Post Partum Hemorrhage.

By this is meant that condition which is met with as a complication occurring very shortly after delivery, either preceding or following the removal of the placenta.

As a most serious emergency, requiring immediate treatment, to be met with a clear head and a fixed purpose, it is perhaps unequalled in importance by any other obstetrical or surgical emergency.

Of late years much attention has been paid to the subject and many plans have been devised for its more effective treatment. If the progress made in this direction is better indicated by the reports of trials of methods published in the various medical journals from time to time, than by the results embodied in the various standard works on Obstetrics.

It is remarkable that all the so-called "new" remedies are to be found recommended in the old books of twenty to forty years back.

I propose to review the different plans of treatment & to point out those to which the balance of medical opinion has been favorably accorded, at the same time endeavouring to show, that while in the possession of numerous well-tried remedies, the opposition to the more general use of the injection of perchoride of iron is not wholly unfounded.
The consideration of the causes which give rise to the condition, or which favour the tendency thereto, leads us to the conclusion that much may be done in the way of prevention.

Our aim in treating the cases, from whatever cause they arise is practically the same in all: viz. to empty the uterus thoroughly and then to induce firm and permanent contraction.

The three principal causes are:
1. Inertia or atony of the muscular coats of the uterus.
2. Mucoid adhesions between the placenta and the uterine walls.
3. Irregular contractions of the uterus.

Inertia or atony of the uterus is by far the most frequent cause and depends on various conditions. It will be found common among women who are the subjects of wasting diseases, as those who are far advanced in Bright's disease, also in individuals whose strength has been sapped by frequent and rapidly succeeding pregnancies; when a labour has been tedious the vital powers must be lowered, the exhaustion consequent thereon leads to it: a too rapid labour may have the same effect, but from a different cause viz. because the contractile powers of the uterus have not been sufficiently stimulated it is called into play. This is seen when expulsion of
the child has been violent & the resistance
to its progress only slight: also in cases where
the forceps have been made to perform the
extraction in the absence of uterine pains.

Irregular contractions cause it some-
times simply on account of their irregularity: at other times because they lead to
retention of the placenta & also to partial
inversion of the uterus.

Partial adhesions of the placenta,
due to marked inflammatory processes
set up during gestation are an occasional
cause, as is also the rare condition of the
uterus being prevented from contracting
by the presence of inflammatory bands of
lymph connecting it with the other
contents of the abdomen (Irving, A. R. W. &

Besides these, certain pathological
conditions are known to give rise to
post partum hemorrhage, such as the
presence of fibroids tumors in the
uterus, polypi etc.

Apart from pathological conditions
the treatment in all cases is the same
viz: to completely empty the uterus &
induce permanent contraction.

The uterus may be in an actual
contracting condition without ensuring
immunity from flooding, in cases where
it is distended by any foreign body as
part of placenta, membranes or a clot,
& when prevented from closing well by a
distended bladder, as pointed out by
the late Dr. Johnstone Earle.
A great deal may be done towards prevent the occurrence of post-partum haemorrhage. There is no doubt that many cases are due either to carelessness, or to want of attention to details on the part of the attendant.

A deficiency in the combustible property of the blood may be a predisposing cause in anemic or flabby women. The general health should be attended to during pregnancy, and the administration of iron tonics is often indicated.

On this subject, Dr. Bassett of Birmingham, in the British Medical Journal, Nov. 9, says: After an active experience extending over twenty-five years, a careful examination of all the circumstances surrounding post-partum haemorrhage, I have arrived at the conclusion that the best method of anticipating it is to prepare the patient for her confinement by a course of medical treatment extending over a period of from four to six weeks. The basis of such treatment being the administration of iron. Salicylic acid has been given with the same idea.

The too free use of alcoholic stimulants appears to be one of the avoidable causes: this is seen mostly among the lower dependent classes, where the woman is spoiled with alcohol during the first stage of labour, and under its influence she makes violent and useless efforts, the result being that when her strength is really wanted it is found to be all expended, i.e. insufficient
incia's haemorrhage follow.

Dr. Norman Keir (Brit. Med. Journ., Aug. 7th, p. 284) has seen sixty-four cases of post-partum haemorrhage, in all of which he considers the free administration of alcohol during labour to have been the main cause.

Sometimes we know by previous experience that a woman is liable to this accident, and are able to take precautionary measures accordingly, but in the majority of cases we cannot foresee its occurrence. Vascular excitement towards the end of gestation may warn us; also if it is noticed during labour, when it is indicated by the pulse being permanently rapid (above 100) or jerking, especially if at the same time the uterine contractions are wanting in strength.

Dr. Whittle (Brit. Med. Journ., Sept. 7th) considers that by attending to the character of the pains we can always be forewarned. When the pains during labour are strong and quick, ceasing almost suddenly, the intervals between them are long in proportion to the length of the pain, haemorrhage is almost certain to occur. The uterine in these cases contracts sharply and then becomes fully relaxed. The same tendency continues after the birth of the child. Haemorrhage never occurs when this character of the pains is absent. Being able in this way to foresee the occurrence of flooding, it becomes
easy to prevent it by giving ergot at the proper period before the birth of the child, so as to alter the character of the pains, to make them longer, & the interval between them shorter.

