium to develop in, and should it succeed in accomplishing this, it may be only to be expelled when the uterus is obliged to rise above the brim.

The treatment indicated is simple enough if properly and understandingly applied. A uterus displaced anteriorly, when fecundated, can best be held in place by an abdominal supporter. Simple retroversion calls for an Albert Smith pessary. It is the retroflexion that is apt to give trouble. If, by putting the patient in the knee-chest position, the uterus is with ease replaceable, the fundus will remain above the brim where gestation has advanced to the fourth month. If not, a pessary is to be introduced. Ordinarily this will answer, but exceptionally the fundus will simply flex over the posterior bar of the pessary. In such a case, a Cutter may yield better success. If this fails, the patient must keep her bed, lying alternately on her side and abdomen till the fourth month has passed. Rarely will such a radical measure be required for more than a fortnight. Where hyperplasia exists, proper endometric applications should be used conjointly with the pessary in the non-gravid intervals.

CHRONIC CELLULITIS AND PERITONITIS.—It is clearly apparent how these factors may lead to miscarriage. The uterus being bound down by adhesions of greater or less extent, when in the course of gestation it must rise, the adhesions will have to give or else the ovum will be expelled. Not uncommonly, also, the uterus will be retroflexed, so that a further factor in the etiology of miscarriage is introduced. Often sterility is the result of these conditions, since the ovaries, and the tubes as well, may be enveloped by the plastic exudation, and hence are unable to properly functionate. Should they functionate, however, what more likely than that the ovum, the outcome of a source in an inflamed condition, should itself partake of the same condition, and hence lack elements necessary to its vitality? Under this heading, as having the same effect, should be simply mentioned the adhesions to the abdominal walls following an ovariectomy.

The treatment of these conditions is, in its results, rarely satisfactory. Whilst we possess means powerful in causing absorption of plastic material, we are, unfortunately, unable to reach

the whole of it. The best which our art yet offers is frequent applications of tincture of iodine to the vaginal vault, followed by tampons saturated in glycerin, by means of which, in course of time, we may hope to stretch and break down the adhesions. At times cautious, tentative efforts at uterine replacement should be made. The hot vaginal and rectal douche will assist the absorption of the plastic exudation.

LACERATION OF THE CERVIX.—The data as regards the influence of this factor in the production of abortion is not very exact. The usual result of the lesion is, as might be expected, sterility. It is perhaps impossible to do more than infer that laceration of the cervix may be a cause; for it is to be borne in mind that the laceration itself brings in its train many evils, any one of which is sufficient to cause miscarriage—such as inflammation of the cervical and corporeal endometrium, subinvolution, cellulitis. Emmet, from his elaborate statistical tables ("Principles and Practice of Gynecology"), was enabled simply to draw the conclusion that by far the larger proportion of women remain sterile after the receipt of the lesion. Ely Van de Warker, in a paper on the Repair of Lacerations of the Cervix Uteri (AM. JOURN. OBSTET., July, 1833), makes no attempt to draw any deduction as to the influence of the lesion in causing miscarriage. He shows, however, conclusively its influence on sterility. He says (p. 688), "if we were to include abortions among the pregnancies occurring during the existence of laceration, we should have a better showing in favor of the operation *as a cure for sterility and abortion.*" (Italics mine.) Obviously, therefore, he tacitly admits that laceration may be a cause of abortion. At a recent meeting of the Obstetrical Society of Philadelphia (Feb. 1st, 1883), Dr. B. F. Baer gave an extended analysis of twenty-seven cases of trachelorrhaphy, with the object in view of determining the effect of the lesion on sterility and labor. "In eight cases pregnancy had occurred within five years, but had resulted in abortion in five." In twelve out of twenty-one cases "from one to five abortions had occurred in each subsequently to the occurrence of the laceration;" and further he says, "in more recent cases, for the cure of subinvolution, abortion and sterility, the operation is an immense stride" over the old method of cauterizing, etc. The following case, somewhat abridged, taken from Baer's valuable

paper, offers strong evidence in favor of the point I wish to make—that laceration of the cervix deserves place as a factor in the etiology of habitual miscarriage.

M., æt. 30, was first seen in January, 1881. Two years before had her first child. Labor was rapid, convalescence good. Ten months after, again pregnant. Aborted between second and third month. In three months, again pregnant; aborted at about the same time. Similarly in six months, the same sequence. The patient and husband were free from syphilis. The uterus was in normal position, not enlarged; the cervix was lacerated on the left down to the vagina. The fibres of the internal os were apparently involved. There was no eversion, no metro or menorrhagia. Nevertheless, the connection of cause and effect seemed so evident, that an operation was advised and performed. Three months after the operation she again aborted. A little more than one year after, she went to term and was delivered of a healthy male child. There was no re-laceration.

From a thorough consideration of the facts at disposal, the inference is fair, that if impregnation occur in a uterus whose cervix is lacerated, the chances are greater for miscarriage than against.

The treatment lies in the repair of the rent, not neglecting, of course, associated conditions.

