After a few years in practice, one comes to the conclusion that the subject of abortion does not get the attention from practitioners, and perhaps from teachers, which its importance demands. The reason is, I believe, not far to seek. For the 'immediate prognosis is, in a large number of cases, favourable enough, but the 'remote' prognosis, unless a case is promptly and properly attended to, is very often distinctly unfavourable regarding the future health of the patient.

This is not infrequently, a lapse of time before the untoward circumstances make themselves manifest after abortion, and this interval in the patient's mind absolves the careless practitioners from all blame — in contra-distinction to a case of erysipelas fever resulting from full-time labor. In most British Medical Schools, 'abortion' or 'miscarriage' is applied to the interruption of pregnancy before the fetus has reached a viable age (Salkin's Manual of Midwifery, p. 430) and for the purpose of this thesis, that will be the sense in which I shall use the term. Some authorities, however, limit 'abortion' to the premature coming off of the
product of conception before the end of the fourth
month of gestation. (Platfain's Practice of midwifery
vol. I. p. 304.) i.e. before the placenta is properly and fully
formed, and before the vera and reflexa have completely
united (Palaeo's Manual of midwifery, p. 60) and apply
the term 'miscarriage' to the interruption of pregnancy
between that period, and the time at which a viable
child can be born, i.e. at the end of the sixth
calendar month, although there is little chance of the
child being reared if before the end of the seventh
calendar month (28 weeks).

I think this is a convenient distinction because, by the
end of the fourth month, changes have taken place
inside the uterus, which render expulsion after that
date quite a different matter to what it is at an
earlier period. After four months
gestation, the conditions inside the womb are practically
the same, and therefore, the treatment is, to a large
extent, similar to that at full term. It is obvious
therefore, that for the proper treatment of any case of
abortion, one should calculate as nearly as possible
the length of time pregnancy has proceeded.
By so doing, one is enabled to form a mental
picture of the conditions inside the uterus with which
one is dealing, and to treat the case accordingly.
I. The history of the child's development and growth in the uterus, as determined by X-rays and other methods.

II. The size of the child at birth, determined by X-rays and other methods.

III. The size of the child at birth, determined by X-rays and other methods.

IV. The size of the child at birth, determined by X-rays and other methods.

V. The size of the child at birth, determined by X-rays and other methods.

The following table will give some idea of what to expect at different stages of development:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Size of Uterus</th>
<th>Size of Child</th>
<th>Size of Child</th>
<th>Size of Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Medium</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Large</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

As indicated above, a half mark here is no place to stop, as many children are delivered of stillborn children.
observe a decidua serotina, or rudimentary placenta, attached to the membranes at the side of the ovum when expelled between 2-3½ months of gestation.

It will be about 1½ in. thick, according to measurements of cases I have been. After three months, the placenta is an important element as regards abortion for it is now distinctly though not completely formed. At this period also, i.e. at the fourth month, the uterine cavity is obliterated, being completely filled by the growing ovum, in other words, the decidua reflexa becomes adherent to the decidua vera (Sellar's Manual of Midwifery, p. 187; Plasserre's Course of Practice of Midwifery, vol. 1, p. 133).

Thus, in abortions, up to the end of the fourth month, we may have to deal with cases with or without a placenta, or with a placenta partly formed.

With an uterus partially or completely filled by the growing ovum, i.e. with cases where the vera and reflexa have not united, or where they have become adherent.

As one would expect from the anatomical conditions, it is within the first four months of pregnancy that abortions are most common, because the attachment of the ovum to the uterine wall is less firm during the early months of pregnancy, before the complete formation of the placenta (Gabriels' Manual of Midwifery, p. 130).
and before the decidua reflexa and vera have completely united.

Having these different conditions inside the uterus, it is only natural that the process of expulsion should have different results, that is to say, an abortion may be complete, or incomplete, and it may vary in the degree of its completeness.

Within the first two months of pregnancy, the whole ovum is most frequently expelled without rupture, and the foetus, amnion, and chorion, together with the decidua carotina, or rudimentary placenta, come away together, leaving behind, however, the decidua reflexa and decidua vera.

I have, myself, observed this several times, and the question arises from a clinical point of view, whether this should be regarded as a complete abortion and treated accordingly, or not.