He tells to ergot to alter the character of the pains & says that in a series of nearly four thousand labours he has only met with one case of post partum haemorrhage, that one would not have occurred, had it not happened that he had no ergot with him on that particular occasion.

This simple plan for entirely doing away with the occurrence of post partum haemorrhage appears to have answered in Dr. Whittler's practice, but has not been so successful in the hands of others.

When delivery appears to be too rapid & the resistance to the expulsion of the child only slight, we are justified in opposing the passage of the head to a slight extent, by the pressure of the fingers in the vagina, so as to call forth the contractile powers of the uterine muscle fully.

In any case the uterus should be grasped & followed well down into the pelvis as the expulsion proceeds. This should be done also in cases of extrusion by the forceps, or other artificial means, especially when the uterus does not contract coincidently.

The administration of chloroform for the purpose of effecting instrumental
delivery, tends to this event of coincident contraction of the uterus.

If the hemorrhage come on before
the removal of the placenta, no time
must be lost in getting it away. It may
be attained on account of inertia, irreg-
ular contraction, or adhesions. In general,
pressure & squeezing by means of the
method recommended by Crede’s Harvey
will suffice, but if not, the hand must
be introduced into the uterus & the
adhesions, if any, broken down: the
mere presence of the hand in many
cases is sufficient to cause contractions
which expel the hand & the placenta
together.

The irregular contractions, which
are often due to the presence of a fragment
of the placenta or its membranes, or a
clot, are overcome by the pressure &
dilatation thus exerted internally &
externally, so the uterus being emptied
we get the desired regular & permanc-
et contraction.

When the placenta is really adherent
we have to break through the adhesions,
& though working in the dark, to try
& make the artificial separation ap-
proach the natural as nearly as poss-
ible, although it has often been dem-
onstrated after death, by a section through
the placental site, that there is really
no division between the two, the placenta
& uterus being as it were, fused together.
many cases terminate with the removal of the local excitation: still more do not begin until after the placenta has been removed, so that in a majority of these cases, that the greater number of fatal effects occur.

Having then ascertained that the want of contraction and consequent hemorhage is not due to the presence of clot or placenta, if the uterus does not respond to the irritation of the hand placed in its cavity for the purpose of examination, the fundus should be pressed through the placid abdominal wall, and firm pressure be kept up: cold cloths should be applied to the abdomen, or a cold douche: the alternate application of heat and cold: the introductions of ice into the vagina or rectum, or the injection of cold water or a piece of ice into the rectum should be tried. These are all general measures, and require no special preparation or apparatus.

Cold & pressure are the remedies relied upon in most ordinary cases. Pressure may be made & kept up, by means of a well-fitting binder, properly adapted at the commencement of labour, & tightened as it proceeds: this may be supplemented by a large pad placed over the fundus, under the binder after delivery. Pressure may be maintained by grasping the uterine with both hands, or by compressing the
uterine walls between one hand outside is the skin inside the cavity of the uterus, which means it is considered that in many cases the placental area may be compressed & hemorrhage definitely caused.

Cold is only useful in an agent for treating uterine action reflexly : sudden shocks from the application of cold cloths or douches to the abdomen & vulva have the best effect, while cold injections & ice passed into the uterus & uterine are often of service. Continuous cold is useless & depressing : the skin after each shock should be rubbed dry & warm, or else the cold shocks will soon cease to have any effect.

The sympathy which exists between the uterus & the mammae has long been known & made use of, & it often happens that the simple act of putting the child to the breast will set up uterine contractions. Riplcy says : that when every means to arrest hemorrhage has failed, the only certain means which remains, consists in putting the newly born child to the breast, & he goes on to say, that he has never known the sympathetic connection between the uterus & mammae to fail, when the mother has been sufficiently conscious to know that the child was her own.

Galvanism has considerable power in causing uterine contractions. A case is reported in the Lancet (Sept. 7. p. 363) in which it effected a cure after cold pressure, cold injections & injections of
patchwork of iron had failed - no indirect current was directed through the uterus, one pole being applied over the
fundus, the other placed in the cervix. Firm contraction ensued, which remained permanent after the galvanic current
was discontinued.

It has been recommended to plug the vagina with cloths or sponges dipped in
some astringent solution, a misuse for
but the idea is very old & has quite fall-
en into disuse; however, in Baearthwaite's
"Retropect," p. 24. full directions for
plugging are given in an article by the
author, who seems to think the plan a
valuable one: - Clean out the placenta
& all clots: run the fingers up the outside
of the uterus so as to press the fundus,
pushing all folds of intestines upwards
for fear of injuring them. Pull the
fundus downwards whether it will
contract or not; then plug the vagina
right well, so that no blood can escape.
What is the result? You have the
fundus uteri well down: you have
stopped up the opening below & you
cannot have a coagulum in the
uterus much bigger than two fists.
This very coagulum acts as a plug in
the uterus, as the vessels cannot bleed
through the coagulum. You have thus
effectively plugged the vessels & can
wait, but the fundus must be pressed
all the while, lest the uterus dilate again.
In from one to three hours, remove the
plug, &c. &c. &c.

