Chorus will dependant with a vesicular state.

Mammals in which with branch to become vesicular.

Transverse microscopic section through showing gelatinous wall with cysts partly filled with mucus jelly.

Small cells like leucoctoe interspersed.
Microscopic appearance from specimen of abortion show signs like cloud swelling.

Approximately normal specimen.

Cells of amnion, cloudy swelling.

Intermediate.

Abortion (3½ mo) ascribed to incompatance.

Normal endotelium lining amniotic cavity.

26th November.

Small cells like leukocytes interspersed.
Microscopic appearance from specimen of abortion showing squamous-like cloudy swelling
approximately normal specimen

Cells of amnion, cloudy swelling

Intermediate

Abortion (3½ mo) accumbent to in temporarance

Chorion with cells degenerating, granular, shreds of amnion from intermediate inner card layer

Decidua from same case - many flattened cells granular & degenerating - small cells, like leucocytes, interposed.
Microscopic appearance from specimen of abortion showing signs like cloudy swelling. Approximately normal specimen.

Cells of amniotic cloudy swelling.

Intermediate mucoid layer.

Covering of cord (connected with amniotic).  


Subepithelial layer (connective tissue).

The examination of its anatomy and physiology will therefore be admirable in the first place to glance at these fundamental considerations. It will be remembered how the mammalian ovum after its discharge from the Graafian follicle passes along the Fallopian tube, undergoes...
The Pathology and Treatment of Abortion

There is perhaps no subject connected with his profession which has lesses more interest for the general practitioner in medicine than that of abortion. Whether we consider it causes with a view to their prevention, its pathology, its mechanism, or its treatment, we shall find much to instruct us as to the influence of social usage on human life, as to the true meaning of the natural processes of development and its converse, degeneration, and much also to call forth in practical application the personal qualities of skill, judgment, and resource. The subject is one which can hardly be studied with reference to its pathology and treatment without some prior examination of its anatomy and physiology, and it will therefore be advisable in the first place to glance at these fundamental considerations. It will be remembered how the mammalian ovum after its discharge from the Graafian follicle passes along the Fallopian tube, undergo...
ing the whole the earlier stages of segmen-
tation. Shortly enters the alveoli. Here a
continuation of the same process divides
its primary substance into the blastoderm
hypoblast-layers with the mesoblast-
intervening, the whole being surrounded
by a capsule composed of the zona radi-
ata with the remains of the zona pelluci-
da. Then follows the differentiation of the
mesoblast, its division into somatopleura
and splanchnopleura, the former rising up-
wards over the body of the embryo which
has already become defined and is bud-
ding out the allantois from the mesoblast
at its hinder end, the latter passing
downwards along the splanchnic stalk
and over the yolk sac which from
this time undergoes rapidly progressive
atrophy and absorption by the embryo.
Matters of special importance with re-
ference to the future development of
the ovum: the process of abortion are the
formation of the amnion and chorion,
the growth of the placenta, and I would
add the composition and significance
Of this mesoblastic coat which cloths the amnion, separates it afterwards from the opposed inner surface of the chorion, and ascends upwards along the allantoic cord to the central mass of mesoblast in the body of the embryo.

The amnion or true amnion, formed by the confluence upon the embryo of the innermost sheet of the somatopleure, consists therefore of a layer of mesoblast lined with epithelial epithelium continuous with the umbilicoparietal dermis.

The chorion is formed, it will be remembered, of the outer layer of epiblast belonging to the somatopleural and splanchnopleural folds applied to the zona radiata, is lined by the corresponding mesoblastic reflexion, and is further strengthened at a later period by the mesoblast of the allantois. The branching chorionic villi consequently owe their epithelial covering to the zona radiata of the epiblast, their vascular core of connective tissue to the allantois and splanchnic mesoblast. The disproportionate development of a number of these
will, to form the placenta, the relation of that body to the foetus and to the remains of the umbilical vessels which adhere for a time at least to its surface, are generally understood. We have still to deal with the expansion of the amnion which at an early period in the history of the embryo has proceeded so far as to provide an investment of the whole inner surface of the ovum, the amniotic layer being separated from the inner surface of the chorion by a layer of gelatinous tissue of mesoblastic structure & furnished by the allantois partly also in all probability by the meso-blast which covers the outer surface of the amnion. To this layer I would direct especial attention and I may for convenience of description term it - the intermediate uncord layer.

We shall have occasion afterwards to return to this structure and to note that it undergoes important changes in many if not in all cases of abortion.

Changes in the uterine mucous membrane.

We need not occupy much space in describing
these. The process of overgrowth by which the mucous layer comes to form the decidua vera, its application round the ovum as the decidua reflexa, its great development opposite part of the allantois as the decidua serotina to form the placenta are familiar facts in the physiology of the pregnant state. It may be noted in passing that the fusion of the decidua reflexa and the decidua vera consequent upon expansion of the growing ovum is not completed till the third month of pregnancy. The manner of attachment of the chorionic villi is a matter of much greater importance. The old view that these were inserted within the glands of the uterine mucosa has now been discarded by the great majority of observers in favour of that explained by Turner, namely, that the branching villi are contained in crypt-like depressions consisting of the venous sinuses of the mother into which they pass, pushing before them a layer of flat maternal epithelium. Each villus contains a capillary loop embedded in connective tissue derived as
we have seen from the allantoic meso-
blast and coated with epithelium sup-
plied by the tubal zonal membrane
blended with epithelium, though this ap-
pears to be replaced by or fused with
that of the maternal sinususes in the later
Stage of pregnancy. The villi which at first
covered the whole ovum and are inserted
at all points of the inner surface of the
placenta rejoin become practically obli-
terated by atrophic changes over the
greater part of this area and cultivated
by special development to relatively
gigantic growth in the zonula to form
the placenta. Their attachment even here
is by no means firm, at all events till
the third month especially if through any
cause of malnutrition their growth be
more languid than usual. It follows
therefore that should abortion occur
expulsion of the ovum with only part of
the decidua structures or without
these altogether is rendered probable
this is what does actually take
place. In accounting for this fact which
is one of no small moment in connection with the question of treatment, we must remember also that atrophic or degenerative changes in the non-placental decidua are not limited to those connected with the disappearance of the early villi, for with the continued expansion of the foetal membranes the decidua vera reflexa also become blended with atrophied and are expelled at birth at all events as definite structures. It is to such atrophic or degenerative changes that we must in all likelihood ascribe the apparently easy natural separation of the foetal membranes and placenta at full term, there is no change so marked as this in the membrane which enclose the foetus in the majority of cases when that is prematurely expelled. The presence or absence of a sufficient degree of this separation degeneration appears therefore at the earlier as well as at the later period of pregnancy to have an important influence in deciding how far the evacuation of the uterus will be complete or par-
trial, and its bearing upon the measure advisable in treatment—other probable effects is also obviously very important. In particular, we may note the distinction which the degenerative process establishes between those cases in which abortion comes about as one might say, by natural causes, that is, without the exciting action of any mechanical shock, and those in which it is distinctly traceable to some form of violence and particularly, where a woman generally healthy & likely to in ordinary circumstances to complete her term of pregnancy is subjected to artificial measures designed either indirectly or when drugs are used or directly by means of instruments to precipitate abortion. In the former class, the ovum is more or less ready to be cast off & spontaneous evacuation of the uterus will probably occur in the latter, adhesion is formed and it is common to find that some part of the uterine contents is retained and become the seat of a septic process.
The Pathology of Abortion