One should bear in mind, that, at this point, the decidua vera is both absolutely and still more relatively, very bulky, measuring as much as 1/8 in. in thickness at the third month, (Pehle, ‘Traum of Midwifery’, p. 60) and therefore, according to my own observation, very much thicker than the rudimentary placenta. The decidua vera is already getting thinner by stretching up to the end of
the third month when the reflexa has not united with the vera, it is common for the decidua vera or reflexa to be left behind whether the ovum is implanted or not.

It has been stated that the decidua is also usually left in utero, but the very opposite has been the case in my own experience, and that is what one would expect from the conditions inside the uterus up to that period. Or the vera alone may remain in utero, and this structure is usually torn away in places, leaving fragments on the uterine wall, which in most cases comes away later in the lochia but may occasionally set up infection of tubes etc. In the middle months of pregnancy after the complete union of the vera and reflexa, which takes place in the course of the fourth month, it is common for the placenta alone to remain in situ, because the layer of the decidua serotina, just beneath the placenta has not yet got developed in it, these large flattened spaces, or layer of open meshwork through which at full term, separation is easily takes place. Besides being complete or incomplete, an abortion may be merely threatened, or it may be inevitable, and it is important to make a differential diagnosis of these varieties for the treatment is
essentially different. To complete these different forms, one must add 'miscarriage', in which the ovum perishes, but remains in utero for weeks or months. Sellet also describes what he terms 'cervical abortion'. It is a condition in which the ovum is expelled from the uterine cavity into that of the cervix, where it remains causing thickening or 'ballooning' of the cervix. No doubt such a condition does occur and I have, myself, observed this 'ballooning' of the cervix, which I have supposed to have been due to congestion. It certainly was not due to cervical abortion.

Ovary and deciduas from a specimen in the museum of the London Hospital.
Causation. It is not my intention to go fully into the various predisposing and exciting causes of abortion, but that my thesis may not be disconnected, I shall briefly mention the most common of these causes. Abortion is most liable to occur at times corresponding to the periods when the woman would be menstruating if she were not pregnant. And this is due to the increased irritability of the nerve centres and also to a certain amount of contraction of the uterus at these periods (Calabu's Manual of Midwives, p. 143).

The most usual causes are:

I. Cephalic

II. Refluxation, which may exist only at the period of gestation.

III. Laceration of cervix, which may set up reflex uterine contractions.

IV. Tubal Polypi.

V. Endometritis.

VI. Hyperaesthesia. Condition of the uterine system of nerves, "the habit of abortion." Like eczema in skin diseases, this is the rubbish heap where all those cases of abortion which cannot be otherwise accounted for are placed, and the number placed in this class will be in indirect ratio to the diagnostic skill of the physician.
Very slight emotional excitement will cause premature expulsion in some, while others, suffering even from hysterical convulsions will go on to full term.

Sir Henry Littlejohn used to say that the majority of Saturday night fights in the Cowgate took place on the abdomen of pregnant women who were aborted.

VII. Drugs:—Pergynval, ergot, and quinine are the most common.

This is a more frequent cause than most people seem to think, and I came to the conclusion some time ago when I was in a middle-class practice in Liverpool, that hardly any woman who, at the time of conception, had one living child, ever went to full term without repeated attempts to get rid of the product of conception by means of drugs. So the gill states that to attempt to bring about abortion by these means is as likely to kill the mother as to expel the foetus. I have seen many abortions produced by drugs, but no deaths caused thereby, even though some of the patients were previously in a precarious state of health from other disease etc.

Diagnosis:

One has to satisfy himself that the patient is
frequent.

To determine whether it is a case of inevitable, or merely threatened abortion.

If any substance has already been passed, whether the abortion is complete or incomplete.

It is also advantageous for the medical attendant to determine as nearly as possible the length of time gestation has proceeded, so that he may form a mental picture of the condition inside the uterus, and thus know what to expect and to modify his treatment accordingly. The three cardinal symptoms of abortion are bleeding, pain, and dilatation of the cervix. The first in point of time is haemorrhage, and not pain, in nearly all early abortions. This precedes pain, because the first contractions of the uterus are so slight that they do not give rise to any suffering, even though they are sufficient to detach some of the delicate connections between the foetal shell and the uterus. (Salah’s Manual of Midwifery, p. 434)

Some maintain that bleeding begins before any pain is felt only if it is a cause and not a result of the aborting process. (Toothdill, Midwifery, p. 162).