INTERMITTENT FEVER.—The facts in regard to the influence of this cause on the continuation of pregnancy are very few; still, what I have been able to collect lead me to the opinion that a woman, the victim of malarial fever, very probably will miscarry. Lusk (loc. cit., p. 254) says, "malarial fever does not produce abortion except in rare instances." Playfair (loc. cit., p. 224) says that in malarial districts the occurrence of enlarged spleens in mere infants is often observed, and hence argues that the occurrence of the disease during intrauterine life must be very common. Cazeaux (loc. cit., p. 445) says "there can be no doubt that, as M. Ebrard has endeavored to prove, the grave disorders and perturbations produced throughout the economy by the febrile paroxysms, the obstinate vomitings which attended many of them, and the cough, diarrhea, and colic, may disturb greatly the functions of the womb; also that the fluxion and congestion so often produced by this fever may cause the premature expulsion of the product of conception." Leopold (loc. cit., p. 252) quotes a case of Krieger's:

The patient, free from syphilis, as also her husband, had been for a long time under treatment for enlarged spleen. She gave birth to a living child in 1855, which died in a few weeks of a cellulitis of the neck; again, in the following year, a living child, which died in two weeks of icterus. In the following pregnancy (1858) the patient had extensive dropsy of the lower extremities, and was confined prematurely at the eighth month of an asphyxiated fetus. By the next pregnancy (1860), a fetus three weeks too early, dead and dropsical, with enormous hypertrophy of the kidneys. The placenta in both these cases was degenerated to a mole. As a cause of these premature births, Krieger could find nothing except an intermittent fever with its characteristic splenic tumor.

This case is not very valuable proof, seeing that co-incidentally with the malarial cachexia, the patient was in a very reduced condition. Anemia, hence, may just as likely have been at the basis of her miscarriages. All that can be said, therefore, is that a woman, suffering from malarial fever, may abort, either as the result of the fever, or else from the accompanying anemia. That the fetus may be infected is undoubted. The increased temperature to which it is subjected, may, obviously, be the cause of its death.

The treatment must be the same as though the patient were not pregnant. There does not appear to be the slightest reason to suppose that quinine will induce miscarriage. Whatever oxytocic action the drug has, must be very slight. I have several times had occasion to give it in from ten to fifteen grain doses almost daily for months, and have never yet seen any but good effects.

CHOREA.—The relation existing between chorea and habitual miscarriage is somewhat more definite. Schroeder ("Manual of Midwifery," p. 115) says: "Chorea is relatively a frequent complication of pregnancy. It occurs very easily in those pregnant women who have suffered from chorea in infancy, and it may then recur in successive pregnancies." Playfair (*loc. cit.*, p. 198): "Chorea is not infrequently observed (during pregnancy), and forms a serious complication. In a large proportion of cases, the patient has already suffered from the disease before marriage. On the occurrence of pregnancy, the disposition to the disease again becomes evoked, and choreic movements are re-established. . . . It has also an unquestionable tendency to bring on abortion or premature

labor, and in most cases the life of the child is sacrificed." Lusk (loc. cit., p. 262): "Abortion and premature delivery due to the repeated succussion of the uterus, are of very frequent occurrence. Chorea exerts a prejudicial influence upon the course of pregnancy, having interrupted it in about one-half the recorded cases. Barnes (Trans. Obstet. Soc., London, X.) collected fifty-six cases, and in seventeen the mother died. These extracts might be multiplied, but they are sufficient to prove the pernicious influence which chorea may have on pregnancy. Doubtless a partial explanation of its action is succussion of the uterus; it is not unlikely, however, that the associated anemia enters as a factor.

The treatment indicated necessarily will not vary from that in use where pregnancy does not exist. Iron, to counteract the anemia; arsenic, from its supposed specific action; bromide, chloroform, ether, to control spasm; and finally, if the mother's life be endangered, the induction of labor.

BRIGHT'S DISEASE.—As might be expected, disease of the kidneys is a marked factor in the production of miscarriage. I am not referring to those cases where albuminuria occurs during pregnancy, leading in the later months to premature labor, either from eclampsia, or because such is forced on the accoucheur. It is particularly where the gravid state supervenes on an already existing albuminuria of organic origin that the prognosis as regards the continuation of pregnancy becomes grave. In such a case miscarriage is often the rule. And no wonder, when the altered state of the mother's blood is remembered. The fetal nutrition must suffer, and the death of the fetus soon leads to its expulsion. Tanner ("Signs and Diseases of Pregnancy," p. 428) had as patients seven women suffering from Bright's, and of these four miscarried, one three successive times.

The best part of the treatment must be the prevention of conception. Patients suffering from chronic Bright's, particularly the parenchymatous form, had best, where possible, be dissuaded from marriage; in case of marriage they ought to use means for the prevention of conception, since they are not fitted for the function. Whilst they might go to term, it is questionable whether their own health would not deteriorate. The extra burden imposed by pregnancy cannot but

have an unfavorable effect on the mother's health. Should she escape miscarriage, the child, though born alive, if it do not inherit its mother's disease, certainly stands small chance of good health. In short, morbus Brightii patients are of the class that had best not marry. With the increased diffusion of preventive medicine, the day may come when this fact will obtain clearer recognition than it does to-day.