Having dealt with the details of structure and relation connected with the normal growth of the ovum we shall be able to follow the more rapid the abnormalities of development due to disease which result in its expulsion. Among these details it will be well to bear in mind as particularly necessary for the explanation of the subject the relations of the chorion, the amnion, what has been above described as the intermediate mucoid layer, which is continuous with the mesoblastic connective tissue and through this with the rudimentary lymphatic system of the embryo. It is necessary in these tissues or in one or other of them that the morbid changes observable in abortion and which appear to bear a causal and relation to it usually show themselves. These are for the most part changes of an atrophic or degenerative character except as has already been stated, when accident or mechanical injury is directly accountable for the miscarriage. During several years I devoted apart of the
leisure obtained from intervals in the work of general practice to the examination of specimens of abortion. Material of this kind can fortunately nowhere be found in great abundance; consequently the observations which I have been able to make do not rest on so wide a statistical basis as that afforded by cases examined as to justify in themselves any conclusive statement as to the pathology of abortion. Nevertheless, it may be claimed for them that, as far as they go, a reasonable amount of care has been taken to read aright the suggestions which they afford. Knowing that even a diminution of light such as they can give to an without its value in a study so obscure, I now offer them for comparison with the views of others who like myself are interested in this subject.

The total number of cases examined was 28. Of these, three must be deducted as incomplete, one of six months, one of four and a half months development of which the details examination were very meagre and another which was represented merely by a fragment retained in utero but was noted on
account of its bearing on the question of treat-
ment. A factor was present in fourteen of the
remaining twenty-five cases. These were obscure-
signs of one in one other, in another case no note
on this subject has been made, and eight were
moles. The degenerative changes noticed were
as might be expected those of fatty or mucoid
metamorphoses or a combination of these two
conditions. The accompanying table contains a state-
ment of their relative frequency.

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatty metamorphosis</td>
<td>4</td>
</tr>
<tr>
<td>Mucoid</td>
<td>3</td>
</tr>
<tr>
<td>Fatty with mucoid change</td>
<td>3</td>
</tr>
<tr>
<td>Atrophy</td>
<td>2</td>
</tr>
</tbody>
</table>

Of carcinoma moles there were 2 (though both of these showed also fatty change)

Of normal or almost normal specimens there was (a case of 1

accidentally induced abortion) 25

The cases tabulated above being un-
selected, these cases if they teach anything,
show the existence of a practically constant
relation between abortion and atrophic
or degenerative changes in the ovum & its
attachment. It will be best to study in detail the character of these pathological changes but in order to do this, a clear understanding of the normal microscopic structure of at all events the chief structures in the ovum and of the decidua is necessary. Taking first the decidua, one finds that this presents on the surface and the ovum a layer of epithelial scale, oval, several times the size of a red corpuscle, having one round nucleus and embedded in a glistening but granular intercellular substance, deeper at the uterine surface are spindle-cells of connective tissue along with some muscular spindle cells. At both surfaces there are also seen a number of smaller round cells resembling leukocytes. The outer surface of the chorion is coated with flat epithelial scales 2-4 times the size of a red corpuscle and with one round nucleus, and the inner aspect of the same surface shows in addition to these an arrangement of hazy fibres containing ovoid spindle cells about as large as epithelial cells. I have noted in connection
with one specimen of abortion that the character of these spindle cells are such that they seem to represent an intermediate stage between the cells of connective tissue and those of epithelium as if the latter were developed by gradual transitional changes from the former. An essentially similar epithelial covering encloses the cells underneath this also is a delicate fibro-cellular connective tissue.

The intermediate mucoid layer consists of a gelatinous substance with spindle cells and a few round or oval epithelial cells.

Most internally, there is the true amnion which, presenting on its outer surface, is that which the chorion, traces of the hazy muco-fibrillar structure of the mucoid layer just mentioned in a stratum of round or oval cells of considerable size in a delicate stroma lined on the foot side by a most beautiful and exactly fitting pavement of epithelial scales from 2-4 times the size of a red corpuscle having each, one nucleus. At some parts a jelly-
Like matrix intervenes. This layer is said to be continuous with the outside of the embryo and its cord, while the mucoid layer at once forms the substance of the cord and by it becomes continuous with the fetal connective tissues that is with the what really constitute the capillary sources of the lymphatic system. This fact is not only a bearing upon embryonic nutrition.

The amniotic fluid as one usually sees it in cases of abortion is lightly turbid, so a grey or yellowish colour. That contained in one of my specimens in which a typical change was the most marked feature was found to be neutral in reaction and contained albumen in moderate amount, chlorides 1/12, a small quantity of phosphate and epithelial debris. There was no mucin. That from two other specimens is noted as having been examined microscopically but nothing was found save granular debris. On examining the fetus there are two points which merit particular attention. These are:—1. The rela-
truly advanced development of the glandular organs which, especially at this early stage, are concerned in the formation of the blood, and...

2. The preponderance of connective tissue in the embryonic viscera. I shall illustrate these points by reference to the structure of a foetus taken from an abortion at 31/2 months, which, having been passed by an apparently healthy woman, and being indeed accidentally “promised” may be taken as fairly representative of normal development at that period. The history was as follows, -

The patient had had intermittent hemorrhage for about two days, and this continued in spite of medical treatment. Judging from her statements, and by vaginal examination, I thought the womb had already passed, but that some part of the placental structure remained in utero. I inserted a sponge tenet with the result that the foetus with its capsule was expelled within 24 hours.

The comparative weights of the viscera in this case were: - Brain about 160 grains (including the weight of a small piece of the muscle wrapped round it). Liver 45 grains. Lungs
Right 21 1/2 yr., left 18 yr., Kidneys each 4 1/2 yr., Spleen each 2 yr., Spleen 1 yr., Pancreas 1 1/2 yr., Thyroid gland 1 yr., Heart 5 yr. The liver as is usually found in such cases till an even later period of foetal life appeared disproportionally large, extending as low as the right groin and the umbilicus. The suprarenals, it may be noted, were half as large or the kidneys and twice the size of the spleen. The active or epithelial tissue of the liver, Kidney, suprarenal capsule, and lungs were considerably advanced in development and the abundance of nutritive tissue in the liver generally attracted attention. In the lobule of the liver it could be seen passing between the individual secreting cells and this was also noticed in the suprarenal bodies. The observations on the relative development of the glands are borne out by examinations of several other embryos and appear to be fairly constant up till even the fifth month of intrauterine life. I would draw attention to their important bearing upon the nutrition of the foetus and this is the
more evident when we remember that the intermediate layer of the fetal tissues, the mucous layer above referred to, which lines the inner surface of the chorion and is doubtless brought in communication through the walls with the products derived through the maternal blood, is continued as Wharton's jelly along the umbilical cord into the body of the foetus and is by means of its rudimentary or connective tissue united with the lymphatic system generally and with the glandular structures in which it exists in a more condensed form. No lymphatic vessels have yet been demonstrated in the umbilical cord and this to my mind increases the significance of the continuity of structure by which the mucous tissue of the foetal membrae is connected with that of the foetus itself. Nourishment is doubtless conveyed to the latter by the umbilical veins, but it is I think reasonable to suppose that in the absence of a regular lymph vascular communication, the nutritive function of such a system is carried on by the lymph spaces of the tract of connective tissue to
which I have referred. If we regard this as being the case we can understand how degenerative changes arising in the foetal membrane, such for example as that excessive formation of mucoid tissue which gives rise to the hydatid mole, must interfere with the growth of the whole ovum and must tend to cause its untimely expulsion.