If that be the correct view to take, then haemorrhage
must nearly always be the cause of abortions before the end of the fourth month, but at a later period, pain may be the first symptom and bleeding may not take place till the birth of the foetus. The bleeding may be very severe, and yet the case be only one of threatened abortion. The frequency and violence of the uterine contractions are a sure guide to the determination of whether abortion is inescapable or not, and the amount of dilatation of the cervix is decisive, for if the womb can be felt through the os. with the finger (up to the end of the fourth month) abortion is certain to follow, even if the other two symptoms are not severe.

The meaning of Complete Abortion

According to textbooks an abortion is complete if the foetus, placenta, and membranes come away without any of these structures, or any portions of them, remaining in utero.

Most authorities, e.g. Saladin's Manual of Midwifery, p. 435, lay special stress upon the necessity of seeing that the uterine placenta is expelled, though the not infrequently more bulky decidua may be left in situ - at least, they do not
State anything to the contrary. If one considers an abortion at about the end of the third month, he will find in utero, a foetus containing in an ovum about the size of a goose egg, with partially formed placenta, but decidua capsularis, and decidua vera un-united, or incompletely united, and the thickness of the vera at this period is about a third of an inch. In other words, the uterine cavity is lined, except where the placenta is forming, with a membrane 1/10 in. thick, or if one imagines a section of the womb, there would be decidua 1/3 in. in thickness, and this membrane is as much the product of conception as the foetus itself. According to the figure on page 7 which is one of an ovum and decidua from a specimen in the museum of the London Hospital, I am underestimating rather than otherwise, the bulkiness of the decidua vera, and I am leaving the decidua reflexa out of account altogether, because already it is getting thinned by stretching, but one must not forget that when it does unite with the vera, it adds appreciably to the thickness of the living membrane of the uterus. In the later months of pregnancy, these membranes are greatly thinned, and so may perhaps be
ignored from a clinical point of view. But considering the relative and absolute bulkiness of these structures (deciduae) up to the end of the fourth month or so, it is strange indeed, that one is practically taught to regard an abortion as complete when they are left inside the uterus to come away, or to remain in situ, or to decompose, as if they were of no moment (Skeel's manual of midwifery p. 441). If the practitioner does ignore them (the deciduae), SanDEFAULT optionally concludes, that the Constitution of the Patient does not, and I have seen cases, where so-called complete abortions have taken place, prove clinically, to have been very incomplete indeed. One needs no doubt about the "completeness" of a case where the ovum comes away unruptured, and with the initial placenta attached, and yet I have seen a raised temperature, and a degree of Septic poisoning follow these cases, and in at least one, I have seen severe haemorrhage. Come on which I had no doubt was due to the separation of the deciduae, and the results of curettage confirmed my opinion.
A case of abortion in the earlier months
which leave the decidua behind is almost as incomplete as a case which leaves the intestines behind. I, therefore, humbly ask an opinion that an abortion is not complete either from an anatomical or a clinical point of view unless all the product of conception is expelled viz.: foetus, membranes, decidua and placenta.

Prognosis.

It should be remembered when attending a case of abortion that, whereas in delivery at full term one is dealing with a natural process taking place in a healthy uterus, in the former one is having to do with an abnormal process occurring in an uterus the vitality of which is already lowered, be the cause of abortion what it may. It behoves one, therefore, to bear in mind that though at full term the extent of surface through which microorganisms may enter is greater, yet in premature expulsion the resistance to their incursion is less owing to the already diminished vitality of the uterus. However, in natural abortion there is but little immediate danger to life, but according to such the statistics of deaths occurring in New
York, the mortality from all causes after abortion is nearly as great in proportion as that from syphilis. Fever after delivery at full term (Saladin's Manual of Midwifery p. 43). The risks incurred are Septic and Haemorrhage. The latter is seldom severe, and acute Septic Case, but the Common - extremely Common — results are Sub-Resolution, and Chronic infective inflammation of uterus, tubes, etc. which make the patient's life scarcely worth living. It is the frequency with which one comes across these women who are simply wrecks of their former selves, that makes one think that the ordinary treatment of abortion is not yet on a satisfactory basis, though one must admit that a very large number of practitioners trust to luck, and apply no treatment at all to early aborsi ons, except directing the woman to remain in bed, and dousing her with ergot. Apart from the disastrous results of incomplete abortion on the future health of the patient, one must bear in mind the possibility of 'missed abortion' when expulsion of the product of conception may occur, and absorption from it take place, though the ovum may
remain in utero for weeks and months, and be ultimately expelled in a shrivelled condition (blighted ovum), or in the form of a fleshly mole without affecting the health of the patient. 