This plan however is strictly opposed
to the establishment of the two conditions
which are essential for arresting post
partum hemorrhage, viz.: the emptying
of the uterus, & the induction of per-
nant contraction. Few would be
likely to carry it out if it entailed the
constant pressure of the uterus for a period
varying from one to three hours.

The same objections apply to Dr. H. O't's
Hyatt's plan as related in the Obstet. Jour.
Sept. 77. He recommends a dilatable
bladder or balloon to be introduced into
the uterus & inflated by air or water:
the bag presses in the direction of least
resistance, without much force, suffi-
cient pressure is exerted to effectively
close the mouths of the vessels,
the hemorrhage being arrested, he then
proceeds to set up contractions by exst.
breaking the & allowing them to expel the
air or water contained in the bag.
The bag may contain iced water, it
avoids the bruising & uncertainty which
accompany the attempt to compress the
placental site between the hands.

This plan is even more feeble than
the preceding one, as the bag pressing
in the direction of least resistance would
naturally fall by the force of gravity
through the patent os uteri into the vagina.
It appears however to have the support of Dr. Chastagny who recommends it in childbirth; all obstetricians May 30. in whose employment it first for the induction of premature labour.

A modification of this method is proposed by Dr. Christie (Brit. Med. Jan. 28, p. 465) in which hydraulic pressure is sustained by means of a long tube so arranged that if contraction should occur, water is expelled, but if the contraction is not maintained, the water returns spontaneously.

These mechanical arrangements for stopping haemorrhage under the disadvantage of spoiling the many ways about it, by submerging the floor of blood without producing contraction of the uterus, in contraction solution to those means, which bring about contraction and stop the flow, or those which congregate the blood in the mouth of the vessels & produce contraction simultaneously.

Compression of the abdominal aorta has been resorted to as a means of checking temporarily the loss of blood. It was probably introduced by Sceleturph and recommended by Bandelsoend in Mem. des Acad. des Sciences, Jan. 1835.

It was his practice to maintain continuous pressure for several hours in this way, a little time may be gained during which other agents might act, & the strength of the common be restored.
by suitable nourishment. Compression is effected either by simply pressing the cord against the vertebral column through the abdominal walls as Baudelocque did, or by placing the hand inside the uterus, compressing the vessel through the posterior wall of the uterus, which was the plan recommended by Plancq. The objection to the practice consists in the fact that the source of the hemorrhage is not so much in the uterine arteries or in the venous sinuses, so that antice compression cannot have a very decided effect upon it.

Dr. Bradley, in an article in the Obstetric Journal, August, 78, p. 288, states that he gives more of these cases which he treated successfully in this way, which he considers to be of the greatest value. He claims for it:

1. The necessary apparatus is always at hand and can be immediately used.
2. If as Dr. Barnes says, the loss of life is in the loss of the last three or four ounces of blood, then if by this ready method we can prevent the loss of those three or four ounces, we are able to save life.
3. It is no wise interference with or prevents the use of application of any other remedy.
4. It is of all other means the one most directly under our control, as it is practised when the patient lies on her
back, we can observe the countermined
and also see that remedics of a stimulating
nurturing and medicinal character are
advisedly and properly administered.

The further remedies at our disposal
consist of the administration of certain
drugs internally, by the mouth, rectum
or subcutaneously, or the injection of vari-
ous solutions into the uterus.

Among the internal remedies, Opium
and Ether are the most important.

Smellie found from experience that
a small opiate given in time of labour
was the best means of preventing any
flooding afterwards.

Dr. Tylor Smith in his Manual of
Obstetrics 1885 p. 450 says: - Opium is of
very great value in the treatment of
uterine haemorrhage. It moderately
full dose of a grain to a half a two grains
of opium promotes contraction of the ut-

erus, although opiates in very large doses
alleviate uterine action. The action of opium
in excelling uterine action is of very little
importance as compared with its power
of sustaining the nervous and vascular
system after severe losses of blood. In
this point of view, priming alone or with
other a real volatile, an opiate is more
serviceable than any amount of
brandy, wine, or any other form of
nourishment.
Dr. Barnes (Obstet. Operations, p. 49) says: It is when haemorrhage has been suppressed & the system is rallying that opium is so valuable. Opium is in his opinion decidedly contraindicated while flooding is going on, as it then tends to relax the uteri; but when the object is to support the system, & to allay nervous irritability, there is no remedy like opium.