The foregoing remark have paved the way for entering upon the study of our proper subject: —

The Pathology & Treatment of Abortion.

With regard then to its pathology, the first thing to be noticed is that, as already said, the morbid changes most usually found in cases of this kind, are those of aborting & degeneration. These changes occur so regularly in aborted ova that I cannot but regard them as having much to do with the causation of miscarriage. The point at which they begin and the influence of the factor in the matter is often very difficult if not impossible to determine. In molar, where the embryo has either never been formed or has
shed & become disintegrated the enveloping membranes commonly remain attached to the uterus for a longer or shorter time, it may be for several months, undergoing the while atrophic, fatty, or mucoid changes, till these result in their elimination as foreign matter. Here the early death of the foetus would account for the molar appearances & their effects but that frequently the absence of any sign of an embryo makes us question whether it has ever been truly formed. Sometimes a condition is met with which appears to mark a transition stage between mole & those aborted ova which contain an embryo. As an example I may mention a specimen of my own appearance early if at the third month of pregnancy & measuring when unwrapped 3½ by 2 inches. The foetus was only ½ an inch in length & though entirely looked soft & sodden. There was marked excess of mucoid tissue in the membranes. Had the ovum been retained much longer I doubt if any foetus would have been found in it. Probably its death at the fifth or sixth week of intra-uterine life would account for the imperfect development of the membranes.
and this in turn for the miscarriage. We may now study in detail the various kinds of degeneration which coexist with abortion, and their effect upon the tissues of the womb, taking first, in order that which is at once the most common and the most characteristic.

Fatty degeneration. In my own experience as mentioned above this is associated with the great majority of cases of abortion. It is a true metamorphosis affecting the cell protoplasm and nuclei of the epithelium of the connective tissue, spindle cells, as well as the intercellular substance of the structures which make up the womb, the decidua. So far as my own observations go it is more prone to occur in the chorion than in the other tissue though sometimes very marked in the latter and I am bound to admit some uncertainty as to the condition of the decidua in a majority of cases as this structure has not received from me the same degree of attention as the chorion itself. The change extends itself in various degrees of intensity from a mere granularity of the cell substance to its total or nearly total conversion into oil-globules, hemolytically well-marked. It is often associated with a more or less well-marked. It is often associated with a more or less
stage is much less commonly met with, namely, mucoid degeneration. As might be ex-
pected one finds that the structure chiefly in-
fluenced in this condition are the layer of gelatin-
ous tissue intermediate between the chorion, the
amnion, and the villi which contain a prolon-
gation of the same substance. The increase development
of the mucous material does not in all cases result
in an overgrowth so palpable as that of the "hydrated
mole" nor indeed is it limited to those spec-
imens of abortion which contain as focius in
its less evident forms it amounts to nothing more
than a distinct though not great excess of mu-

cous tissue in the intermediate layer and the
villi. The other fetal membranes likewise afford
evidence of mucoid transformation; this does
not seem to be limited to the intercellular
substance but the cell protoplasm also presents
a granular appearance, the granules being hardly
dark enough to their on thin to be fatty but sug-
gesting rather a mucoid or albuminoid struc-
ture. The possibility that they consist of mucin
is further commended to us by the fact that
some of them have a vaculated appearance not
the least interesting feature about these examples
A slightly mucoid change is noticed in the villi, which in one of my post specimens, are studded over with minute translucent bladder-like dilatations. These in turn are seen branching out. Still smaller pediculated buds from this substance which, in the manner of the large-segment globules of the hydrated mole to which I shall shortly refer. The explanation of this state of matter is not difficult. If we examine under a low power of the microscope the structure of villi which are free from this mucous change, they are seen to possess rather swollen and clubbed extremities while their stems are not everywhere of equal diameter. Present lateral branches, both here and there undeveloped bud-like offshoots. Every such dilatation without doubt becomes, under the influence of mucoid degeneration, a small cystic glistening substance. Some of them in like manner the parent cysts of other smaller processes of the same kind. These observations naturally lead up to the consideration of the more advanced phase of this morbid process which is easily recognized as the hydrated mole. Most fre
are familiar with the two rival theories which have been brought forward to explain the pathology of this singular formation, namely that which maintains that the hydadenoma is due to a mucous polypoid condition originating in the uterine glands and on the other hand that which assigns as its cause, mucoid degeneration of the villi. It is not difficult to understand how this difference of opinion should have arisen when one remembers that these jelly-like swellings are in these cases, so entangled in the decidua that one tissue can hardly be distinguished from another. As regards the first mentioned theory however, it must be evident that we do not know of any pathological change which is likely to bring about especially within the short period of pregnancy such widespread perversion of the uterine glandular structure unless indeed we conclude that the mucous glands serve as receptacles for the villi, and this view as already stated is not borne out by the results of investigation. Were it not so, it would indeed I allow be difficult to avoid the impression that the blocking of the glands by
villi must lead to the formation of a cavity or cleft in the decidua and this is an occasional and diseased condition but as a normal occurrence. Apart from any theoretical reasons however there is I think more than enough positive evidence derived from direct observation to convince us that the second of the two explanations referred to is that which truly accounts for the structure of this kind of mole. By way of illustration I may be allowed to give in some detail the particulars relating to a specimen the examination of which removed from my mind all doubt as to the true meaning of this form Abortion.

**Structure of the Hydatid Mole.**

In the specimen referred to the foetal surface consisted of a moderately tough but smooth membrane while the uterine aspect was covered with gelatinous globules. These latter in direction were found to be connected with others embedded in the decidual mass intervening between the two surfaces by narrow membranes cords or bands. These bands present a branched appearance and evidently consist of the villi which are beaded here and there with
recorded, there in turn being connected by fine stalks with small branches of the same kind. On injecting one of the larger globules with carmine solution, the fluid was found to pass into the smaller cystic buds attached to it and also to travel some distance along its stalk and into one of the secondary branches of the latter, though not into the globe in which this terminated. A transverse section of one of the globular cysts showed under the microscope

1. a delicate homogeneous outer membrane.
2. within this a granular fibrillated stroma containing a number of small rounded cells with a single nucleus, the cell-body about the size of ordinary leucocytes.
3. a central cavity partly filled with similar fibrillated and cellular tissue, resembling mucous material.