Prophylaxis may be resolved into:

I. The prevention of abortion, and

II. In invariable cases the prevention of the serious after-effects of incomplete expulsion.

The prevention of abortion consists in seeing that affection which is the probable cause of it, e.g. if the woman suffers from endometritis or endocervitis, it should be remedies before pregnancy commences. If there be syphilis both parents should undergo a course of mercury. An anaemic woman should be treated with iron, and if placental asphyxia has occurred in a previous pregnancy, the blood should be kept alkaline with Potassium Chlorate, a drug which I have been successful after four previous abortions.

A retroflexed uterus should be replaced and kept in position by a oversew; laceration of the cervix should be attended to and fibrous polypi removed. When a hyperaesthetic condition of the uterine system of nerves is the cause, the woman should avoid mental...
excitement and muscular exertion, or anything likely to upset her nervous equilibrium at times corresponding to her menstrual periods. And up to the time when the vera is completely united to the reflexa, it is often advisable to keep her in bed for a few days at these periods, or even keep her at rest continuously if she be prepared to make the sacrifice. But rarely, however, finds that his patients are very anxious to follow his instructions and present a miscarriage, so that the medical attendant's energies will be chiefly directed to the prevention of the abortion being incomplete in the sense I have already indicated, and in the manner which will be described when discussing treatment.

Treatment.

In dealing with the treatment of abortion, it is not the writer's intention to discuss it in detail, but merely to mention what appears to be the best methods, and when he differs from textbooks, to give his reasons for so doing. I shall divide the treatment of abortion into two sections viz: —
I. The treatment for cases before the end of the fourth month.

II. That for cases after four months' gestation. It is impossible, I think, to make the same description apply to both classes, for it is during the fourth month that the reflexa and vera unite, and that the placenta is completely formed. After the fourth month, the decidua gradually undergoes attenuation, and the later the abortion after that period, the less important they are. Up to the fourth month, an abortion is very liable to be incomplete for reasons already stated viz.: non-union of vera and reflexa, and non-development of meshwork-layers in decidua serotina beneath the incipient placenta, through which separation normally takes place in full-time labour; also, up to that period, it will not be found necessary to introduce more than a finger to hook out the product of conception. Whereas, later, it may require the insertion of the half or whole hand into the uterus, as one might have to do in removing the placenta at full term. One should, however, not make too arbitrary a distinction.
between these cases that occur before, and those that happen after four months' gestation, for authorities differ concerning the time when the above changes occur in utero, e.g., Bellett states that the decidua vera is thickest at the fifth month, while Ballantyne states that it is fully formed at the end of the first month, and begins to show atrophic changes at the third month. (Ballantyne & Essentials of Obstetric., p. 28; - Playfair, vol. i, p. 99.) Moreover, these changes are gradual and do not occur precisely at a corresponding time in every patient, and in the first section one may be dealing with cases having a placenta of no anatomical or clinical importance or an almost completely developed one, according to the length of time gestation has proceeded. I may be repeating myself, but I think it important for the intelligent treatment of a case to bear these and other facts, already stated in mind, and text-books appear to ignore them all together when discussing treatment. With regard to the case of merely threatened abortion, I have nothing to add to the ordinary routine of sedatives, mental and physical rest and perhaps minute doses of ergot or liquid extract.
of Incurable Prematurity. (Ballantyne's Essentials of Obstetrics p. 156)

Treatment of Incurable Abortion.

Before four months' gestation.

It is one's duty to look upon a case as incurable only if one can introduce his finger through the os and feel the ovaries. If there be no severe haemorrhage, there should be no undue interference, and the process should be allowed to terminate naturally, but in the great majority of cases active interference will be required to make it complete; otherwise the classical treatment was considered to be that of plugging the vagina (Ballantyne's Essentials of Obstetrics p. 156, English Manual of midwifery) which was supposed to control the haemorrhage, stimulate uterine contractions, and allow the process to go on to a successful termination without danger.