Dr. Bradford (Practitioner Feb. 27, p. 35) says: In post partum haemorrhage, one draught of Jint, opii, will rally the exhausted strength, restore consciousness, rouse the uterus to action, arrest the bleeding, when six times ten minutes in water would allow the patient to bleed to death.

Opium then is of considerable value in assisting recovery after flooding, on account of its influence on the general system, but it has no specific action on the uterus itself.

By far the best known & most reliable of oxytocics is the leaf of rye. It acts directly upon the uteri by virtue of its power of causing contraction of unstriped muscular fibre.

Dr. Brown-Lees has demonstrated that by its influence on the vasomotor nerves, it causes contraction of the vessels of the spinal cord, & through this channel there is no doubt that its specific action on the uterus is produced.
It is found that the act more certainly, the more highly developed the muscle is, it hence its action in the uterus at full term is more powerful than it is earlier in pregnancy.

It was first used for hastening labour, long before the real nature of its action was known. Dr. Bennet in the fourth edition of his midwifery (1830) relates a case of post partum haemorrhage treated with it.

It has been proved by Schatz and others that it does not increase the actual strength of the pains during labour, but that it lengthens them, tends to make them continuous, instead of intermittent.

It is usually given by the mouth in the form of a freshly made infusion, or as a fluid extract. As a preventative of post partum haemorrhage it is most valuable if given at the proper time, viz. towards the end of the second stage of labour.

As it requires from ten to twenty minutes to produce its effect, some judgement must be used as to the right time for administering it. If given too soon, there is a slight possibility of its exciting some harmful influence on the patient, but this would be purely mechanical, not physiological. If this practice were universal, Dr. Whipple thinks that flooding would almost never occur.
Dr. Score (Lancet, Nov. 11) has recommended the subcutaneous injection of a solution of Eystine, as being of special value when the immediate effect of eyst is required. In the worst cases of flooding, the whole system is in such a state of depression, that the stomach is unable to absorb the drug when given in the usual way; in less severe cases, the uncertain period which must elapse between the administration of the drug by the mouth, and its taking effect, has caused eyst to be denounced by Dr. Barnes as unreliable.

In subcutaneous injection, Dr. Score prepares a solution consisting of 24 grains of Bonnians Eystine dissolved in one dram each of Rose water, 6 Perceval 6 inject from jannum (= 2 pin of eystine) to 13, which causes firm contraction within five minutes.

It has proved thoroughly reliable in his hands, has no disadvantage if we except the formation of a hard black lump at the seat of injection, which may be avoided by inserting the needle deeply into the substance of the muscle.

Dr. Ashe (Lancet, Apr. 26, p. 507) has used the intranumerous injection of a solution of eystine with great success. To first clean out the conjunctiva, inject cold water, then as quickly
as possible subjects a twelve per cent solution of ergotine. The uterus contracts instantly with no ill after effects and the injection does not appear to cause any irritation. That ergot locally applied has any influence on unstripped muscular fibre has never been demonstrated, and I am inclined to attribute the good effects of this form of treatment to the vehicle employed: viz. cold water.

Prof. Simpson (Edin., Monthly Jour., May, 1876) says: The subcutaneous injection of ergotine sets up uterine action, with such speed, such certainty, such safety, that the hypodermic syringe will be found an indispensably part of the furnishing of every obstetric bag.

Ipecacuanha when taken internally has been credited with considerable power in controlling uterine haemorrhage. It is an old remedy, and will be found mentioned in Tilts, Handbook of Uterine Therapeutics p. 407; also in Lawvere Obstetric Aphorisms (1856).

The administration of large doses of ipecacuanha internally by the mouth or rectum has been found empirically to be of much service in checking haemorrhage of all sorts. In Tilts’ Handbook of Therapeutics it is stated, that in uterine haemorrhage from the stomach, arising from
chronic ulcer, etc., in from the intestines.

When there is ulceration in typhoid fever,
few remedies are more successful than
Io mentorine in frequent doses of 5 to 10 minims.
No explanation of its action is attempted
although in these cases it would appear
to be local. It readily passes into the
blood, can soon be detected in the
urine to which it gives an odour of
violet. In bleeding from the lungs.
no., kidney, bladder & uterus, one
dose every 3 hours is efficacious.

Given internally after surgical operations, it is useful when there
is any tendency to secondary hernia.

As a remedy in post partum haemorrhage it is given in doses of half a
ounce beaten up with an egg.

Dr. Rolland of Paris has advocated this plan of treatment very
strongly at different times in the Brit.

Med. Journal. In the first case which
he relates, several cold injections had
been used without effect, & the patient
was cold & almost pulseless. Half an
ounce of spirit of turpentine was
given, beaten up with an egg, in
less than five minutes the uterus
was firmly contracted & the case
proceeded to recovery.

Dr. Clutton in the same Journal
gives four cases in which the same
treatment was successful.

In these
no agent was used at all & cold was the only auxiliary employed.