A chemical examination was made of some of the clear fluid contained in the globules, which however was not quite pure but was killed with a little blood and some of the substance of the globules themselves, gave on heating on the addition of dilute acetic
acid, a milky reaction which partly disappeared on adding an excess of the acid. It appears therefore to have been composed partly of albumin but partly of mucin. From these observations I conclude that the hyalid mole consists for the most part of villi which have undergone mucoid degeneration with the formation of cysts which like the stalks supporting them are filled with the mucilaginous product of the degenerative changes so that this product is structurally continuous with the mucous tissue outside the common which has been seen to be increased in quantity in those cases where the most marked change is less marked, but still shows to a slighter degree the hyalidiform appearance of the villi. A slight degree of degeneration which consists in granulation of the cellular and intercellular protoplasma is far rarer, a cloudy swelling, in met with in some cases I doubt whether this is sufficient to lead to abortion. It existed in the specimen which I have mentioned as an example of an apparently normal ovum prematurely expelled.
A trophy of the ovum appears to account for a certain number of miscarriages, or at all events it is the principal change observable in them. In such cases, one finds a granular change in the cell protoplasm of the chorion and amnion, and I have noted in one case of the decidua also. The protoplasm is also diminished in quantity, so that the cell-nuclei appear to be less covered than usual. It is also significant that the intermediate mucoid layer is Secretary, and the amnion is dry, gland away from the chorion on the forcible exit of the foetus and forms a collapsed balloon at the end of the umbilical cord. This occurred in one of my fatal cases. I have noticed total detachment of the ovum in two other cases where the mucoid layer was the seat of marked fatty change. Carneous Trocle. This product of miscarriage, though it owes its causation to another agency than degeneration—namely, injuries may also show signs of the first named morbid change in the fetal membrane and
decidua. The principal feature is however, the effusion of blood between the villi and decidua in such quantity as practically to form outside the ovum an investment of partially organised blood clot. The ovum thus invested is not necessarily at once thrown off, but may be retained for a longer or shorter period. It then appears to act somewhat as an irritative foreign body which stimulates the growth of the decidua or some part of it so that it forms an adherent coat covering the villi. This, at any rate, I would suggest as one explanation of the structure of the thick fleshy coat formed by some shrivelled specimens of this kind of abortion. I have seen one specimen of homolargic abortion which was not at all but contained a disproportionately small portion and might therefore be regarded as marking a transition stage, the ovum clearly having been retained long after the death of the foetus. In this case a truly cancerous condition did not seem to have been reached but the clot surrounding the expelled ovum had a somewhat cent appearance. The
microscopic in this class of cases reveals a, might be expected, the presence of a number of small round cells resembling red corpuscles though not always readily recognisable as such, in the clot area. As has been said, sometimes signs of a fatty change in the fetal membranes.

**The Etiology of Abortion.** It is no simple matter to penetrate the obscurity with which surrounds this subject and to expose an undoubted cause for the expulsion of the ovum.

As regards the mechanism of the process, there is no great difficulty in understanding how the mere presence of what has come to be virtually a foreign body in the uterus, may set up contraction of that organ either as has been shown by Baedke & Hofmann through the hypogastric nerves or through the centres of the sacral nerve, and also how strong emotion acting through the central nervous axis may induce the same effect, but we look for more by way of explanation than this. In searching among more obvious conditions for the probable causes or causes of miscarriage apart from actual violence, one observer two factors as
commonly present which afford at least some fast hold for the further progress of inves
tigation in this direction. These are: (1) the fact already insisted on, of retrograde change
tending to loosen the attachment of the ovum
to the uterus, and (2) some act of
distraction on the part of the mother, some ex-
citement or shock which has the effect of a
direct difference of uterine contraction which
in the more potent because of the change referred
to. Notwithstanding that this defect in durable
agent may be attributed to a variety of
circumstances arising in one case as the se-
quell of inflammation, in others from specific
treatment, the failing sexual power of middle age,
from anaemia or other form of general weakness
of the like, it proves in every case the existence
of malnutrition and consequent insufficiency in
the ovum and its uterine adjuncts, or this state
of malnutrition once established, abortion
is no remote possibility. The question now an-
swers whether the failure of nutrition is to be at-
tributed primarily to a defect in the growing
the factor or its enveloping membranes or in
that of the maternal structures. In modern
may take it as certain that the absence of the factor is to a greater or less extent accountable for the pathological changes apparent in the ovum. In cases where a factor has been formed but is small out of all proportion to the amount of its membranes, or to the stage of pregnancy, there can be little doubt that early death of the ovum, by removing the natural stimulus of growth, has been encouraged, the process of degeneration in the membranes. In all such cases indeed the nutritive efficiency of the maternal tissues up to a certain point is proved by the fact that the attachment of the ovum to its decidua is maintained, and that its development though accompanied by degeneration, continues for a considerable period after the factor has perished, and this would seem to indicate that normal growth has been first arrested at the latter. It does not necessarily follow however that it has been arrested by a cause primarily operative within the factor alone or even within it at all. In some cases the cause of this arrest in rather to be looked for outside the ovum itself as for example in the cavernous mole where decidual
haemorrhage is the first evident sign of diseased action, the ovum being subsequently retained in utero and undergoing the while progressive changes. Say, in the case of mole, generally, the very frequent absence of any specific tumefaction, or any other clue which might guide one in blaming a cause first active in the embryo for the subsequent steps of disorder in the ovum, leads me to think that these have some other explanation. They seem to depend upon a process affecting simultaneously the different structures of the ovum, a languor of nutritive action in the maternal tissues which, sufficient to maintain arrested growth for a time, does not suffice for further development. Constitutional feebleness in one or both parents, an unhealthy state of the uterine mucous membrane, syphilis, renal disease, the failure of sexual function at the menopause, or among the causes which tend to bring about the condition, and there is little reason to assign to one or other, a special tendency in this particular. In passing from the mole formation to those cases in which the ovum is found to contain a fetus of size proportionate to it, one has to be guided in determining the original seat of
destructive changes by acting the front at which these are most advanced as far as present by the parenteral history, and though it is not always possible to decide this point clearly, the chances are that as a rule, failure of nutrition has begun at the attachment of the ovum in utero and in the maternal tissues. In considering the various causes which tend to induce abortion, it will be best to take them in order as they particularly affect (1) the foetus
(2) the uterus & decidua
(3) the system of the mother generally.

1. Causes acting through the foetus. Of preemi-
nent among these is Syphilis. It is possible, certainly, that an infected mother may commu-
nicate this disease to her offspring still in
utero, but we have also without doubt suffi-
cient proof to show that the foetus in other
cases is itself directly inoculated by a
Syphilitic father. The frequency with which
the signs of the disease appear in the mo-
tner two or three months after conception the
fact that there are of the secondary char-
acter & further that the fact embodied in
Colles's law such a mother even though she
have herself shown signs does not in so far
contract the disease from her syphilitic offspring
while healthy wet nurses have been known
to acquire it in this way, all point to the conclu-
sion that the semen of a syphilitic father can
counteract the mother's actin first
upon the fetus. It follows therefore that there
are cases of premature birth in which the latter
exhibits at the earliest of bone growth, in the
skin or viscera, in fact in any or all of its more
actively growing tissues the signs of syphilis;
are not uncommonly due in the first instance
to foetal inculcation by the father, the accom-
pnying signs of disease, inflammatory or de-
gerative, in the placenta or decidua being
these cases consequent upon the former. With re-
gard to other disorders which injuriously af-
fect the fetus in the first place, our infor-
mation is still far from definite, my own
experience tends rather to confirm the view
that the morbid influence is working on the
father acts by lowering the vitality of the
maternal tissue.

2. Causes referable to the uterus or deci-
dua: without considering morbid
influence, which affect the uterus secondari-
ly as a part of the general system of the mother,
may easily find certain fruitful causes of
abortion in the immediate neighborhood of the cone.
Alters displacements for example are certainly
answerable for a proportion of cases of miscarriage.
The history of one such which I have
noted records that eleven successive pregnancies
had been prematurely terminated at from three
to six months after conception and that the only
cause discoverable, is that a sufficient one
was adhesions of the endometrium to have existed before
marriage. The passive congestion of lower vessel
which is chronic in such cases, its tenden-
cy to exaggeration at the menstrual periods
its influence in impairing the nutrition of
the uterine mucous membrane taken with
the fact that the grand organ does not rea-
duly rise above the pelvic brim as in the
case of development will explain the
rational of abortion due to this, indirectly
of the same event when associated with
other forms of displacement.