TUMORS.—These may act in two ways: either proving sources of irritation to the uterus, or else, by preventing the proper development of the uterus. It is not every tumor which interferes with the course of pregnancy. Many are causes of sterility; many only appear as hindrances to delivery; many in no wise affect gestation. Of fibroid tumors, it is the submucous and interstitial which are most apt to cause abortion, as their presence interferes with the necessary growth of the uterus; those also which are pediculated from the cervix are sources of irritation and may thus, particularly in the early months, interrupt gestation. Epithelioma, if far advanced, will cause sterility; if in an early stage, it may interrupt pregnancy, either by the irritation it causes, or else, by binding the uterus down through ulceration, will prevent its ascent.

The treatment, during pregnancy, must be limited to the removal of small fibroids pediculated from the cervix, unless some symptoms from the side of the mother supervene fraught with danger to her. In the intervals between conceptions, that surgical treatment required by each tumor is indicated. It will be good advice to caution patients suffering from the submucous or interstitial varieties of fibroids, as well as carcinoma, against conception.

LEAD-POISONING.—This is not an uncommon cause of miscarriage, likely to hold as long as the woman is under the noxious influence of the metal. The rationale of its action must be looked for in the anemia, often of pernicious type, which accompanies long exposure. The toxic effects may also act directly on the fetus. In Oazeaux's text-book (p. 458), M. Tarnier makes reference to some interesting cases which may well be reproduced here. "Dr. Paul (*Arch. générales de Méd.*, 1860) made a study of the effects of this action (abortion from lead), during gestation. In 1859, he observed the case of a woman who had been three times safely delivered before being ex-

posed to the influence of lead ; and who, afterwards, out of ten pregnancies had eight miscarriages, one child still-born, and one delivered at term, but which died five months afterwards." This woman told Paul that many of her companions in the workshop miscarried or could not raise their children. He then undertook a series of observations with the object of determining the extent of the influence of lead. In eighty-one women, the poison showed itself, either in the death of the fetus or in its premature expulsion at from three to six months. Four of these women afforded a series of fifteen pregnancies, in which there were ten abortious, two premature labors, one still-born child, one which died in twenty-four hours, and one which survived. Another series of cases showed that the fetus might die without the mother presenting any signs of toxic influence. Altogether "out of one hundred and twenty-three pregnancies, there were sixty-four abortions, four premature labors, five still-born children, twenty which died within the first year," and, of the remainder, only fourteen reached ages beyond three years. These figures are significant and warn us always to inquire into the occupation of our patient in an obscure case.

The treatment lies in the removal of the cause. The woman, if she desires to bear children, must give up her occupation, and then, perhaps, after a long course of iodide of potass and tonics, her wish may be fulfilled.

REFLEX CONDITIONS.—Obviously, transient causes of miscarriage are entitled to no place in my paper. Because they act once, is no reason why they should act again. Blows, sudden shocks, the essential fevers, are all strong factors, and should they occur repeatedly, it would simply be a coincidence. As a final cause, however, those reflex conditions must be considered which have their outcome either from the nervous system in general or from the uterus and its appendages in particular. There are some women so delicately nurtured, so highly impressionable, as to react to the slightest nerve stimulus. Like hot-house plants, they must be watched and tended, lest the slightest influence, outside of their accustomed habitat, affect them unfavorably. Gestation with them is often toxic. The uterus repels the impregnated ovum, as it would a foreign body. It may be an excess in the nausea peculiar to the early months of pregnancy ; it may be an uncontrollable temper—some

such cause may in certain women bring about miscarriage. An ill-assorted marriage, if it do not lead to sterility, will often declare itself in repeated miscarriages; also the union of the old with the very young, and *vice versa*; and again close interbreeding will have the same effect. Cases where a highly wrought nervous system is at fault evidently have little rational treatment. An inherited or acquired organization is to blame. All that can be accomplished is through toning up or depressing the nervous system, according to indication, directing towards other parts the excess of blood or nervous force limited to one part, through massage, ordering change of air and scene. As for miscarriage dependent on ill-assorted marriage and the like our hope lies in the not distant future, when prevention will grow in favor, and much of the medical art will be merged in the preventive.

TWO CASES OF PUERPERAL ECLAMPSIA TREATED WITH
PILOCARPINE.

BY

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IN a paper on Puerperal Eclampsia in the *Lancet* of 1880, I endeavored to show that, while the pregnant and parturient states in no way prevented the occurrence of eclampsia from other causes, in the great majority of cases the convulsions were merely symptomatic of kidney disease, and therefore that our treatment should be chiefly directed to the relief of those organs, modified, of course, to suit the special conditions of the case, as chloroform is generally indicated to prevent the action of the voluntary muscles, and possibly for other reasons; and that it is frequently useful to continue narcotics by the use of chloral, but that our principal aim should be to restore the functions of the kidneys, and for this purpose wet cupping and poultices should be applied over the loins, and diuretics exhibited, such as digitalis and the spirit of nitrous ether, and that in most cases these must be supplemented by purgation