If it acts in the uterus only after entering the blood it must be absorbed with extreme rapidity, as it appears to act within five minutes of being swallowed, but even then is a long time to have to wait in the majority of cases.

One great objection to it is that it is very apt to cause vomiting & so not to be retained sufficiently long to be of any service. It is used hypodermically on account of its bulk & irritant properties. To prevent nausea, it is sometimes given emulsified with powders & frigacourt.

Dr. Bristow mentions two cases in which it was injected into the uterus with successful results.

I have not been able to find any case recorded in which turpentine has been applied directly to the inner surface of the uterus itself, but from the analogy existing between the condition of the uterus after delivery & the condition of infected parts in the stomach & intestines, there seems to be no reason why the direct application should not have as good an effect in the one case as in the other.

Broom is credited with having some direct influence on the uterus, & has recently been used by the
Injections of fluids of various kinds into the cavity of the uterus have long been used for the purpose of checking hemorrhage. Probably the injection of cold water simply, or iced water is the oldest. Dr. Rusher (Brit. Med. Jour. Nov. 73. p. 601) advocates the use of cold water injected first into the uterus as being absolutely free from danger of so far as to say that the virtues of perchloride of iron are mainly due to the vehicle used, viz: cold water.

Dr. James Allibone on the other hand looks upon the procedure with dread.

Vinegar will be found recommended as an injection in Professor Davis' Obstetric Medicine (1836) p. 1065, where he says: 'The principal chemical irritant usually employed for the subjection of uterine hemorrhage after delivery, is an injection made with one part of vinegar to two of water conveyed into the uterus by means of a syringe, which, according to the testimony of some of the most respectable members of the profession in our own country, must be possessed of considerable power to suppress flooding...
The injection of alcohol was recommended by Pasta, a spirit curet by Rigby. I was for upwards of fifteen months assistant to an old practitioner in Berkshire of thirty years standing, who had never lost a case from post partum haemorrhage out of over three thousand cases of midwifery, who relied solely upon this method of treatment.

His plan was, by means of a Jeffersonian syringe, with an internal tube attached, to inject from one to two ounces of undiluted Brandy up to the fundus, after having cleared away all clots etc. In case of a syringe not being at hand a sponge in a handkerchief soaked in Brandy, was passed up so as to reach the fundus, answers the same purpose.

The haemorrhage is at once stopped & the uterus contracts firmly; but further than this, the pulse improves & so does the general condition. Probably, some of the alcohol is absorbed as it does not act in the same way as the iron solution does, viz: by forming clots at the mouth of the vessels, by simply exciting inflammation.

If much of the general improvement is due to absorption, the injection has a double value, as it is free from the disadvantages which attend the administration of stimulants by the mouth, viz: increased circulation, hearts ac. loss, or renewed loss of blood.
Any of the ordinary spirits in use will answer the purpose, or dilute spirits of wine. I have frequently seen this plan adopted & have used it myself. I have many medical men in this neighborhood who rely solely upon it. It has the advantage of being free from risk. It is cleanly, causes no obstruction of the bladder.

Iodine. Dr. Parke of New York has drawn attention to the use of a solution of Iodine, consisting of one part of the tincture to two of water, injected into the uterus, as a safe & powerful excitant of dormant reflex action. The clinical data he gives do not show its superiority over iron, but prove it to be a valuable hemorrhagic.

In 1871 (Bull. de Therap.) M. Duperrier collected twenty-four cases in which it had been used successfully without any accident. He recommends that half an ounce of the tincture be used. Dr. Mathews Bercun prefers this to the more risky injection of iron.

40% Water. The injection of hot water into the uterus is a plan of recent origin. It was introduced into this country by Dr. Stone & Hall, to whom notice it had been brought by a letter from Dr. T. S. Whistler of San Francisco, states
employed injections of water at a temperature of 110° Fahr. in 1835.

He claims for it (Lancet, June 70, P. 920)

1. It is easily attainable at all times.
2. It is absolutely safe if care be taken to exclude air from the syringe.
3. It stops hemorrhage, not by artificially plugging the vessels, but by causing a natural contraction of the uterus.
4. It is cleanly, & a disinfectant such as carbolic acid can be easily added to it.

By imparting heat, it rouses the exhausted patient, & gives power to the muscles for contraction, instead of as in the case with cold water & ice, obstructing what little heat remains & becoming a paralyzing them.

In consequence of this communication, Dr. Arbuthnot laid the plan at the Rotunda Hospital. Particulars of the cases have been published at different times, & the results have been very good.