Accidental hemorrhage which may be due
to constitutional or local disturbance.
practically signifies detachment of some part of the uterus or placenta, should that structure be removed from the uterine surface, it is already mentioned another cause of abortion. At the same time it should not be forgotten that the tolerance of the uterus in such cases is considerable. One should therefore within reasonable limits give a preference in treatment to those hemostatic measures which tend to induce labor. Endometritis, obtained probably with justice for a certain proportion of early abortions as well as of premature births at a later stage. Particularly is the tendency observable when it coexists with a condition of general physical weakness. In one of my own cases, the mother was a flatly woman of slimmons type & lean con-

scious, absent in the intervals, appeared to be regularly induced by pregnancy. She had one miscarriage, or premature birth of eleven pregnancies & only two living children. In two of her pregnancies she suffered from dysuria, though not subject to this at other times & was not syphilitic. Evidently here uterine mucous surface of low tone, cooperated
with a weakly irritable nervous system is
preventing full development of the ovum.
Local mechanical inducements to abortion
are only for a pressing notice. They naturally
operate with greater effect when the attachment
of the ovum is loosened by disease or con-
stitutional weakness in these persons in whom
an irritable nervous system too easily respond
to almost any stimulus of uterine contraction
this mechanism depends upon partial detach-
ment of the ovum with haemorrhage, or upon
escape of the liquor amni, either of which oc-
currence by giving to the ovum the effect of a for-
egn body would cause its expulsion.
Inflammation at the placental site or in the de-
cidua, if the former structure be not yet formed
has been regarded, doubt, as another cause of
miscarriage. In examining the structures in cases
belonging to this category it is somewhat diffi-
cult to arrive at certainty as to the presence
of inflammation, the tissue being disorganized
by degeneration. The condition is to be recog-
nized by the characteristic presence in the de-
cidua of membrane on the ovum of leucocytes
and proliferated cells belonging to those tissues,
with some local hardening and calcareous change in the blood vessels. I must admit that as regards my own specimens, the only clue to inflammatory change has been the presence of cells resembling leucocytes in the decidua in two cases, some signs of cell-proliferation in the foetal membranes of a third. That inflammation plays a more important part in the production of abortion than is generally understood or however very probable, since several fits admitted causes as fever, syphilis, & endometritis, with uterine or foetal manifestations are allied in character to or are identical with inflammation.

3. Cancer acting on and through the general system of the mother. In this connection, the maternal age is a factor which should not be overlooked. As one cannot in the majority of cases exclude the possibility of the action of other causes it is difficult to assign to this its precise significance but it is at all events reasonable to suppose that the period of the menopause is prejudicial to the development of the ovum. Cataclysm at that period the
... uterus of multiparae is particularly liable to endometritis, irregular & profuse menstruation, & the adverse conditions combined with an abnormal nervous irritability affecting the whole nervous system, but the contrary influence which these act on early pregnancy, it cannot be doubted, is strengthened by a parallel process of decay in the uterine function with its associated constitutional conditions. When again, it is found that the subject of a miscarriage is suffering from anaemia or from some exhausting disease, pathies for example of the tissues of the womb are in a state of degeneration, whatever the direct stimulus may have been one must allow that the general want of maternal tone has told against the growth of the ovum & so has contributed to its premature expulsion. The influence of continued mental strain such as anxiety to which abortion appears to be in some cases distinctly traceable is probably of the same sort, while fright & other sudden emotions act in all likelihood more directly as stimuli of uterine contraction. Also some excess in some persons associated...
with so marked a tendency to abortion as to suggest the strong probability of it being a predisposing if not even an exciting cause. This may be attributed in some cases to passive congestion affecting the uterus and decidua due to infections of the liver, in others to accidental falls or strains, but with every allowance made on these grounds, the fact that the nervous centres are undergoing frequent or constant stimulation by alcohol while the mucous membranes of the uterus are not only irritated by the same means but is subjected to the impulse of a too rapid blood-stream driven by the overexcited heart is sufficient to account for this tendency. The same explanation suggests itself as that most suitable to the case of acute fever, the influence of which in cutting short the course of pregnancy is well-known. In all such and in ordinary inflammatory states, also there is an uncommonly well-known a marked tendency to答题, swelling of the wall, elevation of the active tissues, and there is also the congestive effect of a turbulent circulation which
is the vehicle of poison, particles, which in consequence of its very rapidly
cannot swiftly evacuate the tissues it sup
plies. These in consequence are under-nour
ished & prone to degenerate. The analog
ogy of syphilis which research has shown
to exert a selective faculty in attacking
the seats of active growth, tissue, as that
all such morbid processes as those above
mentioned will tell will double force where
development is going on. This probably
explains why foci, notably small-hot, fre
quently exert their influence so injuriously
upon the growing arm & its attachments.
Here to it must be remembered that the
sympathetic & cerebro-spinal nerve
centres connected with inflammation are
subject to trophic changes & direct invi
tation induced by their morbid blood-
supply. The prostration which precedes
death has been known to set up inter
muscular contraction & to cause abortion. In
such cases muscular contraction may best
be explained by regarding it as a form of an
physical convulsion similar in origin to the
Pharmacological sequelae consequent upon extreme loss of blood. The internal use of drugs with a view to procure abortion is a subject with which most practitioners are familiar from having had to treat unfortunate women who have seriously injured their health by means of self medication which, however, often prove unequal to detaching the ovum which is the real cause of their anxiety. Colocynthis, ergot, mace, and the mineral tincture of iron are among the substances most commonly used for this purpose.

I may here again briefly refer to my own cases in order to obtain whatever data these afford with regard to the question of etiology. The cause at work in 21 cases referred to could be arrived at from the history given by patients, were as follows: -

- Fright: 2 cases, worry or anxiety: 2 cases, overwork: 3 with mental excitement in one of these, advancing age (34-45 yrs) with leucorrhea, diabetes chronic renal disease, phthisis, or impotences in absence respectively.
- Syphilis in the family in 1, chronic in 1, retroflexion in 1, anaemia or general weakness in 5.
In one of these there was cardiac disease in both parents; in another child in the mother, one was procured, another probably induced also.

The treatment of abortion.

From the above-mentioned pathological conditions it follows that notwithstanding a certain sameness as to general procedure, the details of the management of abortion must vary a little according to the cases, operative in different cases, the stage of pregnancy and the form assumed as in the process of expulsion of the womb. Bearing this fact in mind we shall best understand the subject if we study it first in its morphological aspect and afterwards take up the practical measures imposed upon us when the miscarriage is inevitably unavoidable.

The prevention of abortion.