It has serious disadvantages, one of which is that it is repulsive to the woman, and if too tight, is painful, and unless sufficiently tight, inefficient in controlling haemorrhage. In any case, it permits, or even encourages, the accumulation of blood above the plug in the uterine cavity (Ballantyne), and the result of damming the effused blood may increase the dangers of intra-uterine decomposition.
Slipping both the vagina and uterine cavity is free from some of the above disadvantages (Bell, Manual of Midwifery, p. 628). If therefore, the cervical canal is sufficiently dilated to allow the ovum to pass, an attempt should be made to express it, but it will only succeed if the ovum is detached (Bell, p. 629), and even if it does succeed, it has the further disadvantage that it will probably leave the decidua in utero, and thus, according to the writer's ideas, simply produce an incomplete abortion. One is consequently forced to the conclusion that the proper and efficient treatment is the removal of the ovum, placenta (if any), and decidua by a blunt curette, or the finger, the ovum having been detached, if necessary, with forceps, or Hegar's dilators under an anaesthetic. Owing to the soft consistency of the uterine wall during early gestation, and the necessity, as the writer maintains, of separating the decidua from that wall, the finger should always be preferred for fear of injuring the uterus, or even perforating it. Moreover, the finger is more sensitive, and enables the operator to form a better opinion as to
whether the uterus has been completely emptied, and the finger will be as acceptable as the curette if rubber gloves are worn. (Bullet's manual of midwifery, p. 629.)

If a portion of the uterine contents have come away, the same line of treatment must be pursued i.e. active and prompt interference, and complete emptying of the uterus with the finger.

After four months gestation, one is now dealing with conditions very much resembling labour at full term, only on a smaller scale. Up to the end of the fourth month the decidua are of almost equal importance with the placenta, but now the latter is the all important factor in abortion, though even yet the decidua should not be entirely ignored, their importance varying in inverse ratio to the length of time gestation has proceeded.

Owing to the present increased size of the uterus, it may not be enough to introduce a finger, but a half or whole hand may have to be inserted in order to empty it of the placenta and its other contents. It may therefore be necessary to employ a hydrostatic dilator e.g. a De Ritis bag.
The ordinary instrument is of rather large dimensions for a case of abortion, and one of a smaller pattern will be found advantageous. It is not always an easy matter for the general practitioner to introduce this through an only slightly dilated os, though he is supposed to be able to do so, if there be sufficient dilatation to admit a finger (Herman) and, according to Tutherill*, the forceps Cold & Norman might be unnecessary. Judging from personal experience, these statements are both incorrect, as I consider it impossible to introduce this bulky dilator through such a narrow os, and it is always of great advantage, and sometimes absolutely necessary, to employ a forceps of some sort. Having regard to these facts, the writer has had manufactured for him, what may be described as a modified De Puezo bag. It resembles the original in nearly every respect, with the exception that it is of a somewhat smaller pattern, and contains a central curved stem made of metal which has a pelvic curve, and occupies the axis of the cavity of the dilated bag.
Near the tapering end of the instrument are two cross bars, the extremities of which are fixed to a rim of metal, which is, in its turn, attached to the inner surface of the bag. One end of the stem is fixed into the Centre of these bars, while the other, blunt end is free, and when the bag is distended, just reaches to that portion of it which, when introduced, will be in contact with the presenting part of the foetus, if the latter be not displaced.

A.

B.

A side view of the bag. (enlarged)

B. Inner view, details of tapering end of bag (enlarged)

Before introducing the bag, it is folded longitudinally, and in order to maintain it in this position, an untied thread is firmly twisted round a few times near the upper end. One end of this thread is kept outside the vagina and is gradually withdrawn after
the bag is in position, and commencing to dilate. It will be easy to withdraw the thread, for I have repeatedly had to use it with a De Ries bag, and found no difficulty. The thread untwisting itself when the bag is dilating. The writer believes that this instrument will have the following advantages over the ordinary De Ries bag:

I. The stem acts as a rigid axis for its introduction, so that no forceps are necessary.
II. It can be introduced through a smaller orifice, for there are no bulky forceps to occupy any space, and the bag is not compressed so that it bulges laterally beyond the edge of the blades.
III. When once introduced, there are no forceps to be withdrawn, and therefore no risk of withdrawing the bag.
IV. There is less risk of rupturing the membranes, for no sharp forceps blade comes in contact with them.
V. There are fewer manipulations in introducing it, and therefore less risk of sepsis.