In the Obstet. Journal, May, 70, P. 126 he says that the injection of hot water powerfully stimulates the uterus to contract, & thus rapidly checks the hemorrhage, but that it does more is clearly established; it evidently acts as a general stimulant. The effect on the pulse is most marked, it becoming stronger & slower immediately after the injection; indeed the pulse is affected more rapidly than after the hypodermic injection of ether.
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as does not flag afterwards. The pain of the
patient too low the deadly true that they have
previously worn, last, not least, they
express themselves as having experienced
the greatest relief I obtained great comfort
In the lancet (Feb. 78. p. 196) he says,
we do not as a rule employ hot water
in cases of post partum hemorhage,
until the application of cold has failed
to arrest it. It is most beneficial in the
case of weakly delicate women, or in
those in whom profuse hemorhage hav-
ing been checked, blood continue to be
lost in small quantities, the uterus alter-
nately contracting and relaxing. In its suc-
cessful application the tube must be
inserted firmly into the uterus & the fun-
culus well bathed. The temperature of
the water must not be under 110° Fahr.
may safely be used up to 115°.

The advantages of warmth in pro-
Imparting uterine contraction had been
previously recognized in some steps.
Tyler Smith (Manual of Obstetric 1838.
p. 468) says: With respect to the mode
of using reflex action for the arrest of
hemorhage, it should be mentioned
that cold & heat alternately are more
efficient than cold continuously ap-
plied, even when we inject into the ut-
erus itself. On this principle, I have
sometimes injected warm & cold water
alternately into the uterus with the
best effect.
Dr. Attwell (Obstet. Journ. May 7th, p. 126) mentions a case in which cold internally and externally had been applied without avail, the patient being cold and pulseless, with blood still trickling from the uterus, in which the simple application of warm jars to the extremities so as to restore heat to the body had the effect of speedily stopping the hemorrhage.

Further experience has shown that the injection of hot water is not such a reliable remedy as it was thought to be at first. In a discussion on the subject at the Brit. Med. Assoc. at Cork in August 79, Dr. Waller reported eleven cases. The temperature of the water used in these ranged from 110° to 120° Fahr. In all except one, relaxation and dilatation of the entire uterus followed the injection. If contraction occurred, it was but temporary; when the temperature did not exceed 104° Fahr. the uterus contracted without after wards becoming paralysed.

Dr. Attwell said that the failure was due to the excessively high temperature of the water used, as in his hands the injection had not been followed by paralysis.

As the result of the discussion, the conclusion was come to, that we do not yet know the conditions under which the injection of hot water may be relied on for inducing contraction and checking hemorrhage.
The application of styptic salts of iron in solution as an injection into the uterus is not an absolutely new procedure, but was originally used by Dr. Stimpson & Kinzcher, who about thirty years ago strongly supported this method of treatment.

In this country it has been mainly advocated by Dr. Barnes, & he appears to think that cold + styptic are the only reliable agents we possess.

The choice between the two depends upon our appreciation of two entirely different physiological conditions: styptic will act when cold will not: upon this the rest is the justification for using this plan of treatment. So long as cold acts it should be used: when it fails, iron must be used which will not fail: each has its use & each must have its turn.

At one time it was his habit to wash out the uterus with iced water as a preliminary to the use of the iron injection, but now prefers not to do this, on the grounds that at the period when this latter is indicated, the exhaustion of the patient is generally so great that the injection of cold water is ill-begun. It often under these circumstances the injection of cold water is more likely and near than the injection of an iron solution. (3rd. Ed., p. 472). In all cases of injection into the uterus, the danger of shock must be remembered.
There are three stages of post-partum hemorrhage to deal with.

(1) When there is actual contractility of the uterine. Here the diastatic function may be relied on. Excipients of contraction are useless. Our reliance must be upon the direct application of styptics to the bleeding surface.

(2) A stage beyond the first when contractility is seriously impaired or even lost. Here excipients of contraction are useless. Our reliance must be upon the direct application of styptics to the bleeding surface.

(3) The stage beyond the first two, when not only contractility, but all vital force, is spent, when no remedy holds out a hope unless it be transfusion. Even this may probably be too late. (ib. p. 474)

His directions are as follows:

Take a Stippson's syringe, to which is connected a nutrient tube 9 or 10 inches long. Place in a deep basin 3 iv of the strong liqor Zuni Perchlo. of the B. P. with 3 iv of water, a dissolute 3/4 of the solid perchloride of persulphate of iron in 3 iv of water. Pump through the delivery tube five or six times to expel the air. Then ensure filling the apparatus with the fluid. Then pass the delivery tube into the uterus so that its end touches the fundus. Then pump gently and slowly. The styptic fluid will thus bathe the whole inner surface of the uterus. Care must be taken that a free exit be allowed for the escape of the fluid. A few strokes will
often suffice, & the operation must be dis-
continued as soon as the effect is noticed.
The haemostatic effect is produced
in three ways.

1. There is direct action in constricting
the blood in the mouths of the vessels.

2. It acts as a powerful astringent on the
inner membrane of the uterine, simply
corpuscule the surface & thus constring.
ing the mouths of the vessels.

3. It often provokes some amount of con-
tractile action of the muscular wall.

Dr. Atwill was at one time a great
upholder of this practice. In the Brit. med.
Journ. Nov. 30, p. 620 he says: I believe the injec-
tion of perchloride of iron to be not only a
justifiable, but in general, a safe mode of
treating seven cases, & that it, in the case
of some similar stoppage can alone be relied
on in severe cases. He used four or five oz.
of a solution of one part of perchloride to
two of water. He mentions one case in
which the bleeding was instantly stopped
but death occurred from pyrexia in 5 days.