When a tendency to miscarriage is known to exist, it is our duty if we can to trace it to its source. The womb perishes from some cause of malnutrition. What is this cause? Are we to look for it in a malposition of the
uterus, in persistent endometritis, or some form of constitutional faintness or weakness in either parent. Whatever its nature, the principal and rational treatment with a view to maintaining the course of pregnancy must be its removal. As regards malformation, the success with which it lends the bearing of a marrnov necessarily depends upon the mobility of the uterus and somewhat on the duration of the displacement, as the presence of a desease outside or of a marked degree of chronic congestion of the organ is sufficient to defeat the salutary effect of the instrument. Otherwise, much may be hoped from its use as common experience testifies. Persistent endometritis certainly a barrier to success in childbearing but one is sometimes astonished by apparently glaring exceptions to this rule. I can recall the case of a patient of my own who in addition to having an anteriorly placed cervix had copious leucorrhoea with a granular state of the uterus. She wore a Gravely - Hewitt's cervix for some years
and mistake of the consider a bro three
or four living premature children which
died a few hours after birth some at full

time which lived. The treatment of the va-
rious constitutional state, which tend to
cause abortion since these act largely by
curving the nutrition of the womb, should
include as a prime requisite the adminis-
tration of a liberal though judicious diet.
way, moderate exercise in the open air, &
such medicinal remedies, if any, as are like-
ly to strengthen the general tone. When we
find the subject of a miscarriage as hap-
less not infrequently, to be a weak tan-
emic person whose pregnancy has been ab-
ruptly terminated by some trivial shock
or change of an action which appears quite
unusual to the result we can hardly avoid
the conclusion that had the patient been
assisted by such measures as the
above the full period would probably have
been reached. Of course there must also be
often required the measures treatment need-
ful to combat any particular disease,
whether such as cardiac, pulmonary,
venereal disease, or syphilis, which at present cannot but impair the tone or function of the uterus as of any other organ. The injurious influence of syphilis can certainly be controlled during pregnancy by specific treatment. This fact which is now commonly accepted by the judgment of medical practitioners is one of much practical value. In common with many others I have had occasion to endorse its truth with confidence. On the professional experience although it has not fallen to my lot to note anti-syphilitic treatment has distinctly obviated a tendency to abortion. At the same time, the proved curative value of mercury in this disease, their apparent efficacy in securing the birth of children of syphilitic mothers who without such treatment have repeatedly had stillborn offspring should suffice to recommend their use when syphilis appears likely to cause miscarriage. We may now pass on to consider after the stage of procedure than that of prevention. The treatment of abortion when imminent or when actually progressing. Among the earliest
Premonitions of a coming miscarriage are hemorrhage, slight, though repeated pains resembling in their text character the pains of labor. The hemorrhage may be only an effect of uterine contraction which in obedience to another cause, is detaching the ovum from its seat. It may or it may not be the primary cause of abortion; at all events the earliest step in the process of the stimulus of contraction. The uterus at this stage is not dilated. The ovum can not be felt throughout. The object of treatment in the circumstances is really to prevent miscarriage for this account should include such means as are most likely to keep the uterus at rest and exclude those which have a contrary tendency. The recumbent position persistently maintained, the lips being raised, a bland and cool diet without stimulants, a low bedroom temperature are measures of obvious value. As to drugs it is pretty generally admitted that none are likely to prove more serviceable than quinine or chloral, preferably the former both as being a more efficient analgesic.
chiefly in consequence of its action as a means of ensuring quiet sleep. As the
apomel may have to be given for a considerable time, it is best combined
with a somewhat smaller dose of belladonna. To mitigate its toxic action in
interference with digestion & the regular movement of the bowels, it is best
when given as a matter of routine practice in such cases, even when guarded
by the apomel, subject to this
chilled vantage point that it can only arrest haemorrhage by exciting uterine contraction &
even then its action as a uterine cannot
always be relied upon. I doubt much if at
any stage in the treatment of abortion this
drug need now be employed, certainly in
case of haemorrhage at an early stage, there
is much to be said in preference of other
agents, especially namamelic, which is not
only a much more effectual uterine but also
from any uterine action. I have also
used acetate of lead with evident benefit.
When at a later stage, the process of abortion
becomes set in, opium or a different line of
practice becomes necessary to naturally di-
invisible into two parts. 1. the treatment of abortion that has fairly commenced to force the expulsion of the ovum.

2. The treatment of the patient after its expulsion.

The treatment of actually progressing abortion. Examination at this stage reveals besides the symptoms of increasing pain and bleeding an os uteri commonly patent through which the finger can feel the soft protruding amnionic sac. There is little likelihood at this stage that miscarriage will be averted. In the hemorrhage we have proof of partial detachment of the ovum from its decidua while its presentation accompanied by recurrent pain proves that uterine contraction has advanced considerably in the work of expelling it. If the ovum be well felt we are still justified in waiting for further indications the lying mean time chiefly upon rest and opiate. If on the other hand it be distinctly recognizable, if as may happen early, the amniotic fluid has escaped, especially, if hemorrhage be a marked symptom, strong or measures are imperative. In select
ing there however it should be remembered that abortion at whatever stage in pregnancy is but a mimic labour and that whether the attachments of the chorioamnion be loosened by degenerative change or no, but particular
ly in view of the probability that this has occurred, it is well to let nature expel the uterine product if she can without directly interfering with her efforts. Even where, as in the case of the hydatid mole, there is close some time) deep adhesion between the uterine cervix and the placenta, the jelly-like chorionic villi penetrating deeply into the muscular substance it is well to trust largely to natural conditions for contractions. The effect of the steady, undulatory, and repeated contraction of what is practically a muscular sac must, if they be maintained for a sufficient time, accomplish the evacuation of such a sac more cleanly, effectually, than if its contents be sought for and uncer
tainly, stripped off with forceps. even with the finger working more or less in the dark through the orifice of a narrow tunnel such as the passage through the cervix at
eri. If the cervix be ruptured, there is the more reason to postpone any attempts at mechanical extraction. The contraction of the uterine muscle acts as an elastic band against the dilating cervix and the conditions are identically those of the first stage of labour at full term with this difference, that there is a strong probability that if the case be left to nature the amnion will remain in the uterus last, if at all uncommon, happens the complete amnion when expelled will bring with it a considerable part of not the whole of the decidua. If, on the other hand, the amnion has given way, the amnion no longer acts as an elastic dilator of the forceps which it afforded to the uterine contractions, while still entire, increased in proportion to its diminution in bulk. Even then, however, its presence as a foreign body cannot fail to stimulate the expulsion power of the uterus material to assist its own exit and it is therefore in my opinion good practice to wait for a time in such cases to rely upon the efforts of nature. There are however, a few cases, in which,
critical importance, in which pain or other evidence of such efforts is practically absent, and the uterine inertia is associated with firm adhesion of the placenta & membrae to the uterine wall. One cannot in presence of such a condition, long defer interference lest the next indication, be that of septicaemia. In such circumstances, it is best to clear the uterus of its contents early with the finger & of needle, & it is almost certain to be the case, with the aid of chloroform. The womb forces under such condition, ought I think to play but a subordinate part since it can never equal in accuracy of result, the more sensitive & mobile finger; & in all cases is able to cause bleeding without removing enough of the womb to do real good. In all our waiting too, we must be guided & governed by an all important consideration, the amount & duration of haemorrhage with effect upon the patient. Fortunately, the uterus being comparatively small, the haemorrhage which accompanies abortion during the earlier months of pregnancy is
not as a rule difficult to control. A vaginal plug of carefully applied being quite sufficient to arrest it, and possess- 
ing moreover this advantage that it encourages the uterine contractions. Even of the haemorrhage best slight it is, I think desirable to apply this form of plug in any case of abortion which it is intended to leave for a time to itself since the prompt detachment of the womb may at any moment lead to serious bleeding. Various ready methods of plugging have been used with effect and the simplest treatment are in so far the best in an emergency. The insertion of a soft handkerchief entire or torn in strips or a sponge which has been kept in an antiseptic solution (about for which I am in- clined to a brother practitioner) are methods which if not elaborate are most easily applicable. It is certainly preferable however to use when possible an absorbent material such as lint torn in strips about an inch long and one or half an inch wide moistened but not soaked in carbolic acid, oil for this purpose. The
After it should be somewhat dry to act to preserve their absorbency, care should be taken in packing the uppermost piece to fill the spaces and to smother the centre in order to gain the full benefit of local pressure in arresting the bleeding. With this object it will be found that a Marion Jones' scissor slum is most useful in dilating the vagina of thus giving the operator in this manipulation. This form of plug need not be removed within a less period than 10-12 hours but it will not uncommon, be found that after remaining in situ for a considerable shorter time it has been expelled by the uterine contractions or become upon its summit the expelled portion. Haemorrhage now ceases very greatly abated and a second plug is usually unnecessary, but one should be inserted if the appearance of parts seems to indicate that part of the ovum or decidua remains undischarged & is likely to be expelled naturally. As haemorrhage not being as yet entirely controlled in such cases the uterus not being however, as before mentioned, I should prefer not to wait nor to use a plug.
which by retaining discharge, in an attempt to encourage aseptic process but as already said, I would interfere early and decidedly in order to remove the notable adherent ovum. In any case where the plug has been used its removal will follow by douching the vagina and interior of the cervix uteri with an antiseptic solution, preferably one of carbolic acid or of a mixture of this with tincture of iodine. Further details, relating to the mode of material, most suitable for the douche may in the meantime be deferred. If hemorrhage be severe or the amniotic sack either broken or otherwise still dilated, or if it have been dehiscence still continues to flow though less freely, the patient being exhausted by the ovum still retained in utero, more active measures are called for. In such case, it becomes necessary to plug the cervix for the double purpose: to hinder the escape of the retained ovum by forcible obliteration of preventing any further loss of blood. Attempts to introduce a tent into the cervix without previously fixing it would be of no avail.
however, apt to end unsuccessfull.