All authorities seem to be agreed as
to the great efficacy of the remedy, but
there has been great opposition to the prac-
tice on account of its acknowledged risks.

In some cases it has entirely failed
in its purpose. M’Clintock, in Syd. Soc’s., Ch.
of Smellick Brindly, vol. I. p. 396 says: Although
I have seen two cases where the perchloride
injection entirely failed to stop the hem-
orrhage, both patients bleeding to death,
still I regard it as a most powerful agent for stopping hemorrhage in these cases.

Dr. Snow Reed (J. Med. Iowa, Feb. 74) says:—
The danger in the use of these agents is shown by the number of fatal cases which have occurred, appears to consist in only partial contraction having been produced, by which, although the hemorrhage was arrested, yet the veins & sinuses remained open, & permitted the pericloride to be taken up & conveyed into the general system; symptoms of blood poisoning supervening in a few days, ending almost invari-ably in death.

Dr. Leibermann (Sept. of Med., 16, p. 468) says:—
The action of such powerful agents is looked upon by most practitioners with considerable apprehension. Nothing is more unjustifiable than such a proceeding, unless in the first instance every other means have been tried & been failed. But viewing the operation in the light of a desperate remedy, we are warranted in cases of emer-gency in availing ourselves of this method of treatment.

This fairly represents the general feel-ing on the subject, viz:—that it is only to be used as a last resource, & that even then, the risk is so great as almost to counterbalance any good that may result.

Many men go so far as to say that cases never do occur which actually demand its use, or that they have never had any difficulty in arresting bleeding by the
ordinary means, i. e., that therefore injection of pithchloride is needless.

So then Dr. Barnes replies, that there is a certain class of cases in which the ordinary means are quite useless, i. e., that they have had the good fortune never to meet with cases of this class.

In the Brit. Med. Jour. Sept. 27. p. 369, he relates what he calls a "typical case." Post partum haemorrhage was expected & every precaution was adopted. The hand never left the uterus until long after the expulsion of the placenta. In spite of all precautions, such as the subcutaneous injection of hypodermic & continued pressure, haemorrhage occurred. The subcutaneous injection of burnsley, the injection of warm water into the uterus, & the injection of a solution of iodine into the uterus were tried in succession, but all failed. The patient was now blind, pale, pulseless & the uterus was almost in extremis. The pithchloride was then injected & the haemorrhage at once ceased. In half an hour afterwards the patient took refreshments & she made a good recovery. But in the iron she must have died, & it was in such cases as these that he advocated its use.

This bears out the great argument in its favour, viz., that it will most assuredly check haemorrhage when nothing else will & we have no choice between using it or its risks, & seeing the patient bleed to death before our eyes.
The sources of danger appear to be:

1. That some of the injected fluid may penetrate into the circulation so cause thrombi in the blood vessels or heart.

If the uterus contracts thoroughly and permanently this cannot happen, as thrombi are formed instantly at the mouths of the vessels, which prevent the circulation beyond; when there is subsequent relaxation, there is undoubtedly fear of embolism.

Several cases are recorded in which, the injection of a few drops of the perchloride into a vein has been followed by sudden death. In these it was found that the muscle had pierced a vein, the perchloride thus reached the heart directly, a thrombus formed which reached it later.

2. That air be carried into the uterine sinuses and thence to the heart.

This danger is of course common to the injection of all kinds of fluids, and in all cases preventible. Dr. Attie has known perchloride cause instant death on injection, but has also known the same result arise from simply squirting the vapors with water, air being entered the uterus, & ensuing whether the cause of death in both cases might not have been the same.

3. That some of the injected fluid may run along the Fallopian tubes & escape into the peritoneal cavity.
A case probably of this nature occurred in Dr. Barnes' practice, in which the injection was immediately followed by severe pain in the hypogastrium, with death in seven hours.

Dr. Beck (Brit. Med. Jour. March 74, p. 301.) describes the appearances found in several cases in which he had the opportunity of making examinations after death from the injection of perchloride.

The cases had gone on well till about the third day, when symptoms set in which ended fatally at the end of two to four weeks. The organs of the body generally were found to be healthy; intestines distended with flatus; peritoneum slightly injected, with perhaps a little effusion into the peritoneal cavity. Uterus large and slightly firm; the serous membrane less filled with an inhallow black coloured fluid, which from its similarity to the secretion on the inner uterine surface, leaves no doubt that some of this fluid had entered these canals through the open orifices: as fluids are known by experiment to pass readily from the venous canals along the uterine sinuses & escape at the inner surface of the uterine, it is not unreasonable to suppose that fluid at the inner surface have followed a contrary course (caused by inspiration) being then conveyed into the general system, producing blood-poisoning & death.
The uterine tissues were found in a perfectly healthy state.