The state of the patient, the mobility of the uterus, or the disadvantage of having to rely for guidance only on an uncertain sense of touch combine to render another less readily method more practically useful. This consists in exposing the os uteri with the help of a speculum (though this part of the process may sometimes be dispensed with), fixing downwards, the anterior lip of the cervix with a valsalva or sharp hook, fourth an ovum forceps or tena introducer, passing through the cervical canal a sponge or tangle tent moistened with an antiseptic lubricant as nearly as possible, just thick enough to fill its lumen. The tent which must traverse the whole length of the canal should be prevented from slipping out by placing behind it at the os uteri a plug of absorbent wool soaked in glycerine alone or what is better, in some one of its stronger antiseptic combinations, such as grec in of corrosive sublimate (1:2000). The patient may now be left at least a 1/4 of a morphia suppository or alone of laudanum.
(about mxv) being administered, repeated if needed to allay pain while dilatation is proceeding. It is a practice with some to assist the action of the vaginal plug or the tent with a full dose of ergot by the mouth or with a deep intramuscular injection of ergotinine. Such a proceeding I do not consider really necessary, the stimulus of the plug or tent being sufficient to maintain uterine contraction. Some practitioners object, notwithstanding, reason that any advantage obtained by the use of this drug in such cases is counterbalanced by any deleterious effect where dilatation is ensured by the tent, by its tendency to cause tight constriction of the os and thus to interfere with the extraction of fragments of the cervix. Some regard the use of the tent one or two hours as not necessary. The tangle tent from its less absorbent character is in my opinion preferable on the whole to one made of sponge as being less likely to retain atomic discharge. Its disadvantage is its usual small size through this may be overcome by inserting more tent - than one or by using a thicker kind combined.
al narrow tongue strips united together. Another point of manifest importance while in case the plug or the tent is used is that care be taken to secure the latter to the mucous of which compose the former with a ligature to prevent it from slipping in to the uterine canal and giving rise to mischief later. The use of the vulsellum or sharp hook to fix the convix in a practice which cannot fail to commend itself. By traction on the anterior lip it straightens the cervical canal and overcomes the difficulty arising from the naturally somewhat anteverted position of the uterus, or thus facilitates a marked degree the passage of the tent which on the withdrawal of the hook is held in position by the forward inclination of the liberated organ.

In carrying out these manipulations skilled assistance can usually be dispensed with a matter of some consequence to practitioners in isolated situations. An intelligent female attendant can usually be taught to render all help that the practitioner will require. After twelve hours the tent will have accomplished the work of dilatation and traction may be proceeded with.
If moreover the canal be not yet sufficiently patent there is nothing for it but to introduce one or two sponge tufts of sufficient size to guarantee its complete dilatation having first applied an antisepsic drench to the interior of the uterus to ward off the result. The vagina fully dilated the extraction should be carried out with the finger or partly through a rectally with the corner Jercsy, the uterus being at the same time pushed downwards by anterior abdominal pressure with one hand. If in the case of some multiforme the vagina be sufficiently dilated to allow the introduction of one hand a further advantage is obtained, it may be possible without much difficulty to detach and remove any remain of the womb or decidua with the finger alone. In such a case I prefer the left hand for introduction asking the smaller. In many cases of abortion either from narrowness of the cervical canal or from its high position in the pelvis, it is impossible to extract the entire womb with the hand without inflicting great pain or indeed to extract more than part of it at all in this way.
In such a case the administration of an anaesthetic is of the greatest service. At some times indeed, an imperative necessity both in order to obviate syncope which readily occurs in the circumstances in a weak patient, and to facilitate manipulation by relieving uterine spasm. It should be remembered that especially in cases where a drop not noticed the placenta is formed & is adherent, no instrument is so reMable either for diagnosis or detachment as the finger passed into the uterus up to its very fundus. It will often be found that some fragment of the ovum decidua, or placenta remains adherent to the uterus in spite of all ordinary efforts to remove it; but we have reason to believe that it is neither large nor firmly attached. In such a case the ovum forceps is most useful. In employing it, the vulsellum & if needed the speculum, should be used to fix & expose the cervix uteri. In using the forceps care must be taken to sound well the depth of the uterus with it & to detach every adherent fragment, the instrument being used partly as forceps, partly as curette.
scraping the uterine interior at all points till it is felt everywhere to scrape upon the hard resisting structure of the organ. The curved forceps described in for this latter purpose is for general use much better adapted than the ordinary straight instrument. It is true that such fragments do not always become the starting point of serious acute changes but sometimes remain quiescent until they are separated from the uterine wall by a slow and trifling inflammatory process. This happened in a case for details of which as well as for the opportunity of examining the specimen obtained from it I am indebted to the kindness of a brother practitioner. In this instance a fragment of the chorion was retained in contact with a part of the decidua layer by a clot of blood interposed between the two till the latter was detached and described of the whole was cast off some seven weeks after the rest of the wound. It will commonly be found however that one or at most two careful explorations will suffice to prevent the onset of such complications. The evacuation of the hydramnion...
must be carried out on the same general principles. Had any suspicious symptoms appeared to indicate that this body was retained in the uterus, it was causing irritation, it would certainly have been sought for and removed. As it was, we have in the details of this case a proof of the occasional tolerance of the uterus with reference to fragments of this description. It is certain, however, as a rule, to remove as far as possible every portion of the ovum and decidua which is not easily cast off by a natural process. At the same time, excess of manipulation is to be deprecated, one must carefully distinguish between adherent portions of the ovum and mere roughnesses of the uterus interior which obviously should not be interfered with. If, after careful manipulation, there only remain a few light shred or pieces of blood clot, it is better to allow the uterus to cast off these than to harass it by continued interference. Should any signs of uterine or constitutional disturbance indicate the beginning of septic mischief
In any such retained portions there will as a rule, still be time to complete what little remains of the work of evacuation. It will commonly be found however that one or at most two careful explorations will suffice to prevent the onset of such complication. The evacuation of the hidupled tumour must be carried out on the same general principles. It is particularly necessary however in this case to remember that too much force must not be used in extraction as some of the mesentery vessels are apt to be deeply embedded near the peritoneal aspect of the uterus and we must therefore while extracting all we can rather avoid than seek to remove such deeply seated portions lest we encounter the risk of causing peritonitis or even actual rupture of the uterine wall.

Before leaving this subject a word on the structure of ovum forceps may not be out of place. The ordinary straight forceps is a useful and efficient instrument. When the uterine cavity is crowded or blocked by the vulsellum fixed on the cervix it is perhaps not much inferior to that
which I shall now describe. The latter possesses in its greater length, its greater ease in introducing conformity to the normal uterine curve, certain advantages which deserve notice. It is an instrument designed by my brother Dr. Alexander Morrison and consists of an ordinary pteropetal forceps opening laterally. The blades terminate each in a loop-like extremity which is grooved round the inner surface in order to enable it to grasp more securely any captured shreds of tissue. Throughout the course of treatment just described, antiseptic and aseptic cautions are very necessary in order to prevent the conveyance of contagion by tent instruments or hands. More particularly, however, are they called for when the uterus has been cleared of its contents and there is no more rational proceeding than the antiseptic irrigation of the uterine cavity at this stage. Some caution, I consider, should be used in regulating the strength of the solutions used. I cannot but think that the repeated use of injections of the strength of 1 part of carbolic acid in 40 of water to be recommended. As an occasional application...
now, this strength is doubtless useful, but where the douche has to be repeated frequently, 1 in 100 should be ample, strong enough, and commonly use a mixture containing 3/4 of carbolic acid to 1/4 of water. A very effective solution can easily be prepared by adding to the latter 3/4 of Tincture of Iodine. The advantage possessed by somewhat weak but effectual solutions, like those above mentioned when used in large quantity or others of the same kind but more potent is that they irritate comparatively little, while they effectually remove notions discharge. I think I have observed distinct benefit from the substitution of the weaker for the stronger solutions. I should certainly prefer to use them as a rule rather than run the risk of setting up an irritative even if an aseptic inflammation. None of these douches however so suitably unite a strong disinfectant property with a minimum of irritation as the 1 in 2000 or 3000 solutions corrosive sublimate. It should not be forgotten, moreover, that much of the value of observation depends upon the quantity of the
Solution used of the fact that it is hardly possible to exceed in this respect is an additional reason why injections ought to be weak rather than strong. For the purpose of evacuation through a patent cervix such as is now supposed to be under treatment, the ordinary Higgins' enema syringe, with a cannula tube preferably one of glass, is useful. For an instrument as need be employed. When the cervical canal is imperfectly dilated, other appliances are sometimes more convenient. One or two of these will be shortly described.

Septicaemia & its treatment constitute the most important subdivision of our present subject. Mention has already been made of the close connection existing between the premature ovum & attendant. It may easily happen especially in the placental area that this connection is not completely severed when the rest of the ovum is detached. Small adherent shred, clot, or intrauterine lacerations, exist under the poisonous action of lactual discharge, the seats of septic infection, or unhealthy sit...
- morphic surroundings apart from the retention of any of the ordinary products of
abortion may easily induce asimilar morbid change. The symptoms of high tempera-
ture preceded by rigor but not necessarily
attended with marked change otherwise.
4. footed vaginal discharges are the familiar
indications of the onset of this morbid pro-
cees, though singularly enough with the exce-
tion of fever, its manifestations are apt to sub-
side somewhat on time passing. Local pain
of present previously, or the odour of the discharge,
never a strong diagnostic feature since the
lochia after the first day are in any case
unodorious, cease to attract notice. This
subside of symptoms is not however a
favourable sign in many cases since it is
compatible with the transformation of septic
in chief from the uterus lining which
has in great measure passed away in
the discharge, to the intricate network
of blood vessels which are more deep placed
in fatal cases the latter are often found
to contain septic thrombi while the site
of placental attachment shows only a
gramating appearance with slight
simplish discoloration. It is well to the
point of treatment or diagnosis when
sore suddenly develops after abortion it
read not accounted for by extrauterine cause
nor can be distinctly traced to the
uterus to try the effect of the antiseptic
douche. If this check the rise of temperature
decidedly the existence of septic change is
practically certain. The practitioner must then
proceed to combat the evil. Douche may
possibly suffice but should the temperature
continue to rise during the intervals other
administration is clearly advisable to
place the interior of the uterus remove any
remaining traces of the worm with the for
ceps or curette or if decomposing blood
clot. Irrigation may have to be kept up till
a continued abeyance of symptoms have
rendered them unnecessary. It is in such
cases that another form of instrument than
Higginson's syringe is useful. The centri
ere of patent to begin with, soon contracts
+ a narrow tube is therefore advantageous.
A very ready & efficient method consists in
Attaching to a No. 10 or 12 gum elastic catheter a long indiarubber tube of corresponding thickness the opposite end of which is fitted with a simple glass or metal syphon, so that the apparatus, previously filled throughout with an antiseptic fluid, may be used as an easily applied and continuous, acting irrigator for any length of time that may be desirable. My own ordinary practice is to fit an ordinary gum elastic catheter by means of tubing to the enema nozzle of a Higginson Syringe, & inject about one-tenth of the required solution. For cases such as those now under consideration, that swirling the interior of the uterus with strong antiseptics such as the mixture of Iodoine undiluted has been advocated & the utility of this method is manifest in cases where septic mischief has advanced or a more tedious mode of procedure is not desirable and is necessary to place an immediate check upon the morbid action. Such interference however is not unlikely to cause considerable uterine irritation without uncertainty...
reaching the part which it is designed to treat, it does not except in such an extreme case as I have referred to, possess any distinct advantage over the irrigation plan but rather the reverse. Where the urgency of septic symptoms calls for their immediate relief & the contracted condition of the cervical canal requires its rapid dilatation, the use of graduated cones or of Simm's uterine dilator is indicated, & anaesthesia is a practical necessity.

In the great majority of cases, however, there is time enough for the gradual action of this plan where it can be carried out in certain less trying to the patient. The use of the curette in removing septic material from the uterine surface has of late years undergone a process of evolution which has resulted in the introduction among some gynecologists of a still more heroic mode of treatment. This consists in the forcible introduction through the undilated cervix uteri of a sharp spoon which is used to scrape the interior of the cervical canal uteri &
the muscular layer. Good results have been claimed for this mode of treatment, but they should I think in almost every case be at least equally attainable by less forcible methods.

2. The treatment of abortion after evacuation of the uterus. In so far as this subject is connected with the detection or cure of septic processes it has been already fully discussed. As in the happier case, while the patient is confined to her room she must be kept in perfect quiet. The lying in period must be regulated entirely by the presence or absence of complications as the return of the uterus to normal size must evidently depend upon its remaining quiet. It is then regarded as the influence of disease or surgical manipulation. The time allowed should be little if any shorter than that of women confined at full time. After all that has been stated above, the necessity of maintaining thorough cleanliness of the patient's person and surroundings need hardly be insisted on. In conclusion, I would sum up very...
Briefly my views on the pathology & treatment of abortion, the observations contained in the foregoing paper will bear me out in saying that whatever its cause the cardinal point in the pathology of the condition is its disposing cause in degeneration of the womb & adjacent maternal tissues, while the great object of treatment where prevention is impossible (and this is often successfully accomplished by the unaided uterine efforts), is the complete removal of the womb & its appendages.

B.S. Morrison
W.B. C.M.
April 29th 1892