A similar circumstance of eventual post-morbid appearance occurs in the ordinary prepartal sepulchral conditions, due to the absorption of purulent secretions from the uterus. These secretions are probably rendered more noxious by the addition of the iron, although this usually has the credit of being anti-septic. There is an acknowledged tendency to pyemia, sepulchralia, phlebitis, & peri-tonitis; after excessive losses of blood especially during parturition, so the causation of these may sometimes be erroneously attributed to the iron injection.

It not unfrequently happens that by the time we have got the uterus to contract, & stopped the flooding, that the patient has lost so much blood that she remains in a state of collapse, & further measures are required to restore vitality.

Dr. Barnes describes a typical case in the Lancet Jan. 74: - The vomiting of beefed wine etc., in an unchanged state from the stomach shows that the vital power is so low that there is no hope of replacing the loss of blood by means of absorption. The rapid & laboured respiration, shows the want of oxygenated blood; air goes in & out of the lungs, but has not blood to act upon. & its only effect is to accelerate the cooling of the body. When things are at this stage, extreme exhaustion, fever &
imperceptible pulse, rapid laboured breathing in response of the system to medication, a stimulant given by stomach and rectum, with vomiting and great agitation, direct injection into the vessels is indicated.

Blood may be used whole or defibrinated, according to circumstances, as with Bell's apparatus we can have transfusion direct from arm to arm, so that the blood is neither exposed to the air nor allowed to rest. Defibrination is required in the indirect method when there is no proper apparatus at hand. Saline solutions may be used to dilute or supplement the blood used, useful not only for their chemical properties, but also for their physical qualities in supplying a bath of fluid on which the heart's blood vessels can act more effectually.

Raising the limbs at right angles to the body so as to throw more blood into the centre of circulation has long been known and employed in collapse.

Under the title of autotransfusion, Dr. Goldschmidt of Berlin describes a case in which both lower limbs were firmly bandaged, with the effect of improving the pulse and general condition. Owing to the pain they caused, the bandages were removed and collapse and death at once followed.

This plan was first proposed by Prof. Müller of Berne. It is worthy of consideration as a preliminary step to transfusion when this latter is really indicated. Its performance
in the interval may save valuable time, and often be the means of preventing the more serious operation from being too late to do any good. The removal of the bandage afterwards should of course be very gradual.

The subcutaneous injection of ether has a wonderful effect in rallying the system when collapsed. Prof. Haecker (med. Presse cire, May, 76) directs that \( \frac{3}{4} \text{ to } 3 \text{ iv} \) should be used at short intervals, the needle being inserted deeply into the subcutaneous muscles. The effect is transitory, however, and the operation painful, requiring frequent repetition, but it may serve to support life until transfusion can be performed, or may even render that unnecessary.

The full consideration of this subject leads us to the conclusion that so much can be done in the way of prevention and treatment of post partum hemorrhage that deaths from this cause ought to be reduced to a minimum; with this view, everyone ought to carry in his own mind a clearly-laid-out plan of action, to be adopted in every case.

In the first place it would be well to conduct every case with as much care and precaution as we should one in which we knew from experience that flooding might be expected.
We do not always have the chance of putting our patients beforehand into a sort of training for the coming event, but when we have the chance, attention to diet, exercise etc. should not be neglected. In a case where labour should be called for.

When labour begins, we should take care that the patient is not encouraged to exhaust her strength in useless efforts during the first stage, so the membranes must not be left too long unruptured.

In the second stage rest must be judiciously given towards the end, & the application of the forceps not delayed until the strength is gone & the contractile power of the uterus lost.

The uterus is to be followed down with the hand, & allowed to expel the body & legs of the child, without any interference on the part of the attendant.

If the pains of expulsion have separated the placenta, the next contraction will generally leave it in the vagina, where it may be gently extracted. If this be not so, compression by Credi's Harway method will be effected, unless the placenta is retained by irregular contraction or adhesion, in which case the hand must be carefully inserted into the uterus & extraction completed; the same procedure forms part of the treatment when required in the course.

If after the removal of the placenta insertion of the hand, & compression fail
to procure circulation, the various modes of exciting reflex action must be tried, cold, salvarsan etc. Any internal remedies, such as quae, opium & laudanum must be given at an early stage to be of any service. The application of cold may be followed by the application of warmth or warm water injections substituted for cold. Brandy, coding or vinegar may, must be injected. But if these fail, no time must be lost in resorting to the injection of parahydrochloric acid.

After the haemorrhage has been stopped attention must be directed to the condition of the patient, who will frequently have retained the power to rally. In spite of small quantities of nourishment & stimulants given by mouth & rectum, or the subcutaneous injection of ether, the collapse remains profound, transfusion must be performed.

By these means we may often be able to prevent dangerous losses of blood, or to restore those to life who are in imminent danger from such losses.

A. H. Boucher

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April 15th, 1880.